



San Francisco Bay Area Water Trail Plan Draft Revised EIR



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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This executive summary provides an overview of the Draft Environmental Impact Report (DEIR) for the San Francisco Bay Area Water Trail (Water Trail, or WT) Plan, including the environmental analysis, impacts and mitigation measures. Detailed information regarding the proposed WT Project and potential issues associated with implementation of the WT is provided in Chapters 1 through 5 of this DEIR.

ES.1 INTRODUCTION

The San Francisco Bay Area Water Trail (Water Trail, or WT) strives to create a network of access sites, or “trailheads,” that allow people in small, non-motorized boats, such as kayaks, canoes, sailboards, and dragon boats, to safely enjoy the historic, scenic, and environmental richness of San Francisco Bay through single and multiple-day trips on the Bay. The Water Trail would bring education about personal boating, navigational safety, and appropriate boating behavior near sensitive wildlife species and shoreline habitat to the boating public through a variety of means. The majority of the 112 trailheads proposed for designation as part of the network already exist and are used by the public. They are located along the shoreline of the nine San Francisco Bay Area counties.

The WT was authorized by the San Francisco Bay Area Water Trail Act (Water Trail Act), signed into law in September 2005. The Act directed the San Francisco Bay Conservation and Development Commission (BCDC), in coordination with other agencies and organizations, to conduct a public process to develop the San Francisco Bay Area Water Trail Plan (WT Plan), and assigned the California State Coastal Conservancy (SCC or Conservancy) to be the lead agency for implementing the Plan. The development of the WT Plan was led by BCDC, with the active participation of a broad-based steering committee, stakeholders, and experts on specific topics. All background reports, meeting notes, and the final draft WT Plan itself are posted on BCDC’s website at www.bcdc.ca.gov.

The SCC is the Lead Agency under the California Environmental Quality Act (CEQA). This document is a Programmatic EIR (CEQA Guidelines Section 15168) in that it analyzes the potential regional and cumulative effects of implementing the WT Plan rather than analyzing the impacts of any particular site-specific project. This DEIR identifies mitigation strategies and measures applicable to general types of potential impacts that may occur from implementation of the Water Trail Plan, including possible trailhead enhancements or the development of new access sites. This approach allows for efficient tiering of subsequent project-level CEQA documents. A DEIR was previously issued for this project on June 12, 2008 and a total of 24 agencies, organizations and individuals provided comments. Those comments were considered in the development of this recirculated DEIR. More detail on the CEQA review process is provided in Chapter 1, Introduction, and Chapter 2, Project Description.

ES.2 PROJECT DESCRIPTION

The San Francisco Bay Area Water Trail project would implement the Water Trail Plan through a trailhead designation process designed to support improved and safer non-motorized small boat access to San Francisco Bay, and protection of environmental resources through careful

consideration of potential impacts related to implementation of the Plan. The WT Plan (BCDC 2007b) includes trailhead development and management strategies, organizational structure and responsibilities, a trailhead designation process, and guidance on trail planning and program development. The Plan's trailhead development and management strategies promote boater outreach and education; appropriate trailhead location and facility design; and maintenance and operation plans. The WT Plan is a guide to trail implementation for agencies and organizations that will develop and manage the WT program as well as for site owners and managers interested in becoming part of the WT and other stakeholders from around the region.

Of the 112 potential "Backbone Sites" identified in the Water Trail Plan, a subset of 57 were identified as "High Opportunity Sites," meaning that they would need little more than educational signage to meet the criteria for inclusion in the Water Trail Project. Additional access sites may be considered for designation in the future, as appropriate, following the same evaluation procedures as for the sites identified in the Water Trail Plan. Access site improvements may range from signage only to development of entirely new access sites. Typical facility improvements may include, as examples, new docks, ramps, boat storage facilities, parking improvements, and restrooms. Official inclusion of access sites into the Water Trail Project ("trailhead designation") would be accomplished through evaluation of site characteristics and management ("Site Descriptions" for High Opportunity Sites and more elaborate "Trailhead Plans" for all other sites) for each site and decisions would be made at public meetings. The implementation process for the project is described in detail in Chapter 2, Project Description.

The analysis of potential environmental effects associated with implementation of the WT Plan is based on the increase in non-motorized small boat use that could be caused by the Water Trail. To accomplish this first step in the analysis, the potential increase in non-motorized small use needs to be defined. The analysis begins with an examination of existing levels and future increases that would be expected to occur without implementation of the Water Trail (i.e., the non-WT-related growth), and then assesses the elements of the WT that could lead to additional (incremental, WT-induced) growth in NMSB use. The analysis then evaluates the various potential impacts that might be associated with WT-induced growth.

Existing levels of non-motorized small boat use are estimated based on data collected by the California Department of Boating and Waterways in 2006 and 2007 (Cal Boating 2009). Likewise, estimates of the growth of non-motorized small boat use absent the Water Trail are based on the Cal Boating 2009 study. There are neither published estimates (e.g., from local studies or surveys), nor other sources of data to estimate the increment of future growth in non-motorized small boat use on San Francisco Bay that might be attributable solely to the Water Trail. Based on input from recreational experts, this unknown increment is expected to be very small in relation to non-WT-induced growth. This conclusion is based on the challenges of boating on San Francisco Bay (weather, currents, tides, water temperature), the interest of most access site owners/managers in maintaining or improving their sites regardless of the WT (50% of the Backbone Sites are within waterfront parks, for example), the publicity for non-motorized boating on the Bay that already exists, the opportunities for non-motorized boat rentals that already exist, the interest of Bay Area boat owners in recreating on water bodies outside the Bay Area (lakes, rivers, coastline), combined with the already predicted increase in non-motorized

small boat use regardless of the WT. An annual growth rate in the use of non-motorized small boats by people in the San Francisco Bay Region of 3.84% per year is predicted absent the Water Trail (Cal Boating 2009).

The number of participant-days¹ for non-motorized small boat use by individuals residing in the San Francisco Bay Area Region, as defined by Cal Boating (2009), and not including inflatable rafts, is estimated to be 6.2 million in 2010, based on 5.3 million participant days in 2006 and an estimated total of 174,000 non-motorized small boats owned by people from this region in 2006.² The number of motorized boats owned by residents of the San Francisco Region (Cal Boating 2002) has been roughly equal to the number of non-motorized small boats owned in the region and used in the region over the past 10 years.

ES.3 ALTERNATIVES

The DEIR considers the following three alternatives to the Project.

- **Alternative 1 — No Project:** The No Project alternative assumes continued public use of existing sites without any educational/public outreach programs or support for site improvements other than what already exists.
- **Alternative 2 — High Opportunity Sites (HOS) Only:** The HOS Only Alternative would include only the sites that meet HOS criteria. (While the number of sites meeting HOS criteria is not known with certainty, 57 sites were preliminarily identified as HOSs in the WT Plan.) Under this alternative, only sites with minimal improvement needs and no significant management issues would be included in implementation of the Plan. All mitigation measures applicable to the Project would also be incorporated into the HOS Only Alternative to the extent they would apply to this subset of sites.
- **Alternative 3 — Enhanced Water Trail Plan Alternative:** The Enhanced Water Trail Plan Alternative includes four additional strategies to further reduce potential impacts associated with implementation of the WT. Under this alternative the existing WT Plan (BCDC 2007b) would be modified to incorporate four additional strategies: Strategy 25, Comprehensive Education Program; Strategy 26, Navigational Safety; Strategy 27, Boatwashing Facilities; and Strategy 28, GHG Best Management Practices for Construction, Trailhead Operation, and WT Program. All mitigation measures applicable to the Project would also be incorporated into the Enhanced WT Plan.

Alternatives Considered and Rejected. Other potential alternatives, including site closure, no major new facility development, carbon-neutral, or limited geographic region alternatives, were considered and rejected as being infeasible for reasons discussed in Chapter 5, Alternatives to the Project. The most broadly applicable reasons for their rejection are the non-regulatory nature of the WT project and the directive of the WT Act to serve the entire nine-county Bay Area.

¹ Participant-days are the number of days a boat owner uses his or her boat. A boat owner using a boat three days per year would have three participant-days; a boat owner using a boat 30 days per year would have 30 participant days. The average non-motorized small boat use rate is 24 days per year statewide (Cal Boating 2009).

² This number excludes inflatables, which are used only on interior lakes and rivers, and make up 41.5% of non-motorized boats owned by California residents.

Environmentally Superior Alternative. The Enhanced Water Trail Plan Alternative was determined to be the Environmentally Superior Alternative.

ES.4 SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATIONS

The DEIR identified potentially significant impacts on: recreation; navigation; aesthetics; biological resources; cultural resources; hydrology and water quality; and traffic, circulation and parking. Mitigation measures identified in the DEIR would reduce all of these impacts to a less than significant level. The Project would not result in any significant irreversible effects. The Project's contribution to cumulative impacts and growth inducement also would be less than significant.

Table ES-1 presents a summary of potential project impacts. The level of significance of each environmental impact is listed both before and after the application of the mitigation measure(s) identified in this DEIR. For detailed discussions of all project impacts and mitigation measures, please refer to the environmental analysis in Chapter 3 of this DEIR.

This DEIR provides mitigation measures for all potentially significant impacts, including the project's potential contribution to cumulatively significant impacts. Mitigation measures may apply to regional impacts (i.e., impacts associated with the implementation of the WT as a whole) or site-specific impacts. Potential regional impacts will be mitigated through activities undertaken by site owners and managers, and/or as part of the trailhead designation process. Potential site-specific impacts will be mitigated for each site individually. The need to implement the mitigation measures identified in this DEIR is dependent on the degree and type of development proposed for the site, the potential for that development or publicity to substantially increase use of a site, and the location of a site in relation to sensitive wildlife species and habitat and/or potential safety concerns.

Sites meeting HOS criteria have less than significant impacts and therefore would require little or no site-specific mitigation. The applicability of the various site-specific mitigation measures to individual sites would be evaluated during the trailhead designation process. Because site conditions may have changed since the original classification of potential WT access sites into HOSs and non-HOSs was made, all sites will undergo a preliminary environmental screening as part of the trailhead designation process. The environmental review would consider available CEQA documentation for the site, and would use the environmental effects checklist included as a preliminary draft in Appendix E of this document. Although the mitigation measures included in this document are expected to be adequate for the great majority of potential WT sites, site-specific CEQA review would identify the need for any other mitigation measures that may not be included in this document.

TABLE ES-1. SUMMARY OF POTENTIAL IMPACTS AND MITIGATION MEASURES

Impact Number	Impact Name	Significance Before Mitigation	Mitigation Number	Mitigation Name	Significance After Mitigation
Rec-1	Regional Effects on Recreation	LTS	N/A	N/A	N/A
Rec-2	Increased Use of Existing Sites or Other Recreational Sites Causing Accelerated Physical Deterioration of the Facility or Substantial Unplanned Expansion	LTS	N/A	N/A	N/A
Rec-3	Increased Use of WT Sites by Motorized Boats from Implementation of the WT Program	LTS	N/A	N/A	N/A
Rec-4	Conflict with, and Preclusion of, Existing Recreation Activities Due to Facility Improvements and Use of WT Sites, or Increased Boating	PS	Rec-M4A	Web-Based Comment Form	LTS
			Rec-M4B	Conduct Recreational Use Evaluations and Develop/Implement Adaptive Management Recommendations if User Conflicts Occur	
			Rec-M4C	Safety Signage	
Nav-1	Increased Risk of Incidents Including Accidents Involving Loss of Life, or Collisions between NMSB Users and Other Boats	PS	Nav-M1A	Develop and Implement Safety Signage	LTS
			Nav-M1B	Sponsor WT Training and Education Programs	
			Nav-M1C	Design of WT Sites near Commercial Shipping and Ferry Terminals	
			Nav-M1D	Planning of Wildlife Buffer Zones	
Nav-2	Increased Risk of Incidents Due to Changes in Facilities or New Sites	LTS	N/A	N/A	N/A

TABLE ES-1. SUMMARY OF POTENTIAL IMPACTS AND MITIGATION MEASURES

Impact Number	Impact Name	Significance Before Mitigation	Mitigation Number	Mitigation Name	Significance After Mitigation
PS-1	Need for New Facilities or Substantial Increase in Demand for Public Services	LTS	N/A	N/A	N/A
PS-2	Substantial Expansion of Public Service Needs for Sites Designated for Overnight Use or Unacceptable Increase in Service Ratios, Response Times or Other Public Service Performance Objectives	LTS	N/A	N/A	N/A
Aesth-1	Degradation of Visual Quality of a WT Site or Its Surroundings	PS	Aesth-M1	Include Visual Characteristics and Site Relationships in Design Guidelines and Trailhead Plans	LTS
Aesth-2	Degradation of a Scenic Vista or View from an Eligible State Scenic Highway	LTS	N/A	N/A	N/A
Bio-1	Spread of Non-Native Invasive Plants	PS	Bio-M1	Conduct Education and Spread-Reduction Efforts	LTS
Bio-2	Wetland Habitat Impacts Due to Construction, Repair, Rehabilitation, or Maintenance of Trailheads	PS	Bio-M2	Conduct Surveys, Adopt Avoidance Measures, and Instigate Compensatory Mitigation	LTS
Bio-3	Wetland Habitat Impacts Due to Increased Trampling of Wetland Shoreline Vegetation and Soil	PS	Bio-M3	Establish Trailhead Restrictions, Public Education, Surveys, and Signage	LTS
Bio-4	Impacts to Special-Status Wetland Plant Species	PS	Bio-M4	Conduct Surveys, Adopt Avoidance Measures, and Instigate Compensatory Mitigation	LTS

TABLE ES-1. SUMMARY OF POTENTIAL IMPACTS AND MITIGATION MEASURES

Impact Number	Impact Name	Significance Before Mitigation	Mitigation Number	Mitigation Name	Significance After Mitigation
Bio-5	Disturbance of Rafting Waterfowl from Roosting and Foraging Habitat	PS	Bio-M5	Avoid Disturbance of Rafting Waterfowl from Roosting or Foraging Habitat	LTS
Bio-6	Disturbance of Wading Bird, Shorebird, and Brown Pelican Roosting and Foraging Habitat	PS	Bio-M6	Avoid Disturbance of California Brown Pelicans From Roosting and Foraging Habitat	LTS
Bio-7	Disturbance of Bird Nesting Habitat	PS	Bio-M7	Avoid Disturbance of Bird Nesting Habitat	LTS
Bio-8	Disturbance of California Clapper Rails and California Black Rails	PS	Bio-M8	Avoid Disturbance of California Clapper Rails and California Black Rails	LTS
Bio-9	Disturbance of Non-Listed Marsh Birds	LTS	N/A	N/A	N/A
Bio-10	Potential Incidental Take of Sensitive Species	PS	Bio-M5 through Bio-M8	See Mitigation Names for Bio-M5 through Bio-M8, above	LTS
Bio-11	Disturbance of California Clapper Rails and California Black Rails due to Construction Activities at Launch Sites	PS	Bio-M11	Avoid Disturbance of California Clapper Rails and California Black Rails due to Construction Activities at Launch Sites	LTS
Bio-12	Regional Impacts on Special-Status Small Mammals of Bayland Marshes	PS	Bio-M12, Bio-M3, and Bio-M4	Undertake Avoidance Measures	LTS
Bio-13	Regional Impacts on Northwest Pond Turtles	PS	Bio-M12	Undertake Avoidance Measures	LTS

TABLE ES-1. SUMMARY OF POTENTIAL IMPACTS AND MITIGATION MEASURES

Impact Number	Impact Name	Significance Before Mitigation	Mitigation Number	Mitigation Name	Significance After Mitigation
Bio-14	Disturbance to Harbor Seals Due to Increased NMSB Presence Near Haul-Out Sites	PS	Bio-M14A	Review Improvements at Certain Sites and Implement Education and Outreach--Educate NMSB Users in Vicinity of Pupping Sites	LTS
			Bio-M14B	Review Improvements at Certain Sites and Implement Education and Outreach--Buffer Zone Signage and Other Markers	
Bio-15	Avoidance or Abandonment of Traditional Harbor Seal Haul-out Sites Due to Increased NMSB Use	PS	Bio-M15	Seasonal Closures, Monitoring and Adaptive Management	LTS
Bio-16	Construction and Trailhead Impacts on Special-Status Animals of Bayland Marshes	PS	Bio-M15, Bio-M2 and Bio-M3	Undertake Waste Management, Predator Control, and Basking Impact Minimization (see above for Bio-M2 and Bio-M3)	LTS
Bio-17	Disturbance to Harbor Seals Due to Construction	PS	Bio-M17	Provide Mitigation for Disturbance to Harbor Seals Due to Construction/Improvements at WT Sites	LTS
Cult-1	Disturbance to Prehistoric Archaeological Deposits During Use of the Water Trail	PS	Cult-M1	Include Protection of Cultural Resources in Education and Outreach Efforts	LTS

TABLE ES-1. SUMMARY OF POTENTIAL IMPACTS AND MITIGATION MEASURES

Impact Number	Impact Name	Significance Before Mitigation	Mitigation Number	Mitigation Name	Significance After Mitigation
Cult-2	Disturbance to Prehistoric Archaeological Deposits During Facility Improvements and/or Use of the Water Trail	PS	Cult-M2A	Undertake Expanded Archival Research and Field Investigations to Provide Information About Potential Prehistoric Archaeological Deposits	
			Cult-M2B	Protect Prehistoric Archaeological Remains in Adjacent Areas	LTS
Haz-1	Exposure of Workers, the Public, or Wildlife to Contaminated Soil or Groundwater from Soil Excavation	LTS	N/A	N/A	N/A
Hyd-1	Local Degradation of Water Quality Due to Construction Activities	PS	Hyd-M1	Employ Construction Best Management Practices	LTS
Hyd-2:	Degradation of Water Quality due to Runoff from Trailheads	PS	Hyd-M2	Implement Stormwater Best Management Practices	LTS
Hyd-3	Degradation of Water Quality due to Improper Sanitation	LTS	N/A	N/A	N/A
Hyd-4	Increased Littering in the Bay	LTS	N/A	N/A	N/A
Hyd-5	Placement of Structures Within 100-Year Flood Zones that Could Impede or Redirect Flows	PS	Hyd-M5	Design All New Permanent Structures to Address Potential Flood Hazards	LTS
LUP-1	Conflict with Federal, State, or Local Land Use Plans and Policies	LTS	N/A	N/A	N/A
LUP-2	Incompatibility with Adjacent or Nearby Land Uses	LTS	N/A	N/A	N/A

TABLE ES-1. SUMMARY OF POTENTIAL IMPACTS AND MITIGATION MEASURES

Impact Number	Impact Name	Significance Before Mitigation	Mitigation Number	Mitigation Name	Significance After Mitigation
TPC-1	Degradation in Levels of Service on Access Roadways	PS	TPC-M1	Undertake Traffic Assessment Prior to Designation of New or Enhanced WT Sites	
TPC-2	Inadequate Parking at New or Improved WT Trailheads	PS	TPC-M2	Undertake Parking Study Prior to Development of New or Enhanced WT Sites	LTS
TPC-3	Inadequate Emergency Vehicle Access	PS	TPC-M3	Evaluate Emergency Vehicle Access at New WT Sites and Sites with Substantial Improvements	LTS
TPC-4	Hazards Due to Unsafe Access Roadways	PS	TPC-M4	Evaluate Plans for New WT Sites to Determine Safety for Vehicle Access	LTS
GHG-1	Increase in Greenhouse Gas Emissions Attributable to the Implementation of the Water Trail	LTS	N/A	N/A	N/A
Notes: LTS Less than significant N/A Not applicable PS Potentially Significant					

1 INTRODUCTION

1.0 INTRODUCTION

The San Francisco Bay Area Water Trail (Water Trail or WT) Draft Environmental Impact Report (Draft EIR or DEIR) is a Program EIR that addresses the potential environmental effects of implementing the San Francisco Bay Area Water Trail Plan (Water Trail Plan, WT Plan, or Plan). This chapter of the Draft EIR provides a brief overview of the WT Plan (BCDC 2007b), the purpose and need for the Plan, the environmental review and compliance process, public involvement and outreach, and the organization of the Draft EIR.

1.1 OVERVIEW OF THE PROJECT

The San Francisco Bay Area Water Trail strives to identify and designate a network of access sites, or “trailheads,” that would allow people in non-motorized small boats (such as kayaks, sailboards, and dragon boats) to safely enjoy the historic, scenic, and environmental richness of San Francisco Bay (SF Bay or Bay) through single and multiple-day trips. The trail network would be designated through the process described in the Water Trail Plan. The Water Trail would bring education about personal boating, navigational safety, and appropriate boating behavior near sensitive wildlife species and shoreline habitat to the boating public through a variety of means. The majority of the 112 trailhead sites proposed for designation as part of the network already exist and are used by the public. The proposed sites are located along the shoreline of the nine San Francisco Bay Area counties.

The WT Plan primary project area is within the San Francisco Bay Conservation and Development Commission’s (BCDC’s) jurisdiction, within the nine-county San Francisco Bay Area. The enabling legislation, the Water Trail Act (Appendix A), and the development of the WT Plan (BCDC 2007b) are summarized in Chapter 2, Project Description. The WT Act does not create any new or additional regulatory or enforcement authority for the agencies implementing the WT Plan.

The WT Plan, currently in final draft form, is a guide to trail implementation for the agencies and organizations that would develop and manage WT access sites and programs, as well as trail proponents and other stakeholders involved in implementation. Recommended policies and procedures in the Plan define how the WT would take shape over time on organizational, program, and project-specific levels. The Plan identifies the 112 potential “Backbone” access sites, including a subset of 57 High Opportunity Sites (HOSs). HOSs are sites that require only minimal improvements (i.e., signage) to qualify for designation as part of the WT. The full text of the WT Plan is available for review on the State Coastal Conservancy’s website (www.scc.ca.gov) and BCDC’s website (www.bcdc.ca.gov).

1.2 WATER TRAIL PLAN PURPOSE AND NEED

The WT has the potential to enhance Bay Area communities’ connections to the Bay and create new linkages to existing shoreline open space and other regional trails. The WT program, as defined in the WT Plan, is needed to:

- Create a coordinated, linked set of non-motorized small boat (NMSB) access locations allowing single point, multiple point, and multi-day itineraries
- Plan for increased NMSB use associated with regional population growth and changes in population demographics
- Promote safe non-motorized small boating practices
- Increase environmental awareness and sensitivity of NMSB users to minimize potential impacts of NMSB use on sensitive wildlife and habitat
- Promote placement of enhanced facilities and any new access locations in areas where they would provide the greatest recreational benefit and avoid or minimize significant adverse impacts to wildlife and habitat
- Optimize the use of available funding for trailhead improvements and other WT activities
- Ensure protection of private property, and
- Minimize impacts on agricultural operations

The benefits potentially associated with the implementation of the WT Plan are extensive and would include:

- Improved NMSB access to San Francisco Bay
- Reduced impacts to sensitive wildlife and habitat, and other resources through appropriately directing the location and types of development associated with access sites and through education of boaters
- Increased high quality information regarding NMSB access facilities through the development of educational and outreach materials
- Increased stewardship of the environment and of trailhead facilities
- Increased opportunities to recreate close to home and use public transportation rather than private vehicles (through the addition of boat storage facilities)
- Increased awareness and provision of facilities that comply with pending Americans with Disabilities Act-Architectural Barriers Act (ADA-ABA) Accessibility Guidelines, and information regarding ADA/ABA design requirements for NMSB facilities
- Improved planning and more effective use of public funding for high priority improvements
- Localized economic benefits to waterfront and water-oriented businesses, and
- Expansion of the other regional trail systems (Bay Trail, Ridge Trail) to include the waters of the Bay

The need for the WT and the potential benefits associated with implementation of the WT Plan are described further in Chapter 2.

1.3 CEQA COMPLIANCE

The California Environmental Quality Act (CEQA) is regarded as the foundation of environmental law and policy in California. Its primary objectives are to:

- Disclose to decision makers and the public the significant environmental effects of proposed activities
- Identify ways to avoid or reduce adverse environmental effects

- Prevent or reduce adverse environmental effects by requiring implementation of feasible alternatives or mitigation measures
- Disclose to the public reasons for agency approval of projects with significant environmental effects
- Foster interagency coordination in the review of projects, and
- Enhance public participation in the planning process

CEQA applies to all discretionary activities proposed to be carried out or approved by California public agencies, including state, regional, county, and local agencies, unless an exemption applies.

The State Coastal Conservancy (Conservancy), as the WT Plan lead agency under CEQA, has prepared this Draft Program EIR to address the potential environmental impacts of implementation of the Water Trail Plan and to satisfy the procedural, analytical, and public disclosure requirements of CEQA.¹ As a Program EIR (CEQA Guidelines Section 15168), it analyzes the potential effects of implementing a regional plan, rather than the impacts of an individual project, and identifies mitigation measures that would be applied, as appropriate, to reduce or eliminate impacts at various Bay access locations. The key issues it focuses on are recreation, navigational safety, and biological resources (vegetation, wildlife, and aquatic resources). It also addresses hazardous materials; land use; aesthetics; cultural resources; public services; hydrology and water quality; transportation, circulation, and parking; and greenhouse gas emissions. The Conservancy will use this document to evaluate the WT Plan for approval.

A Draft EIR for the WT Plan was previously released to the public in June 2008 and extensive comments were received. The Conservancy, in coordination with the other Project Management Team (PMT) member agencies (staff from BCDC, the Association of Bay Area Governments (ABAG), and the California Department of Boating and Waterways (Cal Boating)), is recirculating the Draft EIR after making revisions to most effectively and comprehensively address those comments, clarify potential impacts, and refine mitigation measures. General comments were addressed through overall revisions to this DEIR. Site-specific comments were retained for use during the trailhead designation process (see Chapter 2). An analysis of greenhouse gas emissions associated with implementation of the Water Trail Plan has been added in response to the Conservancy's policy of evaluating the effects of proposed projects on climate change, and because amendments to the CEQA guidelines requiring evaluation of greenhouse gas emissions were enacted in 2009 and took effect on March 18, 2010.

CEQA review for specific sites may tier off of this Program EIR after it is certified. The PMT, with assistance from an Advisory Committee to be formed, will reference the Final EIR in their site-specific review of trailheads as they are considered for inclusion into the WT and work with the site owners/managers to help them comply with CEQA, as appropriate to the circumstances of the individual site. The site owner/manager of each site, if a public agency, will serve as the CEQA lead agency for trailhead designation and implementation of any WT-related site enhancements, possibly tiering their site-specific CEQA reviews off of this document. Where

¹ Pursuant to the California Environmental Quality Act Statutes (Public Resources Code Sections 21000, *et seq.*) and implementing Guidelines (14 California Code of Regulations Sections 15000 *et seq.*).

potential WT access sites are privately-owned, cities, counties, or other public agencies with discretionary authority over activities at that site would serve as lead agencies for CEQA. BCDC and other regulatory agencies may also use this document when issuing any permits required for trailhead improvement projects.

This document is intended to address the regional impacts of implementing the WT Plan on Bay-wide resources. It addresses general impacts that could occur with increased use and/or development of proposed WT sites. It does not include site-specific environmental analyses, but does consider proposed WT sites in the context of local and regional sensitive environmental resources. As such, it may be used to guide subsequent environmental review of designation/improvements at those sites. This Program EIR also addresses potential cumulative impacts of implementing the WT Plan in combination with other shoreline recreational projects, projected growth in NMSB use absent the Water Trail, and other projects with potentially overlapping impacts.

Provided the environmental impacts of future activities are adequately addressed in this document, additional CEQA documentation may not be required for individual (site-specific) projects. If additional environmental analysis is required for future activities and newly identified impacts, or to introduce new mitigation measures, subsequent environmental documents may be tiered from the analyses contained herein (CEQA Guidelines Section 15168 [c] and Section 15177).

1.4 PUBLIC INVOLVEMENT AND SCOPING

The CEQA process includes opportunities for the public to review and comment on projects that may affect the environment. CEQA provides for public participation through:

- Project scoping
- Publication of the Notice of Preparation (NOP) and Notice of Availability (NOA)
- Public review of environmental documents, and
- Public hearings

The Conservancy formally initiated the scoping process for this EIR by submitting the NOP to the California State Clearinghouse on November 15, 2007 and posting the NOP on the Conservancy website. In addition, a notification letter was issued to interested agencies, organizations, and members of the public. It included an attached Initial Study (see Appendix B) that summarized the proposed scope of environmental analyses to be included in the EIR. The public scoping meeting on the proposed EIR was held in San Francisco on November 28, 2007. Scoping comments were accepted through December 23, 2007. A wide range of comments were received during the scoping process. These comments are summarized in Appendix C, Summary of Scoping Comments. Other scoping activities for this Program EIR included early consultation with stakeholders and interagency consultation.

Distribution of the NOA for the June 2008 Draft EIR began on June 9, 2008 for the review period that commenced June 12, 2008. A public hearing for the 2008 DEIR was held on July 9, 2008. Written comments were accepted through July 28, 2008 from a total of 24 agencies, organizations and individuals. Those comments were considered in the development of this

recirculated DEIR. The public will have the opportunity to comment on this recirculated DEIR during a new public review period of 45 days or more that will be announced when this draft is released. The announcement of the new public review period will include the date, time, and location for a new public hearing. Any substantive written comments received at the public hearing or during the new review period will be responded to in writing in the Final EIR.

1.5 DOCUMENT ORGANIZATION

This EIR is organized into the following chapters:

- **Chapter 1: Introduction.** Provides an overview of the project, purpose and use of the EIR, public involvement process, and document organization.
- **Chapter 2: Project Description.** Describes the purpose, objectives and implementation of the WT; project location; and existing conditions and projected growth.
- **Chapter 3: Environmental Setting, Impacts, and Mitigation Measures.** Includes descriptions of the regulatory and environmental setting, and the impacts to each resource that may occur as a result of implementation of the WT Plan. Mitigation measures for potentially significant impacts are identified, and residual impacts (following application of mitigation measures) are assessed.
- **Chapter 4: Cumulative Impacts and other CEQA Sections.** Summarizes the project's growth inducement, unavoidable significant adverse impacts, cumulative impacts/mitigation, and irreversible/irretrievable impacts.
- **Chapter 5: Alternatives to the Project.** Describes the alternatives considered, and provides a summary of the potential impacts of two feasible alternatives compared to the potential impacts of the project. It also describes the No Project alternative and identifies the CEQA "environmentally superior" alternative.
- **Chapter 6: Report Preparers and References.** Identifies the preparers of this document and lists the references cited in the document.
- **Appendices.** The appendices provide additional information regarding the environmental review process and technical information that was used in the EIR analyses. Pursuant to CEQA requirements, materials and literature referenced in the EIR, but not included in Appendices, are maintained at the Conservancy offices in Oakland, California.
 - **Appendix A** – Water Trail Act
 - **Appendix B** – Initial Study
 - **Appendix C** – Summary of Scoping Comments
 - **Appendix D** – List of Strategies
 - **Appendix E** – Preliminary Environmental Effects Checklist for Trailhead Designation Process
 - **Appendix F** – Local Climate Action Plans (CAPs)
 - **Appendix G** - Methodology for Estimating Greenhouse Gas (GHG) Emissions from the San Francisco Bay Area Water Trail
 - **Appendix H** – Supplemental Strategies for the Enhanced Water Trail Plan Alternative

2 PROJECT DESCRIPTION

2 PROJECT DESCRIPTION

The “project” being evaluated under this programmatic Environmental Impact Report (EIR) is implementation of the draft Water Trail Plan (WT Plan or Plan). This chapter describes the project background, presents information on existing non-motorized small boat (NMSB) use in and NMSB access to San Francisco Bay (SF Bay or Bay), describes the anticipated growth in NMSB use, and describes the WT Plan itself, including locations, potential site enhancements, and how the Water Trail (WT) would be implemented and operated.

2.1 Water Trail Overview

The goal of the San Francisco Bay Area Water Trail is to preserve, promote, and plan for safe and environmentally sound NMSB access to the waters of San Francisco Bay, both for recreational enjoyment and increased stewardship of the Bay’s unique resources.

2.1.1 THE WATER TRAIL ACT

The California legislature established the WT by enacting the Water Trail Act (AB 1296, Appendix A) in September 2005. The WT is intended to improve access to, within, and around the Bay, coast, ridgetops and urban open spaces; and to advance the San Francisco Bay Conservation and Development Commission’s (BCDC’s) mandate to foster public access and recreational use of the Bay. Improved access, as described in the WT Act, includes linking existing and future NMSB access locations around the Bay and providing diverse water-accessible overnight accommodations, including camping, to the extent feasible. The legislation also states that the WT shall be developed in a manner that will:

- Respect the rights of private property owners
- Consider navigational safety and homeland security concerns in siting access locations and overnight accommodations
- Minimize adverse effects on agricultural operations, and
- Protect endangered and threatened species, and species of special concern

The goals and priorities listed in the WT Act create a multi-faceted mission for the WT. While the WT Act is intended to enhance the non-motorized small boating experience in San Francisco Bay, it is not specifically designed to increase NMSB use as a goal in and of itself. Nonetheless, some growth in NMSB use may result from some of the actions taken to achieve the goals of the WT Act. More central to the intent of the WT Act is the goal of preserving and increasing opportunities for and education about safe and responsible, including environmentally-responsible, water-oriented recreation. Recreation benefits the public welfare, and education leads to more responsible boating practices, ultimately benefitting Bay resources. Furthermore, implementation of the WT may provide localized economic benefits.

The WT Act directs BCDC, in coordination with other agencies and organizations, to conduct a public process to develop the WT Plan. The WT Act directs the Conservancy to lead the funding and development of projects implementing the Plan, but does not provide any guaranteed sources of funding.

The WT Act does not provide any regulatory powers to the Conservancy or any new regulatory powers to any other agency potentially involved with the WT. Nonetheless, it directs the Conservancy to evaluate the suitability of various areas for NMSB access: “In developing the plan and undertaking projects to implement the plan, areas for which access is to be managed or prohibited shall be determined in consultation with resource protection agencies, the United States Coast Guard, the Water Transit Authority [later renamed the Water Emergency Transportation Authority], the State Lands Commission, local law enforcement agencies, and through the environmental review process required by the California Environmental Quality Act (Division 13 (commencing with Section 21000)).” This evaluation process is integrated into the WT Plan implementation process described in Section 2.4, and into the WT Plan strategies described in Section 2.3.3.

2.1.2 WATER TRAIL PURPOSE AND NEED

San Francisco Bay and its tidally-influenced tributaries comprise the largest open space in the nine-county Bay Area. As growth in the region creates additional pressures on existing open spaces, recreational opportunities within the Bay and its tributaries become increasingly important. NMSB use in SF Bay is a popular form of recreation. An extensive survey of NMSB use in California, entitled *Non-Motorized Boating in California*, was performed by the California Department of Boating and Waterways (Cal Boating) in 2006 – 2007 (Cal Boating 2009). The survey indicates that in 2006, there were an estimated 372,233 individuals in the Bay Area participating in NMSB use of all kinds, and that statewide NMSB use is expected to increase at a rate greater than population growth.¹

The survey provides information regarding the specific needs of NMSB users, and supports the priorities identified in the WT Act. For example, of the 15 facility needs assessed in the Cal Boating survey, improved access was rated as the highest need for NMSB users in San Francisco Bay, followed by parking. Improved parking security and overnight parking to allow for multi-day trips were key points of concern. Lack of access was the main reason that users avoided areas throughout San Francisco Bay (Cal Boating 2009).

Other considerations that support the need for the WT include the following:

- Natural deterioration and a lack of funding to pay for repairs may lead to the loss of existing NMSB access locations over time. This is exemplified by the recent loss, possibly only temporary, of several access sites in Marin County, such as Higgins Dock in the Town of Corte Madera. Without an overarching program, such as the WT, to help find funding to replace or improve deteriorating sites, additional access sites may be lost.
- NMSB access to the Bay is currently provided on a site-by-site basis by a variety of site owners and operators. The competing pressures of increased NMSB use and increased development in the Bay Area require a planned and coordinated approach to NMSB access and use in the Bay. For example, there is no overall effort to ensure that access sites are provided at optimal locations in terms of boater safety, environmental protection, or distance between sites.

¹ The statewide growth numbers are not broken down by region.

- Although there are some NMSB safety programs provided by Cal Boating, the US Coast Guard Auxiliary, vendors, and various boating clubs and organizations, there is a lack of safety training for novice and non-local boaters (BCDC 2006b).
- Potential environmental effects of non-motorized boating activities are addressed through education and outreach efforts by some of the boating clubs and organizations around the Bay (CCP 2008). Additionally, permit requirements imposed during construction of access facilities and implementation of state and federal environmental regulations address potential environmental effects. However, these regulations and requirements are implemented on a project basis and are thus limited in their overall scope and ability to address Bay-wide concerns.
- There are currently no universally accepted design guidelines for non-motorized small boating facilities that address the shoreline topography of San Francisco Bay.² Instead, development of facilities is completed on an *ad hoc* basis by individual site owners and managers.
- Centralized information regarding the locations of existing sites, their facilities, and any safety and environmental considerations associated with them is lacking. The cumulative environmental and safety impacts of the many existing and planned sites have not been evaluated on a regional basis.

In response to these needs, the WT would:

- Help preserve existing access locations and work with local jurisdictions to advocate for inclusion of NMSB access in waterfront planning.
- Work directly with site owners to keep as many of the existing sites as possible available in the future.
- Provide outreach, and funding as available, to support the preservation of existing sites.
- Encourage site owners to make their sites accessible, and serve as a resource for compliance with the pending Americans with Disabilities Act-Architectural Barriers Act (ADA-ABA) Accessibility Guidelines.
- Perform outreach to actively inform the residents of the Bay Area and interested visitors about the many opportunities for non-motorized small boating in the Bay. This outreach would include information about concessionaires that provide boating instruction, places to stay and eat/drink, the environmental sensitivity of various sites, safety considerations, and opportunities for adding new sites.
- Help coordinate, expand, and enhance existing educational efforts on boating safety, navigational safety, and avoiding impacts to wildlife and sensitive habitat to provide more comprehensive education to all NMSB users. An additional goal of the education program would be to foster stewardship of the Bay's resources through an increased appreciation of these resources.
- Strive to help minimize conflicts between different user groups at the same waterfront location.

² While the National Park Service has an excellent set of design guidelines for NMSB launches, more specific guidelines are needed to address the challenges of the Bay shoreline.

The improved planning and coordination, and more extensive education and outreach provided by the WT may also offset some of the effects of increased NMSB use expected to occur due to population growth (i.e., non-WT-induced growth). Increased publicity and specific site enhancements may lead to localized economic benefits for waterfront or water-oriented businesses.

2.1.3 WATER TRAIL PLAN DEVELOPMENT

Consistent with the WT Act, BCDC convened a 13-member WT Steering Committee to develop the Water Trail Plan (BCDC 2007b). The Committee was drawn from five primary interest categories: NMSB groups in the Bay Area; shoreline resource planners, managers, and owners; Bay Area navigational safety and security groups; wildlife and environmental protection interests; and, environmental education and stewardship interests.

The core of the Steering Committee's work occurred in seven public planning meetings that were held from February 2006 through March 2007. In these meetings, the Steering Committee and members of the public discussed and provided recommendations on NMSB access, trail-related wildlife and habitat issues, safety and education, the organizational structure for the WT, and trailhead designation. All background reports, meeting notes, and the final draft Plan itself are posted on BCDC's website at www.bcdc.ca.gov. The WT Plan may also be reviewed in its entirety on the Conservancy's website at www.scc.ca.gov.

The extensive stakeholder involvement in the development of the WT Plan is complemented by the public outreach being implemented as part of the environmental review process (described in Section 1.4).

2.1.4 WATER TRAIL LOCATION

The primary project area for the WT is defined in the WT Act authorizing legislation as the area within BCDC's jurisdiction defined in Section 66610 of the Public Resources Code, and the area described in Section 29101 of the Public Resources Code (i.e., primary and secondary management areas of Suisun Marsh as shown on the Suisun Marsh Protection Plan Map). The primary project area can be summarized as follows (BCDC 2007a):

- The open water, marshes and mudflats of greater San Francisco Bay, including Suisun, San Pablo, Honker, Richardson, San Rafael, San Leandro and Grizzly Bays and the Carquinez Strait
- The first 100 feet inland from the shoreline³ around San Francisco Bay
- The portion of the Suisun Marsh-including levees, waterways, marshes and grasslands-below the ten-foot contour line
- Portions of most creeks, rivers, sloughs and other tributaries that flow into San Francisco Bay, and
- Salt ponds, duck hunting preserves, game refuges and other managed wetlands that have been diked off from San Francisco Bay

³ The shoreline is defined as being located at 5 feet above mean sea level.

Nine counties have shoreline along San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma.

Within the primary project area, the WT Plan identifies 112 potential trailhead locations, as shown on Figures 2.1.4-1A and 2.1.4-1B and discussed in more detail in Section 2.3.2, below. Potential WT sites are located in all nine Bay Area counties. Additional trailheads in the primary project area may be identified in the future.

2.1.5 SURROUNDING LAND USE

Potential WT trailheads are located in a variety of settings, ranging from highly developed, to less developed, to natural areas. These sites are a subset of the launch and destination sites that currently exist around the Bay.

Highly developed areas include commercial, industrial, or residential complexes. There are three major airports (San Francisco, Oakland, and San Jose International) and several smaller ones along the shore of the Bay (including those in Hayward, San Carlos, Novato, Napa, and Palo Alto). Major ports include Oakland, San Francisco, Richmond, Petaluma, Benicia, and Redwood City. Major refineries and heavy industrial complexes include those on the shorelines of the Carquinez Strait, southeastern portions of San Pablo Bay, and South San Francisco Bay. There are also multiple wastewater treatment plants that discharge treated effluent to the Bay. Development near the Bay's edge also includes clusters of commercial buildings and urban, suburban, and semi-rural residences in many locations.

Less developed and relatively more natural areas around the Bay include federal wildlife refuges; local, regional, state, and federal parks, reserves, wildlife areas, and recreation areas; former landfill sites; portions of former military bases undergoing conversion to non-military uses; private undeveloped lands; and agricultural lands (primarily in the North Bay). In addition, salt pond complexes around the perimeter of South San Francisco Bay and Redwood City and along the Napa River are mostly undeveloped and provide important habitat for birds.

2.2 Non-Motorized Small Boating in the Bay Area

Non-motorized small boat use in the Bay Area occurs against a backdrop of other extensive and varied boating activity, as well as regulatory and environmental factors. Non-motorized boating participants use a wide variety of watercraft in a wide range of settings.

2.2.1 BOATING IN THE SAN FRANCISCO ESTUARY

The San Francisco Estuary is a complex boating environment. Extensive recreational boating and commercial shipping activities occur in the Bay. These activities are regulated and managed by a wide range of organizations, including federal, state and local governments; parks and recreation districts; regulatory agencies; ports; and public and private marinas, among others. Commercial ships using the Bay include container vessels, tankers, oil barges, cruise ships, ferries, fishing vessels, and service vessels, including tugboats and barges. Large shipping vessels have deep drafts, and are restricted to specified shipping lanes that can provide sufficient deep water and provide an adequate margin of separation between the large vessels. Commercial ship traffic is managed by the Vessel Traffic Service (VTS) operated by the U.S. Coast Guard (USCG).



Figure 2.1.4-1A
Proposed Water Trail
Backbone Access Sites
San Pablo Bay and Suisun Bay

Water Trail GIS data provided by BCDC



WETLANDS AND
 WATER RESOURCES, INC.

GEC Co Environmental Consulting



Figure 2.1.4-1B
Proposed Water Trail
Backbone Access Sites
San Francisco Bay

Bay Water Trail GIS data provided by BCDC



GEC Environmental Consulting

Recreational boating includes motorized and non-motorized boats. Motorized boats used for recreational purposes range in size from large boats providing Bay cruises and organized fishing to small sail or rowboats with outboard motors. The WT is designed to facilitate non-motorized small boat use. Non-motorized small boats described in the WT Plan include kayaks, canoes, various types of rowboats and paddleboats (including whale boats, dragon boats, and sculls), windsurfers, and kitesurfers. Recreational boating may be done on an individual basis, as part of an organized tour, or as part of a race or other organized event.

MOTORIZED AND NON-MOTORIZED BOAT OWNERSHIP IN CALIFORNIA AND THE SAN FRANCISCO BAY AREA

There is no single ownership or use survey that provides consistent comparisons of the number of motorized boats versus NMSBs statewide or in San Francisco Bay. Approximately every five years, Cal Boating conducts an assessment of all recreational boating facilities in the State to assist in the allocation of boating facilities and resources, but given the state's funding crisis, the most recent study of this type was published in 2002, based on data from 2000 (Cal Boating 2002). The number of NMSBs in the state at that time was estimated, as presented in the text below, but NMSBs were not the focus of that study. The estimated number of NMSBs in that study was based on a nationwide estimate from the National Marine Manufacturer's Association factored to the number of boats registered in California (Cal Boating 2002). Cal Boating published a study specifically of NMSB ownership and use in the state in 2009, but that study did not survey motorized boat ownership (Cal Boating 2009). The 2009 study provides statistically valid data regarding NMSB ownership and use in the state and in the San Francisco Bay Area.

While the differences in the time periods, methodology, and focus of the two studies make it impossible to directly compare the number of motorized boats vs. NMSBs currently owned and used in the state and in the San Francisco Bay Area, it is possible to compare the general magnitude of boat ownership and use for these two types of recreational boats. The counties included in the data for the "San Francisco Bay Region" of both studies were Alameda, Santa Clara, San Mateo, San Francisco, Marin, Napa, Solano, and Contra Costa. Sonoma County was not included; it was included in the North Coast Region.

The emphasis of the 2002 study is on recreational boating. While it did not exclude commercial boating activities, it did not specifically research commercial boating. The study indicated the following ownership patterns:

- As of December 31, 2000, there were 925,533 registered or otherwise documented boats in California (most registered boats are motorized boats). According to an estimate provided in the report, there were also 113,238 non-motorized boats (97,000 of which were non-registered) in California at that time, or about 12% of the boat total.
- There were an estimated 158,223 recreational (presumably motorized) boats in the Bay Area in 2000.

The more recent Cal Boating study (Cal Boating 2009), which collected data in 2006 and 2007 and focused specifically on non-motorized boating in California, provides a substantially higher estimate of total NMSBs owned in the State and Bay Area: 1.7 million and 297,465, respectively. These data are considered more reliable than the estimate provided by the 2002 Cal

Boating Report, which simply applied a percentage factor to the total number of registered boats to estimate the number of non-motorized boats.⁴

Table 2.2.1-1 illustrates the estimated number of NMSBs owned by Californians by boat type and the percent of total statewide NMSBs for each type (adapted from Table 2.2 in Cal Boating 2009). Note that 41.5% of these NMSBs are “inflatable,” which means “inflatable boats and rafts.” Inflatable kayaks would be included with “kayaks.” (Inflatable boats and rafts are not included in the Water Trail Plan because they are rarely used on San Francisco Bay.)

TABLE 2.2.1-1: ESTIMATED NUMBER OF NMSBs BY BOAT TYPE IN CALIFORNIA IN 2006

Boat Type	Statewide⁽¹⁾	Percent of Total
Inflatable	711,509	41.5%
Kayak	543,251	31.7%
Canoe	191,505	11.2%
Rowing Boat	160,735	9.4%
Sailboard/Kiteboard	55,969	3.2%
Small Sailboat ⁽²⁾	42,770	2.5%
Other	9,010	0.5%
TOTAL	1,714,749	100.0%

Notes:

- (1) Source: California Department of Boating and Waterways, *Non-Motorized Boating in California*, Table 2.2. March 2009.
- (2) Many boaters consider any sailboat that they store at home, and load on their car, as a "small sailboat" even if the sailboat is longer than 8 feet in length. The estimate of small sailboats includes a significant number of these larger small sailboats.

Excluding the inflatables that are owned by Bay Area residents but not used on San Francisco Bay results in an estimated 174,017 NMSBs that may be used on San Francisco Bay, based on 2006 data. Thus, based on 2000 and 2006 data, respectively, the estimated numbers of motorized and non-motorized boats that would be likely to be used on San Francisco Bay appear to be generally similar.⁵

The mix of power boats, ships, large commercial vessels, and NMSBs on the Bay poses potential navigational risks to NMSBs. Most larger vessels lack maneuverability and operate at speeds that far exceed the speed achievable by most human-powered craft. Navigational safety concerns may be exacerbated by recreational boaters’ lack of awareness regarding navigation rules and requirements on the Bay, or lack of boating experience. Although actual collisions are rare, avoidance measures required when there are “near misses” can also lead to dangerous situations;

⁴ The Cal Boating 2002 estimate was based on the estimated percentage of non-motorized small boats as identified in the National Marine Manufacturer’s Association Year 2000 Boating Abstract. It is not specific to California.

⁵Based on the 2002 Cal Boating study, the projected growth rate for motorized boats statewide would increase the motorized boat number of 158,223 to between 170,223 and 173,823 in 2006. See Chapter 4 for further discussion of predicted growth rates.

for example, several years ago a container vessel ran into a Bay Bridge support while avoiding a sailboat (BCDC 2006b).

The Bay also poses potentially challenging physical conditions that could lead to dangerous situations, especially for NMSBs. Cold waters, rapidly changing weather conditions and strong tidal currents occur in the Bay and can create safety hazards. NMSB users may be faced with strong afternoon wind, thick fog, currents up to six knots, water temperatures between 45° and 60°F, and seasonal weather variations. Paddleboat and boardsailing activities also involve extensive contact with the water, which can expose the boater to poor water quality at certain locations and/or in certain weather.

Finally, national security is another factor affecting NMSB use in the Bay. If NMSB users stray into a safety exclusion zone,⁶ the consequences can be severe (e.g., arrest and, in the extreme, being shot at).

2.2.2 PROJECTED GROWTH IN NON-MOTORIZED SMALL BOAT USE

Non-motorized small boat use in the Bay Area is projected to increase over time, with or without the WT Plan (Cal Boating 2009). Growth in NMSB use may include new NMSB users, as well as increased participation in NMSB activities by existing users. The purpose of this EIR is to analyze the potential environmental impacts of NMSB use with implementation of the WT Plan over existing and future NMSB use without implementation of the WT Plan. Both types of growth could affect environmental resources.

The total number of days that people participate in NMSB activities (“participant-days”) is the most appropriate measure of growth because it reflects time spent on the water. As an example, if a user gets out on the Bay only twice in a given time period, the activity for that one individual would be two participant-days; the activity for an individual who goes boating ten times in the same period would be ten participant-days. According to the 2009 Cal Boating report, there were an estimated 7,390,324 participant days by San Francisco Bay Region NMSB users in 2006 (including the use of inflatables). The specific number of participant days for NMSB use on San Francisco Bay is difficult to characterize because the 2009 Cal Boating report focused on use by owners from specific regions, but did not quantify specifically where this use occurred. Telephone surveys of San Francisco Bay NMSB users indicated that they also used inland lakes, reservoirs, North Coast rivers, and the Sacramento-San Joaquin Delta in addition to various areas in San Francisco Bay. Less than half the survey respondents from the San Francisco Bay Region described waterways in the SF Bay Region as their most-used waterways (Cal Boating 2009).

The anticipated growth in NMSB use in the Bay Area (with or without the WT) cannot be predicted with any certainty. The Cal Boating survey (2009) provides perhaps the best dataset available for use in this EIR. In addition, some numerical information regarding national historical and projected future trends in NMSB use is available. Much of the national information is based on sales or total participants. However, the data available for analysis of

⁶ Safety Exclusion Zones are areas where navigation is prohibited to protect land-side facilities and/or protect boaters from hazards.

past practices and trends is limited and is based on a mix of metrics. Available data and observations regarding non-motorized boating trends are further discussed in Section 3.3.

FACTORS POTENTIALLY AFFECTING GROWTH IN NMSB USE

There are multiple factors that may affect the growth of NMSB use, and these factors may lead to substantial variations in growth rates at different access locations. The primary factors potentially affecting growth in NMSB use are the following:

- Regional population growth
- Growth (or decline) in specific NMSB sports
- The age profile of the population
- Publicity regarding available opportunities for participating in NMSB sports, and
- Types of launch, supporting, and ancillary facilities available at access sites

These points are discussed further in Section 3.3.

BASELINE NMSB GROWTH PROJECTIONS

The Cal Boating (2009) study estimates that between 2002 and 2006, 135,759 California households began to participate in non-motorized boating activities, most commonly using inflatable boats or rafts, or plastic recreational kayaks. This estimate is based on the reported increase in boat ownership by household during this period and represents a 3.84% compound annual growth rate for non-motorized boat ownership. The annual increase in boat ownership presumably reflects an increased interest and participation in NMSB use, but based on the available information, it is not possible to isolate the influence of population growth from other factors. Population growth data for California are, however, available, and show 1.34% annual compound growth in the number of households for the same period (Cal Boating 2009). This suggests that more than half of the increase in the number of households owning NMSBs is due to increasing interest in non-motorized boating.

The Cal Boating survey (2009) also presents low, medium, and high growth rate projections for NMSB users (based on the number of boat-owning households) in 2010. The low rate is based on the same percentage of total households owning NMSBs in 2010 as in 2006. Because there will be more households in 2010, the absolute number of boat-owning households is greater than in 2006. The medium growth rate uses the 3.84% compound annual growth rate described above (i.e., 3.84% growth in the number of NMSB-owning households and a constant number of NMSB participants in all households as compared to 2006). The high growth rate uses the 3.84% growth rate described for medium growth plus the Department of Finance population growth projection for 2010. The low estimate for 2010 is 2,063,801 participants in California households owning non-motorized boats, the medium estimate is 2,228,077 participants, and the high estimate is 2,274,395, all based on an assumption of 2.41 participants (not boats) per household.

When considering projected growth of NMSB use in the San Francisco Bay Area, this EIR uses the medium growth baseline of 3.84% because it appears to most accurately reflect growth without substantially underestimating or overestimating the likely increase in boat ownership and

use. Although the projected growth estimates provided in the Cal Boating survey are for the State of California as a whole, they are the best data available for the San Francisco Bay region.⁷

Growth in NMSB use is expected to continue in the long-term. While there may be a decline, as baby boomers age, in the *percentage* of households that participate in NMSB sports, due to the projected overall population growth in California (from less than 37 million today to 50 million by 2050), *total* participation is expected to increase over time. Non-motorized small boating is also attracting a more ethnically diverse group of boaters, which could contribute to sustained growth over time (Cal Boating 2009). The population of the San Francisco Bay Area is expected to increase from 7,341,700 in 2010 to 9,073,700 in 2035 (ABAG 2009).

Based on the Cal Boating study estimates from 2006, there were an estimated 5.3 million participant-days associated with NMSBs (other than inflatable rafts) owned by Bay Area residents and potentially used on San Francisco Bay in 2006 (on average NMSB owners statewide boated 24 days per year).⁸ The estimated 3.84% annual growth would translate to a total growth of 16.3% over four years, or an additional 0.9 million Bay Area participant-days by 2010. Thus, by 2010, there would be a total of 6.2 million participant-days for the use of NMSBs associated with participants from the San Francisco Bay Area. While it is impossible to accurately define the number of participant-days associated strictly with San Francisco Bay (i.e., as described above, NMSB users from the San Francisco Bay region also use numerous other water bodies), the number of participant-days in the area provides a general context for the level of NMSB use. Potential WT effects on growth in participant-days are evaluated in comparison to this baseline.

WATER TRAIL EFFECTS ON GROWTH

While inducing growth in NMSB use is not the main purpose of the WT, implementation of the WT could result in a small increase in the number of participant-days in San Francisco Bay, above what might have occurred without the WT. This incremental increase could occur because the WT would provide outreach and information about the WT, help coordinate and promote educational activities for NMSB users, help to fund certain facility improvements, and help advocate for potential new access sites in appropriate locations. WT-related growth in NMSB use could potentially occur regionally (an overall increase in the number of participant-days throughout the nine-county Bay Area), or at the local site level.

⁷ Potential growth in NMSB use due to increased use of rental equipment and increases in Club participation was not specifically examined in the 2009 Cal Boating report, but growth in these categories is also expected to occur (Cal Boating 2009). However, these two types of uses combined comprised only 5.4% of total participation days in 2006 (Cal Boating 2009).

⁸ There were an estimated 7.4 million total participant days for the Bay Area in 2006. Assuming that inflatables, which would not be used on the Bay, account for 28.3% of all NMSB use (as opposed to ownership) (Cal Boating 2009), 71.7% of NMSB use associated with the Bay Area could actually occur on the Bay. The average number of participants per NMSB-owning household statewide was estimated to be 2.41.

Factors that drive *regional* growth include population trends, overall participation trends in the various NMSB sports, and the population age profile. Publicity may also increase overall participation in non-motorized small boating by improving access to information.

This incremental regional effect on growth associated with implementation of the WT is expected to be very minor compared to the anticipated regional growth driven by population growth and population demographics. This conclusion is based on several factors. There are significant barriers to entry for non-motorized small boating, including physical fitness requirements, the challenging conditions of boating on San Francisco Bay, and costs of participating in the sports. Furthermore, the types of activities that would occur with implementation of the WT are the same types of activities that would occur absent the WT, although implementation of the WT would provide additional publicity, some additional funding, and a more coordinated implementation process. Any incremental regional growth above the growth projected in the Cal Boating study would be extremely difficult to discern.

Growth at the *site-specific* (local) level is expected to be most influenced by publicity and improvements to facilities and services (e.g., guided trips) at a site. If facilities deteriorate, or a nearby site adds attractive facilities, use of a specific site may decline. In some cases, the number of users of a particular site may be constrained by multiple factors, and implementation of a single site enhancement would not be sufficient to change use patterns. The likely effect of any specific enhancement at a specific site would have to be assessed in the context of that site. It is anticipated that only a small percentage of WT trailheads would have enough facility improvements to draw additional users.

Site-specific growth in use would be more apparent than regional growth; however, determining whether site-specific growth is attributable to the WT would also be very difficult. For example, while the Trailhead Plan may recommend certain facility improvements that could lead to increased use of a site, it would be impossible to determine whether the site owners/managers would have made most or all of these recommended improvements absent the WT.

In addition, none of the factors that *may* lead to increased use of a site would necessarily result in increased use. For example, outreach about a site would not necessarily attract additional boaters. Boaters may not want to travel far from home, or they may have their boat stored at a certain site. A site that is already being used at capacity, as limited by parking spaces, may not be able to accommodate additional use, even if more boaters would like to use it (unless parking is increased).

2.2.3 BOATING REGULATIONS

The USCG regulates navigation in San Francisco Bay by issuing and enforcing rules that govern navigation practices, marine events, and safety and security zones within the Bay. The Inland Navigation Rules (commonly called the “Rules of the Road”) apply to “every description of watercraft” and address vessel sailing and steering as well as use of lights and sound (“Rule 3,” 33 United States Code [U.S.C]. § 2003(a)). To enforce these rules, the USCG investigates incidents reported by mariners, and imposes fines and license suspensions for violations. Within the context of navigation in the Bay, Rules 5, 8, 9, and 25 (33 U.S.C. § 2007, 2008, 2009, 2025) are especially relevant to non-motorized small boating.

- Rule 5 requires boaters to maintain a “look-out” while operating a vessel
- Rule 8 describes actions that a vessel operator must take to avoid collisions
- Rule 9 requires vessels (including NMSBs) to keep clear of, and not hinder or interfere with, transit of larger vessels that can “safely navigate only within a narrow channel or fairway”
- Rule 25 requires all vessels under oars (this definition includes NMSBs) operating between sunset and sunrise and during periods of restricted visibility to have ready a hand or electric torch or lighted lantern showing white light which must be displayed in time sufficient to avoid a collision

Although the Rules of the Road apply to NMSBs, they are not specific to NMSBs.⁹ The Rules lack codes of conduct for interactions between certain vessel types that are common on the Bay, including sailboats or small motorboats and kayaks. Regardless of the type of interaction, the Rules oblige a boater to try to avoid a collision, even if s/he has the right of way (33 U.S.C. § 2017). In practical application this usually means that a smaller, more maneuverable boat will have to get out of the way of a larger vessel.

To facilitate compliance with the Rules of the Road, the Coast Guard operates the Vessel Traffic Service (VTS) of San Francisco Bay. VTS acts as a clearinghouse of real-time information on commercial vessel movements on the Bay. VTS staff inform “mariners of other vessels and potential hazards,” and provide recommendations and direction to mariners on courses of action to prevent accidents (USCG 2006). Detailed information pertaining to navigation regulations is provided in Section 3.2.

2.2.4 USE OF NON-MOTORIZED SMALL BOATS

Many natural variables affect the levels of use and use patterns of NMSBs. The primary variables are tides, currents, winds, depth of water, time of day, and season of the year. These five factors combine to provide a highly variable mix of recreational boating settings in different locations. Wildlife habitats and the species they support can also affect patterns of NMSB use by serving as attractions and destinations while also being the cause of seasonal closures in some locations, such as in Richardson Bay and Mowry Slough in the South Bay. Other variables that affect NMSB use and use patterns are location of access points, safety exclusion zones, and other boating activities. In addition, there is a wide variation in use patterns among the different types of NMSBs.

Figure 2.2.4-1 shows the different types of NMSBs included in the WT Plan. The popularity of the various types of NMSBs has changed over time, and will likely continue to change in the future. Information on each of these types of boats, and the level of participation is provided below. The information regarding the percentage of participants and participant-days is taken from *Non-Motorized Boating in California* (Cal Boating 2009), unless otherwise indicated. The different types of NMSBs have very different use patterns.

⁹ In one case, the Rules do specifically identify vessels that might use the Water Trail; Rule 25 addresses lighting requirements for sailing vessels less than 7 meters long and vessels under oar (33 U.S.C. §2025).

Figure 2.2.4-1. Water Trail User Groups

<p>Kayak</p> 	<ul style="list-style-type: none"> ▪ Closed-hulled; 12-19' long; use double-bladed paddle ▪ Sea kayaks (with cock-pit style seat) are well-suited to the Bay ▪ Touring kayaks have space for equipment
<p>Canoe</p> 	<ul style="list-style-type: none"> ▪ Open-hulled; single-blade paddle ▪ Well-suited to protected waters of sloughs and creeks ▪ Not well-suited to open Bay
<p>Dragon boat</p> 	<ul style="list-style-type: none"> ▪ Open-hulled; 40' long; 22 people on board (20 paddlers) ▪ Team racing is popular ▪ Some hull designs stable enough for Bay open waters, offering option for large-group trips
<p>Outrigger canoe</p> 	<ul style="list-style-type: none"> ▪ Open-hulled; up to 40' long; usually 6 paddlers ▪ Team racing is popular ▪ Well-suited to Bay open waters

Figure 2.2.4-1. cont. Water trail user groups.

Sculling



- Very narrow and long; 2, 4 or 8 rowers; long rowing oars
- Team racing is popular
- Usually done in calm waters

Whaleboat



- Wide, heavy rowboats; usually teams of 10 people (8 rowers)
- Team racing is popular
- Well-suited to touring; very stable and space for equipment

Rowboat / Dinghy



- Wide, heavy boat; usually rowed by one person
- Well-suited to touring; very stable and space for equipment

Sailboards: Windsurfer & Kitesurfer



- Bay conditions are well-suited to boardsailing activities

Windsurfer

- 6-10' long board with mast and single sail
- Need strong winds: 15-30 knots
- Racing is popular in Bay Area

Kitesurfer

- Large maneuverable kite attached via a harness; separate board straps to feet
- Need 10-25 knot winds

Boat ownership rates and boat owner use (participant-days¹⁰) can differ substantially. The concept of “participant-days” more closely reflects how many boats may be out on the Bay during any particular time period than does boat ownership. For example, kayaks comprise 31.7% of all NMSBs owned in California, but comprise 44.4% of participant-days (Cal Boating 2009). In contrast, sailboarding (windsurfing) and kiteboarding (kitesurfing) equipment comprises 3.2% of all NMSBs owned, but these boardsailing uses comprise only 1.2% of NMSB use.

Also of interest is the finding that 98.2% of those who use NMSBs in California do so five or more days per year.¹⁰ The average NMSB user statewide boated a median of 25 days per year. In San Francisco Bay, the average days per year is 21, and the median number of days per year is seven (Exhibit 2.3, Cal Boating 2009). As described earlier, less than half of the San Francisco Bay Region respondents to the 2009 Cal Boating survey use waterways in the San Francisco region as most-used waterways; many use Sacramento Basin and North Coast rivers and lakes. Also, this survey found that about one-third of most-used boats are inflatable rafts, which are normally not used on San Francisco Bay. Detailed information regarding the use patterns associated with each type of NMSB is provided below. Trends in use for the various types of NMSBs are discussed in Section 3.3.

KAYAKS

Kayaks are closed- or open-hulled boats, 12 to 19 feet long that use a double-bladed paddle. There are, generally speaking, four major types of kayaks: “sit-on-top” kayaks (open hulled), sea/touring kayaks (closed hulled kayaks with a cockpit), whitewater kayaks, and inflatable kayaks. As mentioned above, California-wide, kayaks comprise 44.4% of all NMSB use (participant days). “Sit-on-top” kayaking accounts for the majority of kayak rentals around the Bay. However, rentals and guided trips comprise only 1.5% of NMSB use statewide (Cal Boating 2009).

Relative to other NMSBs, kayaks are versatile in terms of launch site requirements. Kayakers prefer to launch from a sand or pebble beach or low-profile freeboard boarding float, but a wide range of ramps, boarding floats, and shoreline terrains are usable. In almost all cases, launches developed for other NMSB types or for trailered boats can serve kayaks as well, although with significant challenges for water entry and exit at times. For NMSB users with mobility limitations, launch site requirements are more specific. These NMSB users require sufficient water depth throughout the tidal cycles to allow the use of boarding floats, or a hard-packed, even surface with a gentle slope, such as a boat launching ramp or beach. All kayakers need space on or near the launch site to prepare equipment.

Two categories of kayaks are used on the Bay: traditional sea or touring kayaks with cockpit seats, and “sit-on-top” kayaks. Touring kayaks have space for equipment and are suitable for multi-day trips. “Sit-on-top” kayaks have a higher center of gravity than traditional sea kayaks and therefore are not as stable on the Bay's often choppy waters. To compensate for this higher center of gravity, a “sit-on-top” kayak is often wider than a traditional kayak of the same length.

¹⁰ This level of use is defined as “regular use” or “frequently used boats” in the Cal Boating study, which calculates participant-days based on this level. The only other level is lower use (not used in the past 5 years, or used 1 – 4 days per year).

This creates more wind resistance, generally resulting in a slower pace, with more energy spent when compared to a sea kayak, and shorter trips.

The distance that a kayaker on San Francisco Bay will travel varies widely, depending not only on the kind of kayak, as discussed above, but also on a suite of other factors: the experience, fitness, and time constraints of the individual or group; the purpose of the trip (e.g., sightseeing, nature appreciation, reaching a certain destination, getting a good workout), and Bay conditions. In a small (n = 11) survey of individuals with knowledge of non-motorized boating on San Francisco Bay (2M 2009), the average estimate of how many miles an “average” kayaker travels in one day on San Francisco Bay was 6.8 miles, but these responses ranged from a low of three miles to a high of 16 miles per day. When asked for an estimate of the percentage of kayakers who typically travel 0-3, 3-6, 6-8, or more than eight miles per day, the responses varied greatly as well. For those operating commercial rentals, 0-3 miles would be a typical outing for clients. For those representing clubs, all responded that eight or more miles per day would be typical. The remaining respondents leaned toward 3-6 miles more often than 6-8 miles.

Regarding speed of travel, the survey found that a reasonable average speed would be three miles per hour, consistent with the two-to-four miles per hour speed suggested in the draft WT Plan (BCDC 2007b). More experienced paddlers may travel up to four or five miles per hour. Many kayakers do not like to travel more than two hours at a time without a rest stop (and restroom).

The results of this survey and the paucity of published data on the subject of how far and how fast kayakers travel underscore the difficulty in characterizing average speeds and distances traveled by kayakers in the San Francisco Bay Area or elsewhere.

Kayaking is most popular from May to October. Kayaks are the NMSB type most likely to be used on the WT because they can be safely operated in a great variety of Bay environments and can be used most of the year. Kayakers are also the most likely WT users to embark on multi-site and multi-day trips on the Bay.

CANOES

Canoes are open-hulled boats that are paddled using a single-blade paddle. Canoeing, based on participation days of those who boat five or more days per year, comprises approximately 10.5 % of all NMSB use in California (Cal Boating 2009). Water entry requirements are similar to those for kayaks. Because they are less stable than other NMSBs, and are open vessels that can swamp in wave conditions, canoes are used less frequently in San Francisco Bay. Canoeing clubs and solo canoeists in the Bay Area occasionally paddle on the open Bay. However, they tend to keep to the quieter waters of channels, sloughs, tributary rivers and creeks along the margins of the Bay where waters are not as deep and winds and waves are not typically as strong. As with kayaking, although there are winter opportunities with calm days and abundant wildlife to observe, canoeing is most popular during the warmer, dryer weather from May to October (pers. comm. Bob Licht, 2008; pers. comm. Penny Wells, 2008).

BOARD SAILING: WINDSURFERS AND KITESURFERS

Bay conditions are well-suited to boardsailing activities. As discussed above, California-wide, sailboarding and kiteboarding comprise 1.2% of NMSB use (Cal Boating 2009) by those who

use NMSBs five or more days per year. Kitesurfing is a relatively new form of on-water recreation on the Bay. The number of kitesurfers (also referred to as “kiteboarders”) on the Bay remains relatively small partly because the skill level required creates a barrier to casual participation.

Windsurfers are 6- to 10-foot long boards with a mast and a single sail. They need strong winds to operate, preferably in the range of 15 to 30 knots. A kitesurfer is a large, maneuverable power kite¹¹ attached to the rider via a harness; the user stands on a small surfboard, wakeboard, or kiteboard (a separate board that straps to the user’s feet). Kite sizes and shapes vary depending on the user’s skill. Like windsurfers, kitesurfers need strong winds. Windsurfers and kitesurfers prefer beach launches, and kitesurfers, in particular, need sites with cross-shore winds and no obstructions on the beach. Windsurfers may also use ramps through riprap or boarding floats. Both need staging areas for rigging and de-rigging equipment, and require strong winds blowing from a certain direction with respect to the shoreline. Special needs users have launched from the South Sailing Basin dock used by the Cal Adventures program.

Windsurfing and kitesurfing occur on areas of the Bay where winds are sufficiently strong. Of the 112 sites identified in the WT Plan, approximately 16 provide suitable wind and launch conditions for windsurfers and/or kitesurfers (Cal Boating 2009). As strenuous sports where water safety is paramount, boardsailing tends to occur in the zone immediately around the launch point, rather than as linear point-to-point travel. The sailing season usually starts in March or April, and runs into September. However, many in the windsurfing community sail all year long, particularly before, during and after winter storms.

The San Francisco Boardsailing Association claims 1,600 members and represents the interests of windsurfers on San Francisco Bay. The San Francisco Kitesurfing Association does not post membership numbers, and as a fairly new sport it has relatively few participants. Some kitesurfers came from the ranks of windsurfers, and some pursue both activities.

TEAM BOATING

California-wide, dragon boating, whaleboating, outrigger canoeing and sculling comprise less than 2% total of all NMSB use (Cal Boating 2009). They are all popular team activities, most often involving racing. In 2006 - 2007, there were an estimated 9,000 club boating participants in the Bay Area (Cal Boating 2009). Use of dragon boats and sculls is generally limited to use areas around the Bay where wind and water conditions are calm and most conducive to that type of boating. Whale boats and outrigger canoes are more stable in rough waters. Outrigger canoe racing, along with dragon boat racing, has experienced rapid growth in the Bay Area in the last five to ten years (BCDC 2006a).

Dragon boats have twenty paddlers, ten to a side. A drummer sets the pace and a twenty-second team member is responsible for steering. Dragon boats are open-hulled and usually about 45-feet long. Some hull designs are stable enough for Bay open waters, offering the option for large-group trips. Dragon boats require a beach, boarding float or sufficient dock space to moor a 45-foot boat. Launch sites adjacent to training areas are preferred, and a dock tie space is needed

¹¹ A power kite or traction kite is a large kite designed to provide significant pull to the user.

for storage. Most dragon boat clubs are focused on sprint racing. The California Dragon Boat Association (CDBA), based in the Bay Area, has at least seven clubs that practice year-round on a weekly basis with about 1,000 members, and an additional 700 non-members participating in events.

Outrigger canoes are open-hulled boats up to 40-feet long; the most popular-sized outrigger canoe is propelled by six paddlers. Outriggers are pulled up on the beach by hand. Beach space sufficient to launch a 40-foot boat is required for outrigger canoes. Outrigger canoes also need rigging space. Outrigger canoe clubs prefer launches adjacent to training areas for racing teams and on-site boat storage. There are about a dozen outrigger canoe clubs around the Bay that promote the recreational and cultural values of the sport, and train crews year-round for international races that range from 500-meter sprints to 30-mile marathon events.

Whaleboats are heavy, open-water boats rowed by teams of 10 (eight rowers), and historically used for life-saving and whale hunting. Whale boat teams prefer launch sites adjacent to training areas for racing teams, and dock tie space for storage. Whaleboat use occurs around the entire Bay but is concentrated in the more urban areas, where there is storage space and organized groups exist. There are several whaleboat teams in the Bay Area with public agency and corporate sponsors. Teams practice year-round in preparation for the racing season, which consists of around ten races, and lasts from May through October. Whaleboats are well-suited to touring because they are very stable and have space for equipment.

Sculls are very narrow, long, open-hulled vessels with long rowing oars. They are used in racing, and are crewed by two, four, or eight rowers. Sculls require a low-profile (freeboard) boarding float or dock for launching. Teams prefer launches adjacent to training areas, and on-site boat storage. Scullers require sites protected from winds and with calm waters. A single-person scull is used for training.

ROWBOATS AND DINGHIES

Rowboats and dinghies on the Bay are small, open boats sometimes carried as a tender, lifeboat, or pleasure craft on a larger vessel. They are relatively small boats of shallow draft with cross thwarts for seats and rowlocks for oars. They are well-suited to touring because they are wide and heavy, very stable, and have space for equipment. Depending on their size and design, these craft may be rowed by one person or small groups. Although California-wide 8% of all NMSB use by those who boat five or more days per year consists of rowboats and dinghies (Cal Boating 2009), rowboating on the Bay as recreation is a relatively minor activity in terms of overall numbers.

Non-motorized rowboats are sometimes used by individuals for fishing and nature observation in the sloughs and creeks in the North and South Bay. The Dolphin Swimming and Boating Club located in Aquatic Park in San Francisco is one organization that offers a variety of rowing activities, including participation in rowing races and trips.

EXISTING NMSB ACCESS ONTO THE BAY

Recreational NMSB use on San Francisco Bay is essentially a dispersed recreation activity. With the exception of established exclusion zones enforced by the USCG (see Section 3.4) and the

U.S. Fish and Wildlife Service (USFWS), no agency or specific baywide program directs boaters where, or where not, to travel. Existing NMSB access onto the Bay consists of over 135 sites identified during the development of the WT Plan between 2005 and 2007. The types of NMSB access, facilities, and geographic locations vary greatly among these sites. There are also many other informal sites to which a portable craft, such as a kayak or canoe, could be carried and launched.

ACCESS TYPES

There are two types of access onto the Bay for small, non-motorized boats: launch sites and destination sites. Both launch and destination sites may be designated as WT trailheads. A launch site is a shoreline location where a NMSB can gain access to the Bay or a waterway connected to the Bay. Launch sites are reachable by land, and users must be able to transport their NMSBs to the water's edge.

A destination site (also referred to as a landing site) is a shoreline location where NMSBs can land, but from which they cannot or should not be launched initially. Most of these destination sites are not accessible by car or within a reasonable distance for boaters to transport their boats to the launch. A destination site needs to have facilities (such as a boat launching ramp, boarding float, or beach) for landing and then re-launching a NMSB.

AVAILABLE FACILITIES

Existing sites vary in terms of the level of development and management they offer in support of non-motorized boating. Most sites support multiple recreational uses. They range from the highly-developed facilities available at many marinas to the simple facilities common in certain public access areas.

Basic access onto the water consists of a place to launch, whether it is a beach, a dock, ramp, tidal steps, piers, a floating dock, or other means. Parking is usually another essential component of access for NMSB users. Access can be enhanced with a variety of improvements and services, such as restrooms, boat drop-off parking zones, equipment storage, boat houses, transient docking, overnight accommodations (such as a hostel, campsite, historic ship, hotel, or bed and breakfast), rigging areas, fresh water for washing gear, individual or group picnic areas, a restaurant or café, rental concessions, trash and recycling containers, bicycle racks, lighting, emergency phones, landscaping, trail system connections, trailhead directional/signs from the local street network, and safety information and regulatory signs. Some access locations or facility conditions are less favorable for NMSBs. For example, a site might have only a boat launching ramp best-suited to launching motorized watercraft, and/or lack parking or restrooms.

EXISTING ACCESS SITE LOCATIONS

The 135 identified existing or planned launch and destination sites are located in waterfront parks (50% of all sites), marinas and harbors (17%), sites with public launch ramps or floats (13%), public access areas (12%), and to a lesser extent, wildlife refuges (1%) and privately owned sites (7%) (BCDC 2007b). Management of the many access locations around the Bay is provided by the site owners. Some private businesses – most often shoreline restaurants– offer use of their docks or ramps for a launch fee or are free to their clients.

FIGURE 2.2.4-2 EXISTING ACCESS SITES

Geographically, the access sites are clustered primarily around the central Bay, from southern Marin and Contra Costa Counties south to Redwood City and San Leandro (see Figure 2.2.4-2). Most of these sites are in, or near, urban areas, and this portion of the Bay is heavily used for commercial shipping, ferry transportation and all types of recreational boating. In comparison, the South Bay, San Pablo Bay and Suisun Marsh have fewer access points. Access in these areas is physically constrained by the shallowness of the Bay and the potential for becoming stranded in mudflats at low tide.

Existing launch and destination sites vary widely in terms of their level of development. Undeveloped sites may consist solely of a beach or other shoreline that allows access to the water, and some type of available nearby parking. Formal launch and destination sites may include a hardened shoreline, boat launching ramps or boarding floats, docks or other facilities for boat storage, rental and food concessions, restrooms, picnic or camping facilities, parking areas, rigging and boat washing areas, access

to other recreational amenities such as land-side trails, access to public transportation, information and signage, and educational opportunities.

2.3 Water Trail Plan

2.3.1 OVERVIEW OF THE WATER TRAIL PLAN

The WT Plan is a guide to trail implementation for the agencies and organizations that will develop and manage WT access points and programs, as well as for trail proponents and other stakeholders involved in trail implementation. The WT Plan outlines principles, guidelines, strategies, and recommendations for implementation of the WT. The Plan also addresses the opportunities and challenges involved in developing a trail that has both land and water components in the San Francisco Bay Area – a large and complex setting for a regional recreational access project. The recommended policies and procedures in the Plan define how the WT will take shape over time by guiding trail planning, development and management on organizational, program- and project-specific levels. The WT Plan is currently in Final Draft form; the Final Draft was completed in September 2007 (BCDC 2007b).

The Final EIR must be certified and the Final WT Plan approved by the Conservancy at a public meeting before implementation of the WT Plan would begin. Initial implementation of the WT Plan would focus on trailhead designation and development of educational, outreach, and signage materials. It is anticipated that sites would be prioritized so that trailheads with greater support or interest from the owner/manager for inclusion in the WT and fewer potential environmental or safety concerns would be designated first. Designation would include

development of appropriate signage and development of any necessary educational and outreach materials. Prioritizing potential trailhead designation decisions in this manner would accelerate the development of the WT network in the early stage of implementation.

2.3.2 WATER TRAIL SITES

Potential WT sites are identified in the WT Plan. The WT Plan allows for the addition of new sites that meet the WT Plan criteria (including an appropriate level of project-specific CEQA documentation, as required by existing CEQA regulations) in the future. Initially, the vast majority of WT access sites would be designated from existing and planned access points. Of the more than 135 existing access points onto the Bay, 112 have been identified as WT “Backbone Sites” in the Plan (Figures 2.1.4-1A and 2.1.4-1B and Table 2.3.2-1), meaning that they are thought to be potentially suitable for inclusion in the WT, although not all trailheads can be used for all NMSB types. The environmental analysis provided in this document focuses on the 112 Backbone Sites, while establishing the framework for the consideration of other, currently unidentified sites.

BACKBONE SITES

The 112 Backbone Sites were recommended for inclusion in the WT during the planning process. They do not comprise a final WT network. The WT network would be gradually established over time as each Backbone Site (and possible new site) is considered for designation as a WT Trailhead. This starting pool of Backbone Sites includes sites that fulfill two basic criteria. These sites:

1. Have launch facilities or planned facilities (e.g., ramp, float, etc.) or launch areas (e.g., a beach) that are used for NMSB access or are planned for this use.
2. Are open to the public.

Some access sites are privately owned. These sites are potentially open to the public but would be subject to all conditions imposed by the site owner, and use of these sites may require patronage of a business. There may also be fees for the public to use a site.

Some existing and planned sites are not included in the Backbone Site list because they have one or more conditions that could preclude inclusion in the WT. These conditions are:

- The site lacks necessary facilities and does not have the space or capacity to ever provide any of these additional amenities, and is unlikely to be an interesting or useful destination site
- Property ownership or rights are unclear for the site, or
- The site owner or manager does not want the site to be part of the WT

The 112 Backbone Sites include 12 destination sites and 100 launch sites, as defined under “Access Types,” above. Of the destination sites, seven exist already and five are planned. Of the launch sites, 88 exist and 12 are planned. Combining all launch and destination sites, 95 are existing and 17 are planned.

TABLE 2.3.2-1 WATER TRAIL BACKBONE SITES

Site I.D.	Site Name	E/P, L/D*1	HOS?	Ownership*2	City/County	Launch Type	General Site Category	Manager
Alameda County								
A1	Albany Beach	EL		public	Albany	sand beach	waterfront park	East Bay Regional Park Service (EBRPD)
A2	Berkeley Marina, Ramp	EL	Y	public	Berkeley	ramp	marina/harbor	Berkeley Marina, Harbormaster
A4	Point Emery	EL		public	Emeryville	sand beach	waterfront park	City of Emeryville
A5	Shorebird Park	EL		public	Emeryville	pebble beach	waterfront park	City of Emeryville
A6	Emeryville City Marina	EL	Y	public	Emeryville	ramp	marina/harbor	City of Emeryville
A8	Middle Harbor Park	EL	Y	public	Oakland	sand beach	waterfront park	EBRPD/Port of Oakland
A9	Jack London Square/CCK	EL	Y	public	Oakland	float	public boat launch ramp/float	City of Oakland
A11	Estuary Park/Jack London Aquatic Center	EL	Y	public	Oakland	ramp, float	waterfront park	C. of Oak., Parks and Rec./ Jack London Aq. Cen.
A12	Grand Avenue Boat Ramp	EL	Y	public	Alameda	ramp, float	public boat launch ramp/float	City of Alameda
A14	Robert Crown Memorial State Beach	EL	Y	public	Alameda	sand beach	waterfront park	EBRPD
A15	Encinal Launching and Fishing Facility	EL	Y	public	Alameda	ramp, float	public boat launch ramp/float	City of Alameda
A18	Doolittle Drive; Airport Channel	EL		public	Oakland	ramp	waterfront park	EBRPD
A20	San Leandro Marina	EL	Y	public	San Leandro	ramp, float	marina/harbor	San Leandro Marina, Harbormaster
A22	Eden Landing Ecological Reserve	PL		public	Hayward	planned ramp	refuge/reserve	CA Dept of Fish and Game
A24	Jarvis Landing	EL		private	Newark	ramp	privately owned (business)	US Fish and Wildlife Service/ Cargill
A25	Tidewater Boathouse	PL		public	Oakland	planned float	public boat launch ramp/float	EBRPD
A26	Berkeley Marina, Small Boat Launch	EL	Y	public	Berkeley	dock	public boat launch ramp/float	Berkeley Marina, Harbormaster
A27	Coyote Hills	PD		public	Fremont	N/A	refuge/reserve	EBRPD/Alameda Co. Flood Control
A28	Elmhurst Creek	EL		public	Oakland	creek bank	public access area	EBRPD
A30	Hayward's Landing	PD		public	Hayward	N/A	refuge/reserve	EBRPD

TABLE 2.3.2-1 WATER TRAIL BACKBONE SITES

Site I.D.	Site Name	E/P, L/D*1	HOS?	Ownership*2	City/County	Launch Type	General Site Category	Manager
Contra Costa County								
CC1	Martinez Marina	EL	Y	public	Martinez	ramp, float	marina/harbor	City of Martinez; Westrec
CC2	Carquinez Strait Reg. Shoreline (Eckley Pier)	EL	Y	public	Martinez	pebble beach	waterfront park	EBRPD
CC5	Rodeo Marina	PL		private	Contra Costa County	no access	marina/harbor	Bennett's Marina, Harbormaster
CC6	Pinole Bay Front Park	EL	Y	public	Pinole	pebble beach	waterfront park	City of Pinole
CC8	Point Molate Beach Park	PL		restricted	Richmond	N/A	waterfront park	City of Richmond
CC9	Keller's Beach	ED	Y	public	Point Richmond	sand beach	waterfront park	EBRPD
CC10	Ferry Point	EL	Y	public	Point Richmond	sand beach	waterfront park	EBRPD
CC11	Boat Ramp Street Launch Area	EL		public	Richmond	ramp	public boat launch ramp/float	City of Richmond
CC14	Richmond Municipal Marina	EL	Y	public	Richmond	ramp, float	marina/harbor	City of Richmond, Westrec
CC15	Marina Bay Pk. & Rosie the Riveter Memorial	EL		public	Richmond	riprap, dirt beach	waterfront park	City of Richmond, owned by National Park Service (NPS)
CC16	Shimada Friendship Park	EL	Y	public	Richmond	steps	waterfront park	City of Richmond
CC17	Barbara & Jay Vincent Park	EL	Y	public	Richmond	sand beach	waterfront park	City of Richmond
CC19	Point Isabel Regional Shoreline	EL	Y	public	Richmond	dirt beach	waterfront park	EBRPD
CC20	SS Red Oak Victory	PD		private	Richmond	ship	privately owned (business)	SS Red Oak Vict. and Richm. Mus. of History
CC21	Point Pinole	PD		public	Pinole	N/A	waterfront park	EBRPD
CC22	Bay Point Regional Shoreline	PL		public	Contra Costa County	N/A	waterfront park	EBRPD
CC23	Rodeo Beach	PL		public	Contra Costa County	sand beach	waterfront park	EBRPD
Marin County								
M1	Kirby Cove	ED	Y	public	Sausalito	pebble beach	waterfront park	NPS, Golden Gate National Recreation Area
M2	Horseshoe Cove	EL	Y	public	Sausalito	sand beach	waterfront park	NPS, Golden Gate National Recreation Area
M3	Swede's Beach	ED		public	Sausalito	sand beach	waterfront park	City of Sausalito, Dept of Parks and Rec

TABLE 2.3.2-1 WATER TRAIL BACKBONE SITES

Site I.D.	Site Name	E/P, LD*1	HOS?	Ownership*2	City/County	Launch Type	General Site Category	Manager
M4	Turney Street Public Boat Ramp	EL		public	Sausalito	ramp	public boat launch ramp/float	City of Sausalito, Dept of Parks and Rec
M5	Dunphy Park	EL	Y	public	Sausalito	pebble beach	waterfront park	City of Sausalito, Dept of Parks and Rec
M6	Schoonmaker Point	EL	Y	public	Sausalito	sand beach	waterfront park	Schoonmaker Point Marina, Harbormaster
M8	Clipper Yacht Harbor	EL		private	Sausalito	ramp	marina/harbor	Clipper Yacht Harbor, Harbormaster
M10	Shelter Point Business Park	EL	Y	public	Mill Valley	float	public boat launch ramp/float	City of Mill Valley, Dept of Parks and Rec
M11	Bayfront Park	EL	Y	public	Mill Valley	dirt beach, float	waterfront park	City of Mill Valley, Dept of Parks and Rec
M13	Brickyard Park	EL		public	Strawberry	dirt beach	waterfront park	Strawberry Recreation District
M16	Richardson Bay Park/ Blackie's Pasture	EL		public	Tiburon	sand beach	waterfront park	City of Tiburon
M17	Angel Island State Park	ED	Y	public	Marin County	sand beach	waterfront park	CA Dept of Parks and Rec
M19	Sam's Anchor Café	ED		private	Tiburon	float	privately owned (business)	Sam's Anchor Café
M25	Higgins Dock	PL		public	Corte Madera	no access	public boat launch ramp/float	City of Larkspur
M27	Bon Aire Landing	EL		public	Larkspur	float	public boat launch ramp/float	City of Larkspur
M28	Marin Rowing Association Boathouse	EL		public	Larkspur	float	public boat launch ramp/float	City of Larkspur
M29	Remillard Park	EL		public	Larkspur	pebble beach	waterfront park	City of Larkspur
M30	San Quentin	EL		public	San Rafael	sand beach	waterfront park	County of Marin
M31	Jean & John Starkweather Shoreline Park	EL		public	San Rafael	sand beach	waterfront park	City of San Rafael
M33	Harbor 15 Restaurant	ED		private	San Rafael	ramp	privately owned (business)	Harbor 15 Restaurant
M35	Loch Lomond Marina: Ramp	EL	Y	private	San Rafael	ramp	marina/harbor	Loch Lomond Marina
M36	Loch Lomond Marina: Beach	EL	Y	private	San Rafael	dirt beach	marina/harbor	Loch Lomond Marina
M38	McNear's Beach	EL	Y	public	San Rafael	sand beach	waterfront park	County of Marin
M39	China Camp State Park	EL	Y	public	San Rafael	sand beach	waterfront park	CA Dept of Parks and Rec
M40	Bull Head Flat	EL	Y	public	San Rafael	pebble beach	waterfront park	CA Dept of Parks and Rec
M41	Buck's Landing	EL		private	San Rafael	float	privately owned (business)	Buck's Landing

TABLE 2.3.2-1 WATER TRAIL BACKBONE SITES

Site I.D.	Site Name	E/P, L/D*1	HOS?	Ownership*2	City/County	Launch Type	General Site Category	Manager
M43	John F. McInnis Park	EL		public	San Rafael	float	waterfront park	County of Marin
M47	Black Point Boat Launch	EL	Y	public	Novato	ramp, float	public boat launch ramp/float	County of Marin
Napa County								
N1	Cutting's Wharf	EL	Y	public	Napa County	ramp, float	public boat launch ramp/float	Napa County
N2	JFK Memorial Park	EL	Y	public	Napa	ramp, float	waterfront park	City of Napa
N6	Napa Valley Marina	EL	Y	private	Napa	ramp	marina/harbor	Napa Valley Marina
N7	Green Island Boat Launch Ramp	PL		public	American Canyon	ramp	public boat launch ramp/float	CA Dept of Fish and Game
N8	Riverside Drive Launch Ramp	EL		public	Napa	ramp	public boat launch ramp/float	City of Napa
Santa Clara County								
SC2	Alviso Marina	PL		public	San Jose	planned ramp	waterfront park	County of Santa Clara
SC3	Palo Alto Baylands Launching Dock	EL	Y	public	Palo Alto	ramp, float	waterfront park	City of Palo Alto
San Francisco County								
SF1	Candlestick Point State Recreation Area	EL	Y	public	San Francisco County	sand beach	waterfront park	CA Dept of Parks and Rec
SF2	India Basin Shoreline Park	EL	Y	public	San Francisco	pebble beach	waterfront park	San Francisco Dept of Parks and Rec
SF4	Islais Creek	EL		public	San Francisco	pebble beach	waterfront park	Port of San Francisco
SF6	The "Ramp"	ED		private	San Francisco	ramp	privately owned (business)	Ramp Restaurant
SF7	Pier 52 Boat Launch	EL	Y	public	San Francisco	ramp	public boat launch ramp/float	Port of San Francisco
SF8	South Beach Harbor (AKA Pier 40)	EL		private	San Francisco	float	marina/harbor	South Beach Harbor, Harbormaster
SF9	Treasure Island	EL		public	San Francisco	ramp	public access area	Treasure Island Development Authority for the City of San Francisco (recheck – as of Jan 2010 still owned by Navy)(
SF10	Aquatic Park	EL	Y	public	San Francisco	sand beach	waterfront park	NPS, San Francisco Maritime National Historical Park

TABLE 2.3.2-1 WATER TRAIL BACKBONE SITES

Site I.D.	Site Name	E/P, L/D*1	HOS?	Ownership*2	City/County	Launch Type	General Site Category	Manager
SF11	Gas House Cove (aka Marina Green)	EL		public	San Francisco	float	marina/harbor	City of San Francisco
SF12	Crissy Field	EL	Y	public	San Francisco	sand beach	waterfront park	NPS, Golden Gate National Recreation Area
SF13	Brannan St Wharf	PL		N/A	San Francisco	N/A	public boat launch ramp/float	Port of San Francisco
SF14	Northeast Wharf Park	PL		N/A	San Francisco	N/A	waterfront park	Port of San Francisco
San Mateo County								
SM2	Ravenswood Open Space Preserve	EL		public	Menlo Park	sand beach	waterfront park	Midpeninsula Regional Open Space District
SM4	Redwood City Municipal Marina	EL	Y	public	Redwood City	ramp	marina/harbor	Port of Redwood City, Harbormaster
SM6	Docktown Marina	EL		private	Redwood City	ramp	marina/harbor	Docktown Marina, Harbormaster
SM9	Redwood Shores Lagoon	EL		private	Redwood Shores	dirt beach	waterfront park	Redwood Shores
SM11	Beaches on the Bay	EL		public	Foster City	sand beach	waterfront park	Foster City
SM12	Foster City Lagoon Boat Park	EL		public	Foster City	ramp	waterfront park	Foster City
SM13	East 3rd Ave	EL	Y	public	Foster City	sand beach	waterfront park	City of San Mateo
SM16	Seal Point Park	EL	Y	public	San Mateo	ramp	waterfront park	City of San Mateo
SM17	Coyote Point, Marina	EL	Y	public	San Mateo	ramp	marina/harbor	County of San Mateo, Parks and Rec Dept
SM18	Old Bayshore Highway	EL		public	Burlingame	sand beach, riprap	public access area	N/A
SM20	Colma Creek/Genentech	EL		public	So San Francisco	creek bank	public access area	N/A
SM21	Oyster Point Marina	EL	Y	public	So San Francisco	sand beach, ramp, float	marina/harbor	San Mateo County Harbor District
SM22	Brisbane Marina	EL	Y	public	Brisbane	riprap	marina/harbor	City of Brisbane
SM23	Coyote Point, Beach	EL	Y	public	San Mateo	sand beach	waterfront park	County of San Mateo, Parks and Rec Dept
SM24	Westpoint Marina	PL		private	Redwood City	ramp	marina/harbor	Westpoint Marina
SM25	Corkscrew Slough Viewing Platform	PD		public	Redwood City	dock	refuge/reserve	US Fish and Wildlife Service

TABLE 2.3.2-1 WATER TRAIL BACKBONE SITES

Site I.D.	Site Name	E/P, L/D*1	HOS?	Ownership*2	City/County	Launch Type	General Site Category	Manager
Solano County								
So1	Brinkman's Marina	EL	Y	public	Vallejo	ramp, float	public boat launch ramp/float	City of Vallejo
So2	California Maritime Academy	EL		public	Vallejo	ramp	public boat launch ramp/float	CA Maritime Academy (SF State University)
So5	Belden's Landing	EL	Y	public	Fairfield	ramp, float	public boat launch ramp/float	Solano County
So7	Matthew Turner Park	EL	Y	public	Benicia	pebble beach	waterfront park	City of Benicia, Parks and Comm. Serv.
So8	West 9th Street Launching Facility	EL	Y	public	Benicia	ramp, float	waterfront park	City of Benicia, Parks and Comm. Serv.
So9	Benicia Point Pier	EL	Y	public	Benicia	pebble beach	waterfront park	City of Benicia, Parks and Comm. Serv.
So10	Benicia Marina	EL	Y	public	Benicia	ramp	marina/harbor	Benicia Marina, Harbormaster
So12	Suisun City Marina	EL	Y	public	Suisun City	ramp, float	marina/harbor	Suisun City
Sonoma County								
Sn3	Hudeman Slough	EL		public	Sonoma County	ramp, float	public boat launch ramp/float	Sonoma County Regional Parks Department
Sn5	Papa's Taverna/ Lakeville Marina	EL	Y	private	Petaluma	ramp	privately owned (business)	Papa's Taverna; Lakeville Marina, Harbormaster
Sn6	Petaluma Marina	EL	Y	public	Petaluma	ramp	marina/harbor	Petaluma Marina, Harbormaster
Sn7	Petaluma River Turning Basin	EL		public	Petaluma	float	public boat launch ramp/float	N/A
*1	ED = Existing Destination							
	EL = Existing Launch							
	PD = Planned Destination							
	PL = Planned Launch							
	N/A = Information not available							
*2	Use of private sites by NMSBs is strictly at the discretion of the site owner, and subject to all conditions imposed by the site owner (e.g., may require patronage of a business).							

Some sites have natural features (e.g., beaches) that are suitable for, and currently used by persons with disabilities (e.g., Environmental Traveling Companions launches from Schoonmaker Point). In addition, some sites have shoreside facilities, such as restrooms and parking, that are ADA-accessible, or other features, such as the cement ramp at Barbara and Jay Vincent Park in Richmond (CC17), that may be suitable for use by any persons with mobility impairment.

HIGH OPPORTUNITY SITES

Fifty-seven of the WT Backbone Sites are designated by the WT Plan as “High Opportunity Sites” (HOSs). Sites meeting the HOS criteria would be the simplest sites to designate as trailheads and incorporate into the WT network. As described in the WT Plan, an HOS is a site where:

1. Launch facilities do not require additional improvements beyond signage.
2. No major management issues (e.g., user conflicts, wildlife disturbances, health risks from poor water quality) are expected to be caused by trailhead designation that would [in turn] require further site assessment, planning or management changes prior to designation.

The 57 potential HOSs identified in the WT Plan are shown on Figure 2.3.2-1. Focusing initial trail development efforts on these High Opportunity Sites would enable WT managers to designate many trailheads relatively quickly because these sites only require WT-related signage, and do not have significant challenges that would complicate site planning and management. These sites can be promoted as the WT early in the implementation process and would help refine the process of trailhead designation.

OTHER (NON-HOS) BACKBONE SITES

Fifty-five sites were retained in the general Backbone Site category. During the trailhead designation process, more detailed evaluation of any of the 112 sites could result in a reclassification that could move non-HOSs into the HOS group or vice-versa. The only real consequence of reclassification is that HOSs are likely to be designated first. All sites will be evaluated under CEQA as appropriate to their existing conditions or planned development.

NEW SITES

It is anticipated that new sites will continue to be developed at either the initiative of site owners, or due to the urging of NMSB users. The WT may also promote the creation of certain new access sites to property owners, if it becomes clear at a future point that such sites would greatly enhance the benefits of the WT or resolve a use conflict. New sites would be evaluated using the same process as for Backbone Sites, including the criteria set forth in the WT Plan. The evaluation would be conducted during the planning phase for the new site, to ensure that it is constructed and operated in a manner that makes it suitable for inclusion in the WT.

Site numbers correspond to Table 2.3.2-1 in the Project Description



**Figure 2.3.2-1
Proposed Water Trail
High Opportunity Sites**

Bay Water Trail GIS data provided by BCDC

GECO Environmental Consulting



2.3.3 WATER TRAIL DEVELOPMENT AND MANAGEMENT STRATEGIES

The WT Plan includes a ‘toolbox’ of strategies. These WT Plan development and management strategies are intended to achieve the goals of the WT; address trail-related access, wildlife and habitat, safety and education issues and needs in a way that would minimize impacts; and enhance the benefits of the WT. The strategies would provide guidance for a diverse audience that would include WT staff and site owners; local, regional, state and federal agencies; non-governmental organizations; and the public. The WT strategies do not modify existing land and resource management laws and regulations. While all strategies apply to all sites insofar as they provide guidance, the application of strategies will differ among sites depending on the specific circumstances of each site.

The strategies were developed as part of the WT Plan, which included input from a large variety of stakeholders, and thus incorporate the needs and concerns of various stakeholders while focusing on the overall priorities laid out in the WT Act. The suite of strategies developed in the WT Plan is intended to be comprehensive enough to facilitate diverse access opportunities and experiences, accommodate needs and constraints of site managers, and provide solutions for the broad range of WT conditions and issues. The strategies in the WT Plan are not mitigation measures (they are part of the project) but in some cases mitigation may include recommendations to modify a strategy, such as adding elements not included in the original strategy description (see “Implementation of Strategies,” below, for more details).

DESCRIPTION OF STRATEGIES

Twenty-four strategies were developed as part of the WT Plan. The strategies can be grouped into the following six categories, each of which is discussed in more detail below:

- Trailhead Location (Strategies 1 and 2)
- Trailhead Facilities (Strategies 3, 5, 8, 9, 10, 11, 12, and 13)
- Wildlife Protection (Strategies 3, 14, 15, 16, 23 and 24)
- Education and Outreach (Strategies 17, 18, 19, 20, 21, and 22)
- Trailhead Maintenance and Operation (Strategies 6, 7, 22, and 24)
- Overall Coordination with Existing Policies, Plans, Programs, and Regulations (Strategy 4)

Some strategies would affect multiple WT development or implementation factors, particularly Strategies 3 and 24, which seek to balance development and use of trailhead facilities with environmental protection. The 24 strategies specifically address four of the eight priorities identified in the WT Act: (1) improving access within and around the Bay; (2) creating site-to-site linkages; (3) protection of wildlife; and (4) providing for overnight accommodations. The other four priorities identified in the WT Act include navigational safety, homeland security, respect for private property owners’ rights, and minimizing adverse effects on agricultural operations. These factors would be addressed through appropriate application of the strategies; for example, siting of locations would consider potential impacts to agricultural operations, and WT public outreach materials would clearly identify privately-owned sites. The strategies include both conceptual, planning-level guidance, and practical implementation recommendations. The 24 strategies are summarized in Table 2.3.3-1; the complete description of each strategy is provided in Appendix D.

TABLE 2.3.3-1 STRATEGIES FOR WT IMPLEMENTATION

No.	Name	Strategy
1	Trailhead Location	Seek opportunities to increase capacity at existing launches or create new access, especially at sites that are most desirable to WT users and where adverse impacts to wildlife and habitat or navigational safety are unlikely.
2	Linking Access Points	Seek opportunities to link trailheads to one another and to other regional trails (e.g., the Bay Trail) and create linkages that serve different trail users' needs and interests.
3	Improvements Consistent with Site Characteristics	Match the type and design of trail-related improvements to the site conditions and likely trail user groups. Ensure that the level of use accommodated provides a high-quality recreational experience, protects the environment and ensures user safety.
4	Consistency with Policies, Plans and Priorities	Coordinate plans for trailhead development, management, and use to be consistent with existing policies, plans and priorities of land and resources managers at and around trailheads.
5	Design Guidelines	Develop and update, as needed, design guidelines for WT-oriented access improvements.
6	Management Resources	Match the facility improvements and use to the management resources available for long-term maintenance and management of the facilities.
7	Maintenance and Operations	Develop a plan for maintenance and operation of trailhead facilities and identify who will be responsible.
8	Parking	Provide parking or drop-off zones as close as possible to launch points, extend parking time to at least four hours, with overnight parking where possible. Where necessary, restrict the number of users and protect shoreline visual character in locating parking.
9	Restrooms	Provide restroom facilities where feasible and appropriate.
10	Accessibility	Develop and improve launch facilities to be in compliance with the Americans with Disabilities Act (ADA) ¹²
11	On-site Equipment Storage	Where feasible and appropriate, provide storage areas and facilities for NMSBs and associated equipment.
12	Non-Profit Boating Clubs and On-site Equipment Concessions	Promote and encourage publicly accessible non-profit boating clubs and/or on-site equipment concessions at appropriate trailheads and facilitate their provision of information on site-specific safety and security, and wildlife and habitat issues.
13	Overnight Accommodations	Develop new campsites at or near trailheads where consistent with land managers' plans and resources. Coordinate with land managers, organizations and businesses to provide overnight accommodations on the trail in motels, hostels, historic ships, etc.
14	Site Review	Conduct, coordinate or sponsor periodic reviews of trailheads to identify site-specific issues such as user conflicts, overuse of facilities or non-compliance with rules, and use this information to improve site management or facilities.
15	Habitat Restoration and Access	Seek opportunities to coordinate trailhead development with habitat restoration, enhancement or creation.
16	Monitoring Impacts	Sponsor pilot projects to monitor trail impacts in different habitats to develop and test effective and consistent monitoring methods and learn about impacts and ways to avoid them. Monitor wildlife and habitat conditions prior to, during, and after inclusion of the site as part of the WT.
17	Outreach, Educational and Interpretative Signage	Provide signage and other media at and near trailheads, consistent with other WT outreach and education materials. Materials should be site-specific in terms of users groups, natural, cultural and historic resources, safety issues and rules.

¹² The wording of this strategy would be corrected, as needed, in the Final WT Plan to reflect compliance with pending ADA-ABA guidelines.

TABLE 2.3.3-1 STRATEGIES FOR WT IMPLEMENTATION

No.	Name	Strategy
18	Outreach and Coordination	Coordinate with and conduct outreach to paddleboat and boardsailing teachers and guides, outfitters, and other WT-related businesses, agencies and organizations to make them aware of boating practices consistent with the WT ethic and policies.
19	Educational Media	Provide a guidebook for using the WT, a WT website, and brochures, maps and other educational media for WT use.
20	Guided Trips	Provide guided trips or tours led by docents or rangers.
21	Boater-to-Boater Education	Coordinate with agencies and boating organizations to facilitate and enhance existing boater-to-boater outreach and education, and incorporate WT-supported information and messages. Train volunteers and WT staff to educate boaters, especially during high-use times of the year.
22	Trailhead Stewards	Recruit and coordinate volunteers to be trailhead stewards to help maintain and manage trailheads.
23	Training for Enforcement	Where feasible and appropriate, provide training to local law enforcement on wildlife and environmental regulations to identify or prevent violations at trailheads.
24	Limitations on Trailhead Use	Establish limits on the number of WT users at a site to prevent impacts to wildlife, habitat, or damage to facilities. Enforce this through either parking restrictions or limits on boating activities and periodic closures when necessary.

LOCATION

Strategies 1 and 2 seek to improve NMSB access opportunities through increasing the capacity at existing sites, adding new sites, and improving linkages between sites and with other regional trails. The two strategies also provide guidance on priorities. Efforts to increase site use capacity or create new sites would be focused on locations that are close to desirable non-motorized small boating conditions and trip destinations, and in areas where trail-related adverse impacts to wildlife and habitat or navigational safety are unlikely. These strategies would be implemented by a combination of site owners and operators, the Project Management Team (PMT), the Advisory Committee, as well as other stakeholders (through participation in Advisory Committee meetings and/or attendance at PMT meetings). (See Section 2.4.2 for definitions of the PMT and Advisory Committee.)

TRAILHEAD FACILITIES

NMSB users have specific access needs and preferences. A fundamental goal of the WT is to improve access facilities for NMSBs. Basic launch requirements for each type of NMSB were described in Section 2.2.3. Strategies 3, 5, 8, 9, 10, 11, 12, and 13 address specific aspects of facilities planning and design, and identify priorities for certain types of facilities. The facilities emphasized in these strategies are those that were identified by NMSB users and organizations as the facilities that would most enhance a boater's likelihood of using a site, and the safety and quality of the experience at a site. These strategies call for:

- Site design that is consistent with site characteristics
- Development of design guidelines
- Provision of facilities that are accessible to those with disabilities, as feasible, and
- As appropriate to the site, provision of parking, restrooms, on-site boat storage, on-site equipment concessions, and non-profit boat clubs

Boarding floats and boat launching ramps would be developed and constructed in conformance with the pending federal ADA-ABA Accessible Guidelines for recreational boating facilities. There are existing guidelines for many types of amenities that may be constructed at a launch or destination site, such as parking areas, restrooms, picnic areas, walkways, railings, and more, that would apply to and be implemented for construction of any such amenities.

These strategies would be implemented by the PMT in collaboration with the Advisory Committee, site owners and managers, and other interested stakeholders.

WILDLIFE PROTECTION

While most strategies address wildlife protection in some manner (to ensure that implementation of the strategies does not cause environmental harm), Strategies 3, 14, 15, 16, 23 and 24 specifically focus on wildlife and environmental protection. The strategies encompass a range of options for ensuring wildlife and environmental protection: design of facilities consistent with local conditions, site environmental review, monitoring of potential impacts, identification of opportunities for habitat restoration, training of local law enforcement to recognize violations of environmental laws, and potential restrictions on site use (if warranted based on the environmental sensitivity of a site). These strategies would be implemented by the site owners and operators, in collaboration with NMSB user groups, non-governmental wildlife and environmental protection organizations, resource and permitting agencies, researchers, and other interested stakeholders.

It should be noted that potential wildlife and other environmental impacts at a trailhead (such as damage to sensitive vegetation) or on the Bay (such as disturbance of wildlife) may be caused by existing NMSB use of that site and/or the many other activities that also occur on the Bay. At multi-use trailheads, for example, other recreationists, including motorized boat users, would pose many of the same concerns that would be posed by NMSB users. This EIR focuses on the potential impacts associated with increased NMSB use *attributable to implementation of the WT Plan*. As discussed earlier, the increase in NMSB use attributable to the implementation of the WT Plan is likely to be very small relative to the existing use and anticipated growth driven by demographic factors. At multi-use trailheads, potential effects specifically associated with WT-related NMSB use would be very difficult to distinguish from effects attributable to other use groups.

EDUCATION AND OUTREACH

Because the WT itself does not have any enforcement capability,¹³ the objectives of the WT would be achieved largely through planning, outreach, education, stewardship, and voluntary application of management strategies by land owners and managers. Strategies 17, 18, 19, 20, 21 and 22 identify means for most effectively conducting outreach and education, and promoting stewardship. “Outreach,” as used in this EIR, refers primarily to information publicizing the WT, and WT messages about responsible boating. “Education” is information directed at NMSB users to help them boat more safely and to be more aware of the environmental impacts potentially

¹³ However, some sites would be located on public property controlled by agencies that do have enforcement authority. The U.S. Coast Guard also has enforcement authority over boating.

associated with NMSB use and how to avoid or minimize those potential impacts. The personal and navigational risks, and environmental concerns potentially associated with each project would be identified during the trailhead designation process, and would be used to develop appropriate educational signage. To ensure recognition of the WT, guidelines pertaining to signage, educational materials and content, and similar programs of the WT must be applied consistently at all sites.

Stewardship may be an outgrowth of education and outreach. NMSB clubs and organizations could act as stewards of trailhead facilities by “adopting” a trailhead and helping to manage use of the trailhead. They could also serve as environmental stewards by conducting habitat restoration in and around WT trailheads, participating in monitoring activities, or providing on-water stewards that promote environmentally sound boater behavior. Strategies pertaining to education, outreach, and stewardship would be implemented by the Conservancy or other suitable organization¹⁴ in collaboration with non-motorized small boating organizations, site owners and managers, other agencies, and other interested participants.

TRAILHEAD MAINTENANCE AND OPERATION

The WT Plan recognizes the importance of maintaining trailhead facilities in good condition. Strategies 6, 7, 22, and 24 are designed to ensure that site owners and managers have the necessary resources to effectively maintain trailheads, and to promote a safe, environmentally sound boating experience. They call for development of maintenance and operations plans for trailhead facilities, trailhead stewards, and possible limitations on use to prevent potential unsafe conditions at a site. These four strategies recognize that resources for maintenance may be limited, and recommend that the level of facilities at any specific trailhead be limited to those that the site owner/manager could reasonably maintain. These strategies would be implemented primarily by the site owners and managers, and could also be carried out by stakeholders interested in maintaining high quality trailheads (e.g., NMSB user groups).

OVERALL COORDINATION WITH EXISTING POLICIES, PLANS, PROGRAMS, AND REGULATIONS

To be effective, the WT must integrate smoothly with existing programs, plans, policies, land uses, and regulations in the local area. Strategy 4 is designed to ensure that implementation of the WT would be coordinated with the appropriate programs and requirements. The WT would not change any of these existing programs, plans, policies, land uses, and regulations. It is the landowner’s responsibility to ensure that proposed improvements are consistent with local and regional plans and policies, and applicable regulations. The PMT (see Section 2.4.2) would provide overall coordination to ensure regional support for proposed NMSB access enhancements and/or new access locations.

IMPLEMENTATION OF STRATEGIES

Implementation of the strategies is part of the WT Plan implementation analyzed in this document. Some strategies serve to reduce the potential effects of WT implementation actions and even other strategies. Chapter 3 of this Draft EIR describes how specific strategies may apply to each of the resources discussed, such as whether a strategy is designed to guide specific

¹⁴ As part of the implementation of the WT, the Conservancy may assign certain implementation and management functions to another suitable organization.

components of the WT, or whether it directly addresses potential trailhead impacts. In Chapter 3, resource-protection-oriented strategies are evaluated to assess whether they would adequately address the potential impacts of WT implementation. Suggested changes to the strategies are provided where required to reduce potential impacts to resources.

The strategies are an integral part of the WT Plan and would be applied during overall planning and on a site-specific basis within the regional framework of the Water Trail. During all phases of WT implementation, including the trailhead designation process, potential WT sites will be reviewed to assure compliance with the WT strategies. For example, certain strategies, such as strategies pertaining to the optimum location of access sites, would be implemented during the overall planning phase, when the PMT is making decisions regarding priorities for trailhead designation and working with other agencies to encourage optimal placement of access sites. Other strategies would be applied during the specific trailhead designation process for a certain access site. For example Strategy 9, pertaining to the availability of restrooms, would be applied at this stage. The PMT, working with the site owner/manager would determine during the trailhead designation process whether it is possible for a site that currently lacks restrooms to add those facilities. The Conservancy may also target funding to support implementation of specific strategies. Finally, certain strategies would be applied after a trailhead is designated; examples include strategies calling for monitoring of site use and trailhead stewards.

The Conservancy and PMT have control over the implementation of strategies during the general planning phase and trailhead designation phase; the site owner/manager would be required to implement strategies associated with trailhead construction and operation as a condition of trailhead designation. If a site owner/manager did not carry out agreed-upon strategies, the PMT would work with him or her to try to rectify the problem. A site could lose its WT designation status if problems related to CEQA compliance or other agreed upon measures were ignored or inadequately addressed. The loss of designated status would be a last resort.

The strategies would be applied within existing regulatory frameworks to help develop and manage NMSB access in a manner that is consistent with these laws and regulations as well as with the WT objectives. Organizations responsible for WT implementation would use the strategies as recommendations to guide funding and trailhead designation decisions, and to assess overall priorities for the WT. Resource managers and regulatory agencies would look to the strategies for guidance on policies related to access. Planning agencies would look to the strategies when considering future access opportunities or proposed changes to existing access locations. Other organizations and members of the public would use the strategies as a basis for advocating for or against development and improvement of trailheads (WT roles and responsibilities are described in Section 2.4.2, below).

2.3.4 SITE FACILITY ENHANCEMENTS

One of the main priorities for the WT is improving access to, within, and around the Bay. One of the primary means of improving access is to provide enhanced facilities: either an improvement of an existing facility, or new facilities. The purpose of facility enhancements would be to make a site more useful or safe to existing or future boaters at the site, or to increase the capacity of the site if the lack of certain facilities or features currently restricts site use. Potential facility

enhancements included in a Trailhead Plan could include a wide range of specific components, such as new or improved:

- On-site or directional signage
- Boat launching ramps, boarding floats, or docks (e.g., new ramps, floats, or docks or modifications to existing launch facilities to improve usability, provide safer access, reduce user conflicts, etc.)
- Rigging areas, including rigging areas located closer to the launch site
- Freshwater boat washing facilities
- Boat storage
- Restrooms, including accessible restrooms
- Parking (including increased or more secure parking, and overnight parking; paving unpaved parking areas; parking located closer to rigging and launch areas; fenced or gated parking)
- Site security (e.g., gated access, lighting, emergency telephones, on-site rangers or site managers, or site hosts)
- Picnic facilities (tables, benches, barbecues)
- Recycling and trash receptacles
- Boat rentals
- Instructional facilities
- Overnight accommodations (camping, lodges, hostels, nearby hotels and motels)
- Restaurants and small shops
- Connections to other recreation options (e.g., creation of a link to the Bay Trail), and
- Lawn areas

There are also several types of functional enhancements that would not require physical construction but may make a site more attractive to NMSB users. These include:

- Availability of guided trips
- Educational activities for boaters
- Improved public transportation linkages
- Improved site management (e.g., a reduction in potential conflicts with other recreationists using the site), and
- Availability of other forms of recreation either at the site, or nearby

The need for facility enhancements would be identified during the trailhead designation process, and/or may already be known to the site owner/manager or users. WT staff may recommend that certain enhancements be included in a Trailhead Plan, but the program has no control over other enhancements that site owners may choose to implement at their own initiative. An unknown number of the enhancements potentially identified through the trailhead designation process would be implemented even in the absence of the WT. The trailhead designation process, however, would provide a more planned and coordinated approach for identifying and implementing useful facility improvements at a given site, and provide a regional context regarding facility needs. Facility enhancements could be funded by the site owner, or through other private or public funding sources.

2.3.5 PUBLIC OUTREACH, EDUCATION, AND STEWARDSHIP

A public outreach, education, and stewardship program would be an essential, integrated element of the WT. Outreach, education, and stewardship would provide the means for achieving many of the objectives of the WT. There is some overlap between the three activities. For example, while outreach is primarily focused on publicizing the WT, outreach materials would contain educational information and stewardship messages. Similarly, educational materials may also be used to inform boaters about the WT, and to encourage them to become involved in stewardship activities. Stewardship activities, in turn, present an opportunity for furthering boater education and awareness of the WT. These three activities would help to cultivate the Water Trail ethic, which teaches and promotes safe, low-impact boating practices and encourages trail users to be stewards of the Bay and the Water Trail.

The WT management team, or another designated organization charged with the task of implementing the outreach, education, and stewardship program, would emulate education, outreach, and stewardship programs that have been successfully implemented by other water trails, and would consult with experts in the field to ensure that any programs developed would be effective. The WT would have a coordinated, multi-media effort to provide consistent and accurate information to trail users. No such comprehensive and integrated approach to non-motorized small boating on the Bay currently exists.

PUBLICITY AND PUBLIC OUTREACH

The WT Plan identifies several means by which the public would be made aware of the existence of the WT, including:

- Media, such as the Internet (WT website), brochures, a guidebook, maps, and occasional newspaper or magazine articles
- A logo and signs to be posted at all sites, and
- Interactive dissemination of information at meetings and classes sponsored by boat clubs, businesses, agencies, and a variety of other organizations focused on non-motorized boating on the Bay

Public outreach materials would include educational messages regarding boater safety, environmental protection, stewardship, and other information as appropriate to the medium and site (for site-specific information).

EDUCATION

Education is the most important factor in creating responsible boaters. Responsible boaters would be aware of and comply with safety and navigation requirements, be aware of and respect wildlife and other Bay resources, and use available facilities in a cooperative and respectful manner. Currently, many of the boating clubs and organizations provide some education to their members; however, there is no coordinated effort to ensure that all NMSB users receive a basic level of education, and that the information provided is sufficiently comprehensive. The education program is also the primary basis for defining and promoting the WT ethic. Objectives of an educational program would include:

- Protecting the safety of WT users and others on the Bay

- Teaching trail users how to boat in a manner that is consistent with protecting wildlife and habitat, and
- Fostering stewardship of the WT and of Bay resources.

Consistent safety education messages would be part of the education and outreach programs and would be supplemented at individual sites by site-specific information about nearby boating hazards, no-boating zones, and other pertinent issues. In addition to the means identified for public outreach, above, educational information could also be delivered via:

- On-the-water education, including guided tours and outings as well as individual boater-to-boater information sharing (see Stewardship, below, for a broader discussion), and
- Posting of pertinent information at boater decision points, as feasible and appropriate

Most key decision points for paddleboaters and board sailors occur on the water. While it is infeasible to install on-the-water signs in most areas of the Bay, indicator buoys or other types of signage may be a viable option for the WT in some locations.

Personal boating and navigational safety, protection of wildlife and sensitive habitat, and stewardship of Bay resources are issue areas that would need to be addressed in the educational program, including the information signs to be incorporated into sites that become designated WT trailheads. The exact language of the signs would differ from site to site, but the messages would be consistent and would include all major topics in proportion to the needs of individual sites. WT signs would conform to the BCDC sign design guidelines and other applicable local and regional sign standards (e.g., NPS signage guidelines for sites located on NPS property and traffic signage standards for signs located along public roads) as required.

To meet the need for both system-wide and site-specific education for boaters, significant gaps in existing education efforts would be identified through interviews with clubs, businesses, associations, and related groups that currently offer some aspect of education about boating on the Bay. Recommendations for expansion, modification, coordination or other changes to what is currently offered would be included in a report based on these interviews and exploration of programs developed by other water trails. The results would be synthesized and presented to the WT managers and stakeholders for their review and comments before the education and outreach program is finalized. This review and synthesis would take place before designation of trailheads begins.

STEWARDSHIP

Stewardship efforts would build on the educational programs of the WT, to encourage NMSB users to physically “care for” or “take care of” Bay resources and access sites themselves. Fostering stewardship of the resources of the Bay would be consistent with other water trail programs (e.g., Washington Water Trail Association and the Maine Island Trail Association) that motivate boaters to participate in responsible management and protection of resources. Stewardship programs would include boater-to-boater education, which may be carried out by docents on the water or at launch sites, and by the organization or sponsorship of special events, classes or tours.

Additionally, stewardship programs could include volunteers “adopting” a trailhead, and helping to maintain (e.g., by participating in site clean-ups) and improve trail facilities (e.g., by improving a path to a launch or planting vegetation). This type of volunteer-based site stewardship would help build a constituency of trail users that cares about and has a sense of responsibility for the condition of the trailhead. In some cases, a constituency that cares about (and for) a trailhead may already exist (e.g., a boating club or group that launches regularly from a specific site, as is the case at Islais Creek in San Francisco). Rather than implement a *de novo* stewardship effort for these sites, the WT could partner with these individuals or organizations to support and promote their ongoing stewardship efforts.

Stewardship of the Bay’s natural resources could also involve active participation in habitat clean-ups or restoration events. This type of stewardship effort would probably not be a formal component of the Water Trail stewardship program, but site restoration is a complementary stewardship activity that falls within the enabling legislation of the Conservancy for the San Francisco Bay region and thus may be fundable by the Conservancy.

2.3.6 OTHER WT PLAN CONSIDERATIONS

As stated earlier, other WT Plan goals include implementing the Plan consistent with respecting private property, and avoiding impacts on agricultural operations. All site owners would have the choice of whether or not to request trailhead designation. Trailhead and/or Signage Plans would ensure that privately-owned sites would be clearly identified as such. WT outreach and publicity materials would also reflect each site’s specific conditions of use. Other private lands adjacent to and near trailhead locations would be protected by local laws and regulations. WT Strategy 4 specifically calls for consistency with existing policies, plans, and procedures, and defines how trailhead designation and other WT activities would consider potential impacts to nearby lands. Most agricultural operations also occur on private lands, and as such are protected by trespassing and other property protection laws.

2.4 Water Trail Plan Implementation

This section describes the expected approach to how the WT Plan would be implemented. The implementation process may be refined in the future if, for example, modifications would streamline the implementation process and/or make it easier to achieve the goals of the WT. Implementation of the WT Plan, including trailhead designation, is dependent on availability of funding. Unless sufficient funding is available to carry out the strategies and mitigation measures described in the WT Plan and in this EIR, the WT Plan cannot be implemented.

2.4.1 WATER TRAIL PLAN IMPLEMENTATION OVERVIEW

Implementation of the WT Plan is expected to consist of five primary tasks that are likely to overlap:

- Designation of Trailheads
- Development of WT signage
- Funding of select WT-related facility improvements
- Coordination of education, outreach, and stewardship programs for NMSB users, and
- Development and distribution of WT information

These activities would be implemented by a wide range of stakeholders. The stakeholders and their primary roles and responsibilities are described in detail below, followed by a description of the tasks required to implement the WT.

2.4.2 WATER TRAIL IMPLEMENTATION ROLES AND RESPONSIBILITIES

Implementation of the WT is designed to be a highly collaborative effort. The WT would have numerous stakeholders who would have key roles in implementation of the WT. Many of these stakeholders are presently conducting the same types of activities as they would for WT implementation and have partially or substantially overlapping responsibilities. During implementation of the WT, there would continue to be some overlap in responsibilities; however, the WT Plan provides added organization and clarity. The main stakeholder groups and organizations would be:

- Site Owners
- Site Managers
- Local, Regional, State, and Federal Government Agencies
- Regulatory and Permitting Agencies
- Wildlife Protection and Resource Management Agencies
- Grant-making (Funding) Agencies
- Navigation Interests
- NMSB Users
- Other Recreationists
- NMSB Participant Organizations/Boat Clubs
- Non-Governmental Environmental and Wildlife Protection Organizations
- Private Citizens
- Waterfront and Water-oriented Businesses
- Experts and Scientific Researchers
- Project Management Team, composed of:
 - California State Coastal Conservancy
 - Bay Conservation and Development Commission
 - California Department of Boating and Waterways
 - Association of Bay Area Governments (ABAG)
- Advisory Committee

The expected roles and responsibilities of the various stakeholder groups are described below, and summarized in Table 2.4.2-1.

SITE OWNERS AND SITE MANAGERS

There are more than 50 local, regional, state, and federal government jurisdictions along the margins of the Bay that may have WT trailheads. In addition to these government jurisdictions, WT trailheads may also be located on private property. The 112 proposed WT Backbone Sites are managed by over 50 site owners/managers who currently manage, maintain and improve these sites consistent with their personal or their organization's missions and available funding. Site owners would continue their current responsibilities once the WT is implemented. In

TABLE 2.4.1-1 WATER TRAIL IMPLEMENTATION ROLES AND RESPONSIBILITIES		
Stakeholder Category	Stakeholders Included in Category	Responsibilities
Site Owners/ Managers	<ul style="list-style-type: none"> • Cities • Counties • Parks and Open Space Districts • California Department of Parks and Recreation (State Parks) • Port Authorities • DFG • NPS • USFWS • Marinas (public and private) • Private individuals and businesses with docks available for public use 	<ul style="list-style-type: none"> • Maintain and manage existing sites • Participate in trailhead designation process, including development of Site Description and/or Trailhead Plan and PMT/Advisory Committee meetings (as Stakeholder) • Identify needed facility improvements • Identify potential new sites • Apply for funding • Implement CEQA and other regulations pertaining to site facility improvements and new site development, as required • Implement WT Strategies and mitigation measures applicable to site owners • Enforce compliance with applicable rules and regulations at the trailhead • Work with other stakeholders such as boat rental companies, boat clubs
Local, Regional, State, and Federal Public Agencies	<ul style="list-style-type: none"> • Local: cities, parks and open space districts, port authorities • Regional: counties, districts, ABAG, BCDC, RWQCB • State: DFG, Conservancy, State Land Commission, State Parks • Federal: USCG, USFWS, National Oceanographic and Atmospheric Administration (NOAA)-Fisheries, NPS, Corps of Engineers, California Coastal Commission 	<ul style="list-style-type: none"> • Incorporate goals of the WT into planning efforts (e.g. General Plan updates) and land use decisions • Provide funding for continued maintenance and operation of existing sites, including adequate funding and personnel to ensure safety and necessary enforcement activities • Fund improvements of existing sites and creation of new sites
Regulatory and Permitting Agencies	<ul style="list-style-type: none"> • USCG • BCDC • RWQCB • DFG • Corps of Engineers • USFWS • NOAA Fisheries • Cities • Counties 	<ul style="list-style-type: none"> • Review/approve permit applications related to site improvements • Provide information on safety and health hazards as needed (USCG, RWQCB) • Enforce compliance with regulations and permit conditions • Cities and counties may serve as CEQA lead agency for improvements at private sites, as needed
Wildlife Protection and Resource Management Agencies	<ul style="list-style-type: none"> • DFG • USFWS • NOAA Fisheries • Resource Conservation Districts • RWQCB • Bay-Delta Program Authority 	<ul style="list-style-type: none"> • Provide guidance on management and implementation practices to minimize adverse impacts to wildlife and natural resources from WT implementation and NMSB use in the Bay • Provide guidance on and/or require seasonal closures and other protective measures, as needed, to protect sensitive species

TABLE 2.4.1-1 WATER TRAIL IMPLEMENTATION ROLES AND RESPONSIBILITIES		
Stakeholder Category	Stakeholders Included in Category	Responsibilities
Grant-making (Funding) Agencies	<ul style="list-style-type: none"> • Conservancy • Cal Boating • Non-Profit Organizations 	<ul style="list-style-type: none"> • Identify funding priorities • Review and approve applications for funding consistent with availability of funding and priorities for funding • Make existence of funding availability known to appropriate potential recipients • Fund enhancements of existing sites and creation of new sites • Fund education, outreach, and stewardship programs
Navigation Interests	<ul style="list-style-type: none"> • San Francisco Bay Region Harbor Safety Committee • Large vessel operators (including container shipping lines, cruise lines, tankers, oil barges, dredgers, tugs, and commercial fishers) • Ferry operators and ferry system administrators and managers (including the Water Emergency Transportation Authority) • Commercial recreational boating enterprises (e.g., deep sea fishing, whale watching, and Bay cruises) • Harbor Masters and Port Captains • Motorized recreational boat users • Large sailboat users 	<ul style="list-style-type: none"> • Provide expertise regarding navigation concerns
NMSB Users (Individuals)	<ul style="list-style-type: none"> • Any participant in NMSB activities 	<ul style="list-style-type: none"> • Advise on trailhead design to best serve different NMSB users' needs • Identify user safety issues during trailhead design • Provide advice on development of education, outreach, and stewardship programs • Lead or participate in boater education programs (safety and environmental protection) • Participate in stewardship programs (trailhead stewardship, environmental stewardship) and WT events
Other Recreationists	<ul style="list-style-type: none"> • Birders • Hikers • Campers • Hunters • Anglers 	<ul style="list-style-type: none"> • Participate in stewardship programs (trailhead stewardship, environmental stewardship) at multi-use trailheads • Identify site-specific issues and assist in trailhead design during the trailhead designation process
NMSB Participant Organizations/Boat Clubs	Includes all organizations/clubs dedicated to promoting any NMSB activity, and/or supporting NMSB users. Also includes teams. A detailed list of these organization is provided in Section 3.3.	<ul style="list-style-type: none"> • Advise on trailhead design to best serve different NMSB users' needs • Identify user safety issues during trailhead design • Provide advice on development of education, outreach, and stewardship programs • Conduct boater education programs (safety and

TABLE 2.4.1-1 WATER TRAIL IMPLEMENTATION ROLES AND RESPONSIBILITIES		
Stakeholder Category	Stakeholders Included in Category	Responsibilities
		<ul style="list-style-type: none"> environmental protection) • Develop and implement stewardship programs (trailhead stewardship, environmental stewardship)
Non-Governmental Environmental and Wildlife Protection Organizations	Includes all organizations dedicated to the protection of specific species, endangered species, habitat conservation, water quality protection, and more. May also include organizations with multiple environmental protection objectives (e.g., the Sierra Club).	<ul style="list-style-type: none"> • Develop and implement environmental education and stewardship programs • Identify concerns/issues for wildlife and natural resources • Advise PMT on implementation practices to minimize adverse impacts on wildlife and natural resources.
Private Citizens	<ul style="list-style-type: none"> • Nearby residents • Other interested citizens who do not participate in NMSB activities 	<ul style="list-style-type: none"> • Share concerns or ideas relevant to specific implementation issues
Waterfront and Water-oriented Businesses	<ul style="list-style-type: none"> • Private marina owners/operators • Tour operators • Restaurant owners • Boat sellers • Boating instruction, storage, and rental providers • Other concessionaires 	<ul style="list-style-type: none"> • Provide the perspective and represent the interests of businesses directly or indirectly associated with NMSB use
Experts and Scientific Researchers	<ul style="list-style-type: none"> • Experts in environmental and wildlife protection • NMSB experts • Researchers conducting studies pertaining to environmental and wildlife protection, recreation, and recreation/wildlife interaction • Design and accessibility experts • Education and public outreach experts 	<ul style="list-style-type: none"> • Provide expert opinion when requested by Advisory Committee or PMT • Conduct monitoring when requested by site owners (as feasible based on funding)
Project Management Team	<ul style="list-style-type: none"> • ABAG • BCDC • Cal Boating • Conservancy 	<ul style="list-style-type: none"> • Develop trail projects with site owners/managers • Develop recommendations on trail design and management • Designate or undesignate trailheads • Determine and prioritize project and program objectives • Implement applicable WT Plan Strategies
Advisory Committee	The Advisory Committee to the PMT will be comprised of selected representatives from 13 different interest areas. ¹⁵	<ul style="list-style-type: none"> • Advise the PMT on trailhead designation and other implementation issues

¹⁵ Other individuals from those same interest areas may participate in PMT/Advisory Committee meetings as stakeholders.

TABLE 2.4.1-1 WATER TRAIL IMPLEMENTATION ROLES AND RESPONSIBILITIES		
Stakeholder Category	Stakeholders Included in Category	Responsibilities
State Coastal Conservancy ¹⁶	N/A	<ul style="list-style-type: none"> • Conduct CEQA review for WT Plan • Revise and approve WT Plan • Provide WT staff • Develop WT signage program elements with PMT/Advisory Committee • Lead Project Management Team and Trailhead Designation process • Oversee development and implementation of educational program(s) • Oversee development and implementation of WT outreach/publicity materials and publicity/public outreach, including development of logo • Provide funding for select WT site improvements, as available • Maintain on-going relationships with other WT projects around the country to provide for continuous improvement of the San Francisco Bay Area WT • Develop or oversee development of prototype stewardship programs • Advocate for inclusion of WT goals in local and regional planning and funding decisions • Manage/track compliance of WT with WT Plan Strategies • Manage CEQA Mitigation Monitoring and Reporting program for WT Plan • Stay informed about pertinent new scientific information regarding environmental resources potentially impacted by the WT, and work with site owners/managers as needed to respond to this new information
San Francisco Bay Conservation and Development Commission	N/A	<ul style="list-style-type: none"> • Develop Draft WT Plan (completed 2007) • Participate in Project Management Team • Participate in Trailhead Designation process • Advocate for inclusion of WT goals in local and regional planning and funding decisions • Promote WT goals through permit decisions
California Department of Boating and Waterways	N/A	<ul style="list-style-type: none"> • Participate in Project Management Team • Participate in Trailhead Designation process • Develop education materials specific to non-motorized small boaters • Develop design guidelines for boat launching ramps, boarding floats, and other launching facilities that comply with the pending ADA-ABA Accessible Guidelines • Provide funding for select WT site improvement

¹⁶ The Conservancy may designate another appropriate entity to carry out some of these responsibilities.

TABLE 2.4.1-1 WATER TRAIL IMPLEMENTATION ROLES AND RESPONSIBILITIES		
Stakeholder Category	Stakeholders Included in Category	Responsibilities
		<ul style="list-style-type: none"> • Provide coordination between motorized and non-motorized small boating communities
Association of Bay Area Governments	N/A	<ul style="list-style-type: none"> • Participate in Project Management Team • Participate in Trailhead Designation process • Coordinate WT Trailhead designation and development with Bay Trail planning and development

addition, they would participate in trailhead designation, implement CEQA¹⁷ for any WT-related improvements (as needed), and apply for funding for enhancements, as appropriate. Some site owners may have multiple management roles. For example, the California Department of Fish and Game (DFG) is a site owner, is responsible for wildlife and native plant protection in California, manages hunting on its lands, and also regulates certain construction activities near creeks and other waterways.

LOCAL, REGIONAL, STATE, AND FEDERAL PUBLIC AGENCIES

Local, regional, state, and federal public agencies carry out multiple functions with respect to NMSB use. They may plan for and provide access, regulate access and boater behavior, provide funding for facility improvements, enforce laws, and issue permits. These agencies would continue in their existing roles when the WT is implemented. Four agencies, including the Conservancy, BCDC, Cal Boating and ABAG would have increased responsibilities once the WT is implemented (see description of Project Management Team, below).

REGULATORY AND PERMITTING AGENCIES

Regulatory and permitting agencies are responsible for ensuring that activities conducted in and around the Bay conform to existing environmental requirements. Certain types of construction activities and facility operations are currently subject to permitting or regulations, and would continue to be subject to the same permit and regulatory requirements. For example, stormwater management is under the purview of the San Francisco Bay Regional Water Quality Control Board (RWQCB), and BCDC regulates development within its jurisdiction. The USCG regulates navigation and enforces navigation rules on the Bay. The roles and responsibilities of these agencies would not change due to implementation of the WT.

WILDLIFE PROTECTION AND RESOURCE MANAGEMENT AGENCIES

Wildlife protection and resource management agencies are responsible for providing stewardship of the Bay's natural resources. These agencies may have permitting or other regulatory powers to limit development and construction activities, or modify proposed development and construction activities to reduce potential impacts to habitat and/or sensitive species. In addition, these agencies may conduct or require monitoring of potential impacts to habitats or specific species, and develop plans to promote recovery of endangered and threatened species. Wildlife protection

¹⁷ Private owners would provide information and documentation to a CEQA lead agency as needed.

and resource management agencies would continue to serve in their current roles once the WT is implemented.

GRANT-MAKING (FUNDING) AGENCIES AND ORGANIZATIONS

While implementation of the WT Plan is intended to facilitate the authorization of funding for select facility enhancements that would further the goals of the WT, there is no designated, guaranteed source of funding for facility enhancements or any other WT activity. Various grant-making agencies, including the Conservancy and Cal Boating, and various non-profit organizations, may currently make grants for facility enhancements that promote NMSB access to the Bay. These grant-making activities would continue and possibly increase with implementation of the WT.

NAVIGATION INTERESTS

Non-motorized small boating comprises only a portion of the highly varied boat traffic on San Francisco Bay. Other navigation interests run the gamut from agencies that regulate navigation (USCG, Cal Boating) to owners of motorized vessels of all types, and owners of large sailboats. This category also includes Ports. The roles and responsibilities of this category of stakeholders would remain the same with implementation of the WT.

NMSB USERS

This category of stakeholders consists of all participants in NMSB activities. A portion of this group belongs to NMSB clubs or other NMSB organizations. This group also includes casual participants (e.g., individuals who may periodically rent a kayak or other NMSB from a local outfitter). The WT is designed to help this group of stakeholders become more informed, safe, and environmentally sensitive boaters. With implementation of the WT, these users would have enhanced access, more information regarding various access sites, greater access to education, and potentially greater opportunities for stewardship.

OTHER RECREATIONISTS

Most trailheads would be used by multiple user groups, including motorized boat users. Parks, wildlife areas, and open spaces may be used by anglers, hikers, bicyclists, campers, and hunters. On the water, NMSB users may again encounter motorized boat users, including anglers, hunters, water skiers, personal water craft riders, and other motorized boat users. Other recreationists would be interested in ensuring that their priorities are also considered when a public agency expends funds to promote recreational access to the Bay. The roles and responsibilities of other recreationists would remain the same with implementation of the WT.

NMSB PARTICIPANT ORGANIZATIONS/BOAT CLUBS

There are numerous organizations supporting and advocating for NMSB use. These organizations have different goals and objectives. They may disseminate information regarding opportunities for participation in specific NMSB sports; provide boating instruction, and safety and environmental education and training; advocate for improved facilities for specific sports; and serve as forums for existing non-motorized small boating participants. These organizations would continue to serve in their existing roles. Depending on their capabilities and desire to take on additional responsibilities, some of these organizations may provide more formalized environmental education, and environmental and trailhead stewardship.

NON-GOVERNMENTAL ENVIRONMENTAL AND WILDLIFE PROTECTION ORGANIZATIONS

Non-profit environmental and wildlife protection organizations work with local, state and federal agencies to promote protection of specific types of species and/or to support restoration, purchase, and creation of critical habitat. Many of these organizations also raise money to support sensitive species protection and conduct public outreach and education regarding their work. Some of these organizations conduct wildlife research and surveys. During implementation of the WT, non-governmental environmental and wildlife protection organizations would continue to serve as an educational resource and as advocates for sensitive species and habitat protection.

PRIVATE CITIZENS

Trailheads will be located in many different locations, and may affect Bay Area residents that do not participate in NMSB activities. For example, nearby residents may be concerned about the number of NMSB users using a specific trailhead.

WATERFRONT AND WATER-ORIENTED BUSINESSES

Some sites are owned by private businesses, such as private marinas and restaurants. These private site owners may elect to have their sites designated as WT trailheads (see discussion of site owners). Other businesses that would provide services to potential WT users include rental equipment providers, instructional facilities, boat sellers, boat storage providers, restaurants or hotels/hostels/campgrounds and other concessionaires at or near a trailhead. Waterfront and water-oriented businesses would continue to serve in their current roles once the WT is implemented.

EXPERTS AND SCIENTIFIC RESEARCHERS

Various local environmental experts and scientific researchers continue to study the Bay and its resources, as well as impacts of recreational activities on the Bay. Trailhead Plans and designation decisions may at times require input from experts. Researchers may be called upon to help develop monitoring programs, site-specific mitigation, or avoidance measures. The WT may also draw on experts in the fields of recreation and accessible design to assist site owner/managers with creating facility improvements that comply with the pending ADA-ABA Accessible Guidelines. Public outreach and community education experts could provide valuable input into the educational and public outreach programs to be developed by the WT, and could provide guidance on how the WT could most effectively coordinate existing outreach and education efforts.

PROJECT MANAGEMENT TEAM

The PMT would have the primary responsibility for implementing the WT Plan. It would consist of representatives from the Conservancy, BCDC, Cal Boating, and ABAG. The PMT would engage and consider all relevant major interests in decision-making and would seek input from the relevant interests among the Advisory Committee and Stakeholder Group (see below) as needed to address issues that arise. The PMT would meet with the Advisory Committee on a regular basis, and solicit Advisory Committee input on trailhead designation and other WT issues. The PMT and/or Advisory Committee would also identify instances in which additional input and expertise are needed. Detailed information regarding the roles and responsibilities of the four agencies comprising the PMT is provided in Table 2.4.2-1.

ADVISORY COMMITTEE

The Advisory Committee would be a stable group of representatives of major trail interests who meet regularly with the PMT and are available individually for consultation on a consistent basis. The Advisory Committee would not include all interests and expertise that may be needed for any and every trail issue or project. The PMT and/or Advisory Committee would identify instances in which additional input and expertise may be needed. The WT Plan recommends the following members for the Advisory Committee:

- Accessibility expert
- Bay Access, Inc.
- California Association of Harbor Masters and Port Captains
- DFG
- State Parks
- County or local parks
- East Bay Regional Parks District
- Hospitality industry
- Outfitter/tour guide
- NPS
- Save the Bay
- USCG
- USFWS
- Wildlife and habitat protection organization

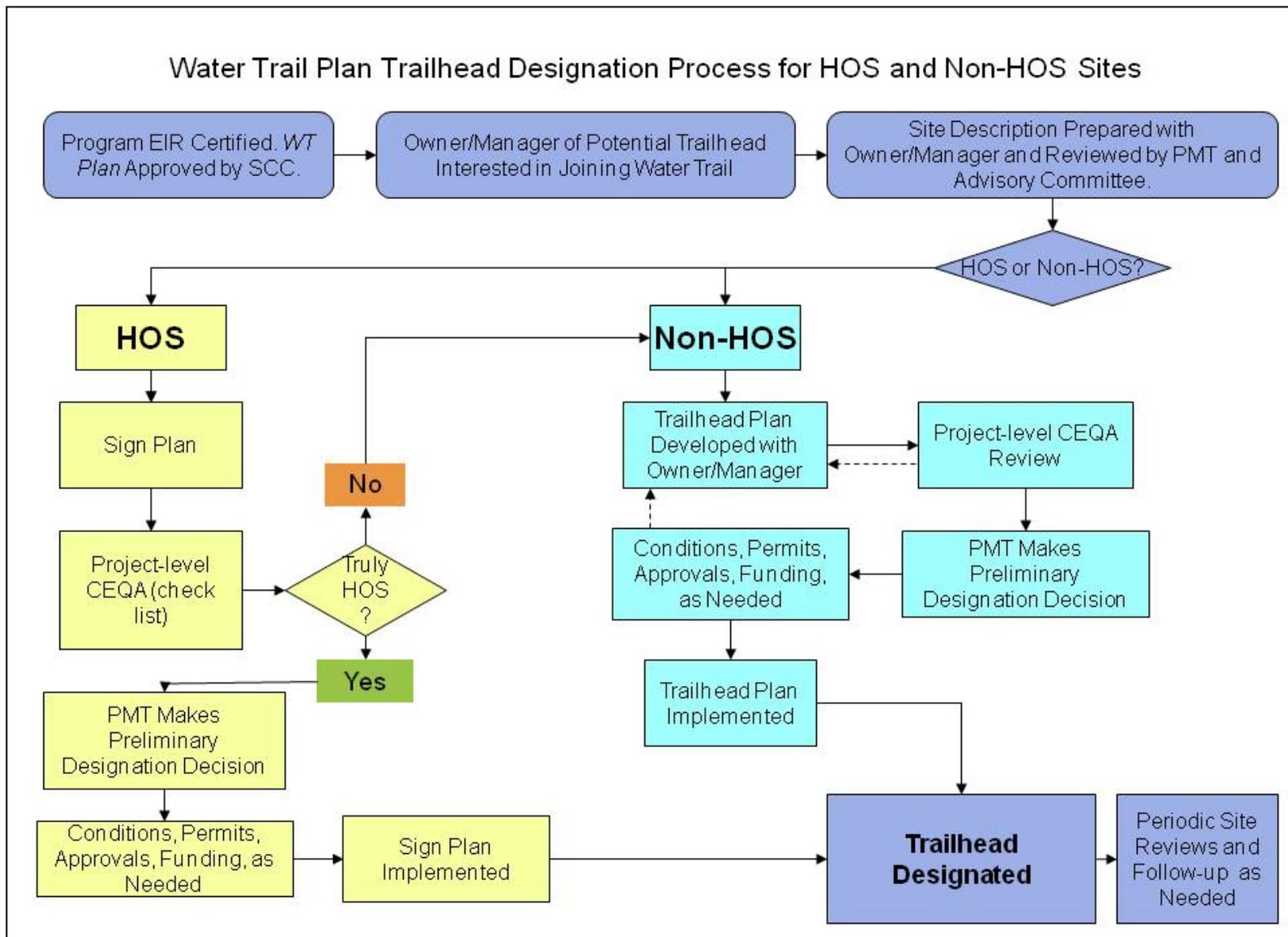
The PMT would request participation on the Advisory Committee by specific organizations or representatives of these interests, and/or other interests, as appropriate.

STAKEHOLDER GROUP

Stakeholders are all interested agencies, organizations, and individuals who would like to participate, at their discretion, in WT meetings and provide input to the PMT and Advisory Committee. The members of the Stakeholder Group would participate when there is an issue or project of interest to them, or if the Advisory Committee or PMT specifically asks for their input and involvement.

2.4.3 TRAILHEAD DESIGNATION PROCESS

Trailhead designation would begin after finalization and certification of this EIR. Trailhead owners/managers would join the WT network on a voluntary basis. The trailhead designation process is expected to be similar for all sites; however, the process would be more streamlined for High Opportunity Sites. This is because, by definition, HOSs are sites where the only physical construction required to meet the trailhead designation criteria is the addition of signage. The evaluation conducted during the initial steps of the designation process would confirm that a site currently classified as an HOS meets the HOS criteria. The initial evaluation may also identify sites that are not currently classified as HOSs that do meet the criteria of a High Opportunity Site. The steps in the trailhead designation process are illustrated in Figure 2.4.3-1. The first three steps would be the same for all sites.



Note: HOS = High Opportunity Site. See Section 2.4.2 for detailed description of designation roles and responsibilities.

Figure 2.4.3-1: Trailhead Designation Flowchart

In the case of HOSs, a Sign Plan would be developed rather than a full Trailhead Plan. An environmental effects checklist customized for the Water Trail would be used to assure WT staff that designation of the site and placement of signage would not cause potential significant effects. (A preliminary draft of this customized checklist is included in Appendix E.) This step would be necessary because conditions at HOSs could have changed since Backbone Sites were evaluated during the Water Trail planning process (2005-2007). If such effects were found, the potential trailhead would be reclassified from an HOS to a non-HOS and would be evaluated as a non-HOS. For sites remaining in HOS status, any approvals, permits, or other required authorizations would be obtained by the site owner/manager, the Sign Plan would be implemented, and the site would be officially designated by the PMT as a Water Trail trailhead.

In the case of non-HOSs, site descriptions would be developed into much more detailed Trailhead Plans (including planning for signs/educational materials) with site-specific CEQA reviews. As explained in more detail below, this Program EIR is expected to cover much, if not all, of the environmental review needed for many of the Backbone Sites (HOSs in particular), and some sites have already been evaluated under CEQA (and NEPA) by site owners/managers and may not need any further analysis. Nonetheless, in all cases, the Trailhead Plans for all non-HOSs would be reviewed by the PMT with the Advisory Committee and other experts as needed to determine the adequacy of the CEQA analysis as it relates to the site becoming part of the WT. The site owner/manager, if a public entity, or, if not, another public entity issuing a permit, funding or otherwise taking discretionary action with respect to the site, would be the lead for any additional CEQA analysis needed beyond this Program EIR, and that analysis could lead to modification of the Trailhead Plan and/or modification of conditions needing to be met before trailhead designation could take place.

The trailhead designation process would be managed by the PMT, with assistance from the Advisory Committee, site owners/managers, and members of the Stakeholder Group, as appropriate. PMT meetings would be open to the public.

INITIATING THE TRAILHEAD DESIGNATION PROCESS

The PMT would notify potential trailhead site owners/managers about finalization of this EIR and approval of the WT Plan, and inquire whether they would be interested in having their site designated as a WT trailhead. Some site owners/managers may approach the WT about designation of their sites. It is anticipated that the PMT would initially prioritize its review of the potential trailhead sites based both on the level of review required (e.g., HOSs first) and how well the site would fulfill the goals of WT Strategies 1 and 2 pertaining to trailhead location.

DEVELOPMENT OF THE SITE DESCRIPTION

Once a site owner expresses interest in having a launch or destination site designated as part of the WT, WT staff and the site owner/manager would prepare a Site Description. The Site Description would provide enough information for the PMT and Advisory Committee to understand the existing and planned features of the site, and any trail-related issues. The Site Description would also address the topics shown in Table 2.4.3-1 (as they apply to a specific site). The Site Description would include completion of an environmental effects checklist (see preliminary draft in Appendix E) to evaluate whether the site meets HOS criteria (see discussion of CEQA review during the trailhead designation process, below). After a site has been

TABLE 2.4.3-1 SITE DESCRIPTION COMPONENTS

Information Category	Types of Information Provided in Site Description
General site information	Location, ownership and manager
Maps, site pictures, plans and/or drawings (if applicable)	Existing site facilities and features Habitat areas Location of various uses on the site Proximity to other launch and destination sites
Manager's/owner's goals for the site	Site master plans, use plans, general plan policies, and zoning
Use of the site	Boating and non-boating uses
Description of existing or planned facilities, and compliance with pending ADA-ABA Accessible Guidelines	Launch (type[s] of launch[es] or landing[s]) Current and expected user groups and usage Parking (amount available for trail-related use, restrictions, fees, drop-off spots, distance to launch) Restrooms (number, type) Other boating-related facilities (such as staging areas, boat storage, or wash stations) Overnight accommodations Signage
Education, outreach and stewardship	Description of existing and planned programs
Description of existing and planned site management	Maintenance staffing levels Maintenance provided Level of management (e.g., pick up trash only, or active enforcement of user behavior)
Physical access considerations	Nearby good boating areas User conflicts Availability of public transportation; Security concerns/vandalism
Wildlife and habitat considerations	Nearby harbor seal haulout or other sensitive wildlife or habitat area Wildlife viewing or interpretive opportunities
Safety considerations	Strong currents nearby Adjacent to a safety exclusion zone Water quality concerns Navigational risks
Other existing and/or anticipated WT-related issues and opportunities	

designated, WT staff would use the site description information as the basis for additions to education and outreach materials. WT staff would present the Site Description at the PMT/Advisory Committee meeting. Development of the Site Description would include verification of site conditions, including the presence or absence of sensitive resources in the vicinity of the site. This step is crucial to ensure that a site is correctly classified as a HOS or non-HOS, because the location of sensitive resources may change over time. Verification would likely be accomplished using existing information, such as a review of current literature, communication with regional resource agency personnel, photo review and/or site visits.

DEVELOPMENT OF A SIGN PLAN (HOSS)

For sites meeting the HOS criteria, a Sign Plan will be developed to accompany the Site Description. Signage is the only added requirement for designation of a HOS as a WT trailhead, and would be developed in accordance with the WT signage program (see Section 2.4.4). Signage would convey safety and environmental information, as well as general information about the WT, and would be developed to complement existing signage at the trailhead. Directional signage would also be developed, and installed as appropriate.

Signage may require a BCDC permit. Certain site owners have existing signage permits applicable to all their properties; however, most would be required to apply for an amendment to an existing permit, or an administrative permit if there is no existing permit that addresses signage. Even if there is an existing permit, review of the sign plans would still be required by BCDC. All WT signs would conform to BCDC signage guidelines as required. Sign Plans for non-HOSs would be developed as part of the Trailhead Plan. The information that must be included on signage for non-HOSs would be defined in part through the development of the Trailhead Plan and associated CEQA review.

ADVISORY COMMITTEE REVIEW

The Advisory Committee would provide input on the Site Descriptions, Sign Plans, and Trailhead Plans. In its review of a non-HOS, the Advisory Committee would make suggestions to the PMT on trailhead design, development and management, and could identify additional stakeholders and experts to consult. Recommendations would focus on how the WT strategies could be most effectively applied to the proposed trailhead. The Advisory Committee's review would also include an evaluation of whether the Sign Plan conforms to the WT guidelines.

The Advisory Committee would not be approving or denying sites for inclusion into the WT, but the recommendations from the Advisory Committee would be seriously considered by the PMT. All of the meetings at which decisions will be made about trailhead designation would be open to the public.

EXPANSION OF THE SITE DESCRIPTION INTO A TRAILHEAD PLAN

For all Backbone Sites (and any sites potentially designated in the future) that do not meet the criteria of an HOS, the Site Description would be expanded into a "Trailhead Plan," which would include an appropriate Sign Plan. WT staff would work with the site manager to develop the Trailhead Plan, which would address a range of issues related to site improvements, management, maintenance, education, outreach, stewardship, and any other issues that pertain to that site, including issues identified by the PMT, Advisory Committee, other experts, and stakeholders. The Trailhead Plan would also describe how its proposed components would support the vision and goals of the WT Plan. As described earlier, potential WT sites will be reviewed to assure compliance with the WT strategies. The Trailhead Plan would focus only on the uses and features of the site that are or could be used by NMSB users. Additionally, the plan would identify who would be responsible or take the lead for implementing the proposed components. It would also include an operations and maintenance plan to ensure that adequate resources are available to manage and maintain the trailhead and any new or improved facilities. The Trailhead Plan would include a budget describing funding that the site manager has for the site or is seeking for the trailhead development, if any.

Consideration of the WT strategies would form an integral part of developing the Trailhead Plan. For example, the strategies would provide guidance on the types of facilities that may be desirable at trailheads or the types of wildlife and habitat protection measures that should be put in place at given sites. The Trailhead Plan would then apply that guidance in a practical, explicit way, as appropriate to the individual site and/or as directed by a mitigation measure integrated into the implementation of the Water Trail Plan through this EIR or through other CEQA review. As another example, the strategies would help shape the types of educational information or stewardship practices that would be provided at a site, as well as the means by which that information would be provided. The Trailhead Plan is designed to apply the guidance provided in the strategies and WT Plan in general in specific ways, appropriate to the specific site.

CEQA AND NEPA REVIEW DURING THE TRAILHEAD DESIGNATION PROCESS

HOSs were identified based on available information at the time the WT Plan was developed. More detailed review of site-specific conditions and/or changes in site-specific conditions may lead to the conclusion that a site previously designated as an HOS no longer meets the HOS criteria. Similarly, closer review of a proposed WT site that was initially classified as not meeting HOS criteria may be determined to meet HOS criteria. WT staff would prepare an environmental effects checklist (Preliminary Environmental Effects Checklist for Trailhead Designation Process or “Checklist”) to identify site characteristics, to specify the potential impacts associated with the designation of the site, and to identify the mitigation measures needed, if any, under the EIR to avoid or reduce any effects to a less-than-significant level. The Checklist and the description of the site would be used to assess whether a site meets the HOS criteria. The Checklist would then be used to determine whether the designation of the site will require additional environmental documentation either because the environmental effects associated with the site designation or the measures needed to avoid or reduce that effect were not fully considered by the EIR.

The Checklist would be tailor-made for this EIR and the WT project and would include the potential environmental effects of site designation that have been assessed under this EIR and the associated mitigation measure proposed by the EIR to avoid or reduce the specific potential effects. For any potential effect associated with the site designation, the respective mitigation measures required by the EIR for that effect would be included within the Trailhead Plan. While this EIR in combination with the Checklist may be all that is needed to demonstrate CEQA compliance for trailhead designation for HOSs (i.e., where no potentially significant impacts are identified), designation of other Backbone Sites (or future sites) would likely require additional CEQA documentation beyond the review provided under this EIR. A preliminary draft of the Checklist is provided in Appendix E.

CEQA review for trailhead designation does not replace the site-specific CEQA review required if new facilities will be constructed. For such sites, if the site owner/manager is a public entity, it would be the CEQA lead for site-specific environmental compliance. If the site owner/manager is a private person or entity, then the lead agency would be the agency that is permitting, funding or taking any other discretionary action regarding the site. Some sites (such as HOSs, which only require signage) may require CEQA review only to address the trailhead designation process.

After this Draft Programmatic EIR is finalized and certified, the CEQA lead agency may tier site-specific projects off of it. Additional environmental review would be limited to any new “effects” that were not covered in the Final Programmatic EIR, any new mitigation measures beyond those required by this EIR for those effects or any effect that is more severe than anticipated and assessed in this EIR. The lead agency may use the proposed Checklist to make these determinations.

Some sites may have existing CEQA documentation that addresses the actions required for trailhead designation. To the extent that additional CEQA documentation is required for designation of the site (i.e. if the site has different effects, more severe effects, or requires mitigation not fully addressed in this EIR), a public agency in the designation process may utilize that existing CEQA documentation in order to meet the requirements of CEQA for the designation. Determination of whether this EIR and the existing CEQA documentation collectively satisfy the requirements of CEQA for purposes of designation would be made by involved public agencies on a site-specific basis during the trailhead designation process.

For potential WT sites located on federal lands or managed by a federal agency, the federal agency would be required to comply with NEPA with respect to the designation or improvement of a WT site. The Final Programmatic EIR for the WT may be used by the federal agency as a source document in undertaking environmental assessment or more detailed review under NEPA of the proposed designation or other activity related to the WT site.

PROJECT MANAGEMENT TEAM REVIEW AND DECISION

The PMT would review the Site Descriptions, and Sign Plans and/or Trailhead Plans (as applicable to the various sites), and make the final decisions regarding designation of each individual site as a WT trailhead. The Trailhead Plan or Sign Plan and any funding needs from the site owner/manager would be presented by WT staff for consideration by the PMT. The Trailhead Plans would include a summary of the Advisory Committee’s comments on the proposed site. In its meeting, the PMT would review the Trailhead Plan or Sign Plan and decide whether to designate the site as a trailhead. All of the meetings at which decisions will be made about trailhead designation would be open to the public.

Trailhead designation decisions, although guided by expert input from the Advisory Committee and other stakeholders, would be made by the PMT and only when fully supported by the owners/managers of each site and only after the requirements of CEQA have been satisfied. If the PMT and/or Conservancy board considers the environmental effects associated with the site under consideration to be inadequately assessed or mitigated, more environmental review would be needed, and the site owner or manager may need to carry out certain actions before the site would actually be designated. If all impacts or effects have been fully considered and adequately mitigated, designation would proceed.

The installation of an educational sign or its equivalent (such as integration of new information into an existing sign or information structure) would be a condition of trailhead designation. At non-HOSs, Trailhead Plans could have phased implementation, and trailhead designation could occur after the initial (minimum specified) components are implemented. While the PMT’s sole decision would be whether or not to designate a site as a trailhead, the PMT may also make

recommendations regarding funding requests to the Conservancy, Cal Boating, or other agency or non-profit organizations for development of certain features of a trailhead. Incorporating sites into the WT could influence funding decisions by grantors regarding those sites.

OTHER PROJECT APPROVALS

Outside of the trailhead designation process, site managers may seek other approvals, such as a permit from BCDC for signage or other site improvements. BCDC will apply its policies on recreation and wildlife to any trailhead improvement projects requiring a permit. This process also includes consideration of existing and pending accessibility requirements. The reviews by the Advisory Committee, PMT, WT staff and other stakeholders and experts would help flag issues that may be important in these other permitting or approval processes. There may be cases, however, in which the site manager needs to modify the Trailhead Plan to comply with requirements or requests from these other agencies granting permits or approvals. If the changes substantially alter the Trailhead Plan, then the project would go back to the PMT for additional review and decision about designation. The decision to submit the revised Trailhead Plan for further review would be made by the site owner/manager and WT staff. If, after implementation of improvements, the site owner or manager does not fulfill other components of the Trailhead Plan, then the site would not be designated.

TRAILHEAD PLAN IMPLEMENTATION

Once the Trailhead Plan has been developed, it would be the responsibility of the site owner/manager to implement the plan, including obtaining all necessary permits and approvals, and conducting any necessary CEQA review, as described above. All mitigation would be performed in accordance with the roles and responsibilities identified in the CEQA review. WT staff would serve as a liaison with the site owner/manager regarding implementation of the Trailhead Plan. WT staff would use their knowledge of the Trailhead Plan implementation status to determine when a site is ready to be officially included in the WT program. At that point, electronic information regarding the WT would be updated to include the newly-designated trailhead. Printed media would be updated on a scheduled basis, or when a certain number of new trailheads have been designated. WT staff would also work with the site owner/manager to track the implementation of WT-related mitigation measures to ensure that all measures are being implemented as required.

CHANGES TO SITE CONDITIONS OR STATUS

The WT Plan recommends periodic site reviews, or check-ins, at trailheads to identify if there are WT-related problems (e.g., user conflicts, overuse of facilities or non-compliance with rules). The frequency of these site reviews would vary, depending on the potential sensitivity or other particular conditions of the specific site.

The Trailhead Plan would identify who (usually site owners/managers) would be required to regularly review site conditions to verify that they remain consistent with the conditions described in the applicable CEQA documentation. WT staff would track the reviews to ensure that they are occurring with the specified frequency and to identify and try to resolve potential concerns, if any.

Trailhead issues would also come to the attention of WT and site managers through feedback from users or other interested stakeholders and experts. If potential WT-related problems or significant changes in site conditions were identified, WT staff would work with site owners/managers to resolve any problems. Major concerns or persistent problems would be brought to the PMT/Advisory Committee for discussion and input.

The goal in resolving potential trailhead issues would be to resolve the problem completely or to minimize it to an acceptable level of effects, while maintaining trailhead status. Means of achieving this goal will depend on the site and the issue, and may include implementation of more extensive management and stewardship programs, seeking funding to address structural problems, or recommending wildlife protection options such as seasonal trail closures, to name a few options.

“Removing” a designated trailhead from the WT network is an option for the PMT to take, but this “un-designation” would be a last resort. Once a trailhead is undesignated, the WT would no longer be involved, and the site would lose the benefits of WT education and outreach programs specific to that site. If a site is undesignated, it would be removed from all WT education and outreach media, and signage denoting the site as a trailhead would be removed. Most likely, access would remain open at the site, allowing problems to continue. The WT has no regulatory power to close a site or regulate management practices at a site.

2.4.4 OTHER WATER TRAIL IMPLEMENTATION TASKS

DEVELOPMENT OF WATER TRAIL SIGNAGE

The Conservancy would work with members of the PMT and other stakeholders to develop a WT logo. General signage specifications (size, content, colors, location, etc.) would be developed by the PMT and Advisory Committee. This would ensure that signage is compatible with other facilities at a site, has the appropriate safety and environmental protection educational content, identifies stewardship opportunities, and is developed to consider the needs of the site users with physical or other limitations. To facilitate BCDC review, BCDC would be involved in the development of the WT signage guidelines, and the guidelines would take into consideration typical BCDC permit requirements as described in the BCDC *Shoreline Signs Design Guidelines* (BCDC 2005).

FUNDING OF WATER TRAIL-RELATED IMPROVEMENTS

Site owners and managers currently provide the bulk of the funding for NMSB access improvements, and are expected to continue to do so in the future. Although the WT Act calls for the Conservancy to take the lead in efforts to fund WT-related improvements and other activities, the Conservancy cannot guarantee funding for the WT. Cal Boating has funded projects to enhance non-motorized small boating in the past, and is expected to continue to do so in the future, but funding levels vary from year to year. Non-profit organizations may also make grants for access or related improvements. Funding of WT-related improvements would require collaboration by a range of grant-making agencies and site owners/ managers.

COORDINATION OF WATER TRAIL EDUCATION PROGRAMS

The proposed education and stewardship programs were discussed in detail in Section 2.3.5. The Conservancy or another suitable organization would take the lead in developing materials that could serve as the basis for signage, printed educational materials, and training and instruction. Education would be delivered through a variety of media. Face-to-face training and instruction would continue to be delivered primarily by NMSB organizations and NMSB outfitters; however, training would likely be more comprehensive. In addition, NMSB users would be able to use the WT website and other information to easily access education and training resources.

DEVELOPMENT AND DISTRIBUTION OF WATER TRAIL INFORMATION

The publicity and public outreach program would work closely with the education and stewardship programs (see Section 2.3.5). The Conservancy or another suitable organization in charge of the education programs would also take the lead in developing and distributing information about the WT, and would take the lead in ensuring that a useful website is well managed and maintained. Information regarding the WT would be made available to all interested parties. In addition to the website, the Conservancy or another suitable organization would develop a guidebook and other printed information that could be distributed by NMSB organizations, site owners, operators, managers, and waterfront and water-oriented businesses. As discussed earlier, all publicity and public outreach materials would reinforce the responsible boating practices messages (WT ethic) contained in the WT educational program.

2.5 Permits and Approvals

The Conservancy would be responsible for revising the proposed WT Plan in accordance with mitigations and other desirable changes identified through the CEQA process described in this Draft EIR. Once the Plan is in final form and has been approved by the Conservancy, the WT PMT would be responsible for approval of required Trailhead Plans and Sign Plans for specific sites, and designation of specific access and destination sites as part of the WT. Each project would require CEQA review and approval by a lead agency. In addition, implementation of the Plan at specific sites may require approvals of one or more of the following agencies, depending on the specifics of the proposed actions:

- U. S. Army Corps of Engineers 404 and Section 10 permits, including compliance with the National Environmental Policy Act (NEPA)
- Federal Endangered Species Act consultation and State Endangered Species Act permits, and Essential Fish Habitat Consultation (National Marine Fisheries Service)
- DFG Streambed Alteration Agreements
- RWQCB 401 Water Quality Certification and/or Discharge Permit
- BCDC Shoreline Development Permit
- For projects on state lands, approvals from applicable California State land and water management agencies including:
 - State Parks
 - Cal Boating
 - California State Lands Commission
- For projects on federal lands, approvals from:

- USFWS (National Wildlife Refuge lands)
- NPS (National Park lands)
- Compliance with NEPA
- For projects on regional agency lands, regional agency approvals including
 - Regional parks and open space districts
- Local agency (city or county) approvals

Land use permitting agencies and requirements are described in greater detail in Section 3.13, Land Use.

3 ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

3.0 ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

3.1 INTRODUCTION

This chapter provides an evaluation of the potential impacts associated with implementation of the Water Trail Plan (WT Plan or Plan). This evaluation builds on the Initial Study (IS) for the project that was completed in November 2007 (Appendix B).

3.1.1 INITIAL STUDY FINDINGS

During the IS, the WT Plan was reviewed to identify which of 16 environmental and related resources included in the CEQA checklist could be affected by the implementation of the Plan. The IS concluded that, based on the activities that would potentially be conducted during implementation of the WT, nine resources could potentially be affected, and seven resources would not be affected at more than an insignificant level. The resources that would not be affected are:

- Agricultural Resources
- Air Quality
- Geology/Soils
- Mineral Resources
- Noise
- Population/Housing, and
- Utilities/Service Systems

These resources are not considered further in this document. Potential impacts to ten remaining resources are analyzed in detail in this chapter. The resources analyzed in this chapter are:

- Recreation
- Navigation
- Public Services
- Aesthetics
- Biological Resources
- Cultural Resources
- Hazardous Materials
- Hydrology and Water Quality
- Land Use Planning
- Transportation, Circulation, and Parking, and
- Greenhouse Gas Emissions and Climate Change (added since the Initial Study was completed)

3.1.2 ORGANIZATION OF CHAPTER 3

The introduction to Chapter 3 (Section 3.1) is followed by an overview of the regulatory setting for the entire project (Section 3.2). This introduction and overview are then followed by a detailed analysis of potentially affected resources (Sections 3.3 - 3.15).

Each resource-specific section (3.3 through 3.15) is organized in the same manner. A description of the regional and local setting for the resource and its specific regulatory setting are presented first, building on the information in the regulatory setting overview. This discussion is followed by a summary of the Initial Study findings for that resource, a description of the significance criteria used to determine whether impacts to the specific resource(s) are potentially significant, an explanation of the methodology used to evaluate potential impacts, identification and assessment of the potential impacts, and, if impacts may potentially be significant, the mitigation measures required to reduce the potential impact(s) to a less than significant level.

The impact analysis is divided into regional impacts and impacts that would occur on a site-specific level. Regional impacts would occur due to the implementation of the WT Plan as a whole, or from designation of a number of WT trailheads. Regional impacts or effects discussed in this chapter are associated solely with implementation of the WT. The potential *cumulative* impacts of the entire WT in combination with other projects are discussed in Chapter 4. Site-specific impacts would be associated with use of or potentially with facility construction at a specific location.

3.1.3 OVERVIEW OF IMPACT ANALYSIS IN CHAPTERS 3, 4, AND 5

As described in Chapter 2 (Project Description), the 24 strategies defined in the WT Plan would be used to guide the implementation of the WT. The strategies are an integral part of the WT Plan, and thus are an integral part of the project being evaluated in this document. The impact analysis therefore considers potential impacts that could occur as the WT is implemented using the appropriate strategies at both regional and local levels. While the intent of the strategies is to minimize or avoid potential impacts associated with the implementation of the WT, in certain cases, the strategies contained in the WT Plan may not suffice to ensure that all potential impacts remain less than significant, or may require additional specificity to ensure potential impacts remain less than significant. In these cases, mitigation would be required. Mitigation may take the form of specific modifications to existing strategies or new strategies. Other forms of mitigation may also be required to address a potential impact.

Significance criteria that define whether a potential impact would be considered significant were developed for each resource area. These criteria were derived from the criteria provided in the CEQA checklist. Where appropriate for this project, significance criteria were modified to provide more specific significance thresholds, or to more clearly define the potential range of effects that would be considered significant.

Under CEQA, agencies are required to mitigate all "significant" impacts if feasible. Significance "thresholds" may be fairly well defined and measurable (quantifiable), such as "exceeding air emissions standards," or they may require more qualitative judgment to be exercised in cases where, for example, CEQA Guidelines indicate that a significant effect will result if a "substantial" increase in a specific undesirable outcome would occur. This Program (or "Programmatic") EIR focuses on the impacts of the WT and its foreseeable effect on NMSB use over its entire geographic area, including activities carried out as part of the designation process and potential funding of trailhead facilities, rather than site-specific impacts associated with trailhead designation. Therefore, the mitigation measures provided in this document are also programmatic. They are intended to reduce or eliminate general types of program impacts that

are identified as possible at one or more sites or at a regional level. Some of these measures are programmatic revisions to the WT Plan. Others are intended to guide project-level environmental review, and to provide a menu of feasible mitigation options for mitigation at that time. Some mitigation measures would only apply to certain WT sites (e.g., may apply only to sites located near sensitive habitats). The determination whether or not a mitigation measure applies to any given site would be made during the site-specific CEQA review completed as part of the trailhead designation process. To streamline the site-specific CEQA review process, especially for High Opportunity Sites (HOSs), this EIR considers reasonable worst-case impacts that could occur at any site, and provides mitigation as feasible at the programmatic level. This document also provides guidance as to whether certain sensitive resources may be present in certain areas. Site-specific (project-level) review of potential impacts will occur during the trailhead designation process, and will rely on the programmatic evaluation to the extent that the programmatic evaluation is sufficiently detailed and applicable to site conditions and circumstances.

At the regional level, potential impacts are assessed by comparing the likely increase in NMSB use associated with implementation of the WT as a whole to the baseline of current use. The Cal Boating study of non-motorized boating in California found that NMSBs were used an estimated 5.3 million times in the Bay Area in 2006 (Cal Boating 2009),¹ and that participation in non-motorized small boating will increase by approximately 16.3 % by 2010 (an estimated 6.2 million participant-days) without the implementation of the WT. The implementation of the WT, while increasing safe boating practices and environmental awareness through the planned educational and outreach activities, is likely to result in only a small increase in use due to a variety of factors, as discussed in Chapter 2.

As required by CEQA, cumulative impacts of implementation of the WT Plan in conjunction with other similar projects (e.g., the Bay Trail) are also evaluated and are presented in Chapter 4. Finally, to form a basis for comparison, the proposed project (implementation of the Draft WT Plan, as analyzed in this chapter) is compared to the No Action alternative, and two other action alternatives – the “HOS Only” alternative, and the Enhanced Water Trail Plan alternative – in Chapter 5.

¹ This value is calculated based on the total number of participant days for the San Francisco Bay Region (an estimated 7.4 million, Table 2.13), and then subtracting the number of participant-days associated with inflatables (28.3%), which are not used on San Francisco Bay.

3.2 REGULATORY SETTING

This section presents an overview of the laws and regulations that potentially govern activities occurring in connection with implementation of the WT Plan. Water trail managers will work within the existing regulatory framework, and in partnership with land and resource managers to develop and manage access that is consistent with all federal, state and local regulations. Each resource section (beginning with Section 3.3) describes the specific components of the various laws and regulations that are applicable to that resource.

3.2.1 FEDERAL LAWS, REGULATIONS AND RELATED PLANS

Federal laws and regulations potentially applicable to the WT Plan include land use and planning, navigation, wildlife conservation, hazardous materials, air quality, cultural resource, and water quality laws and regulations.

NATIONAL ENVIRONMENTAL POLICY ACT OF 1969

The National Environmental Policy Act (NEPA) established environmental policy to ensure that federal decision makers take environmental impacts into account when evaluating the potential impacts of projects on federal land. NEPA's requirements apply to a federal agency decision to act, including financing, assisting, conducting, or approving projects or programs; agency rules, regulations, plans, policies, or procedures; and legislative proposals. Site-specific WT construction or improvement projects located on federal land would be subject to NEPA review. NEPA is administered by the Environmental Protection Agency (EPA) and implemented by the federal governmental agency involved in the decision that triggers the procedural requirements of NEPA.

PUBLIC TRUST DOCTRINE

The Public Trust Doctrine encompasses the notion that title to lands under navigable waters up to the high water mark is held by the state in trust for the people.² The U.S. Constitution grants states sovereignty over their tide and submerged lands, and the Supreme Court established the states' duty to protect (in perpetuity) the public's interest in these areas.³ The California Supreme Court has interpreted the range of public interest values in these waterways to include general recreation activities such as swimming and boating; and preservation of lands in their natural state as open space, as wildlife habitat, and for scientific study.^{4,5}

² The concept of a public trust resource originated in Roman law. Through U.S. federal and state constitutional and case law, the doctrine has been applied to these resources in the U.S. For a more detailed discussion of the evolution of public trust law in California, refer to the Public Trust Statements at the California State Lands Commission website: <http://www.slc.ca.gov/Policy%20Statements/Policy_Statements_Home.htm>

³ *Illinois Central Railroad v. Illinois*, 1892. 146 U.S. 387. The Public Trust Doctrine has yet to be applied to federal lands and waters through statutes or case law.

⁴ *Marks v. Whitney*. 1971. 6 Cal.3d 251; *National Audubon Society v. Superior Court*. 1983. 33 Cal.3d 419; *People v. California Fish Co.* 1913. 166 Cal. 576.

⁵ Frank, R.M. 1983. "Forever Free: Navigability, Inland Waterways, and the Expanding Public Interest. *University of California, Davis Law Review*, 16:579. California case law also establishes a link between navigation and recreation, and verges on treating the two as interchangeable public interests.

State and local governments have two forms of authority to manage navigation that enable them to strike a balance between recreation and environmental needs: (1) control over development of tide and submerged lands that can affect navigability of waterways, and (2) recreational boating rules. Under the first category, the State Lands Commission manages public uses of navigable waters through its leasing program. When a public or private entity applies for a permit to lease tide and submerged lands, the Commission reviews the application to ensure that the proposed use (e.g., a marina or pier) will maintain the public benefits of the overlying navigable waters. Usually the city or county fulfills this review role because most tide and submerged lands are owned by local authorities through past legislative grants of state lands.

Under the second category, recreational boating rules in Section 660 of the Harbors and Navigation Code empower local governments to establish ordinances that regulate navigation in waters within their jurisdiction through time-of-day restrictions, speed zones, special-use areas, and sanitation and pollution controls.⁶

THE INLAND NAVIGATION RULES ACT OF 1980 AND THE PORTS AND WATERWAYS SAFETY ACT OF 1972

In the United States, two sets of regulations govern navigation. The Inland Navigational Rules Act of 1980 (33 USC Chapter 34, Subchapter I, Part A), more commonly known as the Inland Rules, governs navigation in the Bay and associated rivers and inland waterways. These rules are described in Chapter 2.

The second set of regulations, the Ports and Waterways Safety Act of 1972 (Title 33, Chapter 25, Section 1221), authorized the U. S. Coast Guard (USCG) to establish, operate, and maintain vessel traffic services for ports, harbors, and other waters subject to congested vessel traffic. As a result, in 1972 the USCG established the Office of Vessel Traffic Management to maintain the Vessel Traffic Service (VTS) for San Francisco Bay. The Office designates traffic lanes for inbound and outbound vessel traffic, specifies separation zones between vessel traffic lanes, and sets up rules to govern vessels entering and leaving ports. The USCG operates the VTS, which acts as a clearinghouse of real-time information on commercial vessel movements in the Bay. The USCG monitors all commercial, Navy, ferry, tug, dredging, tanker, passenger ship and marine traffic within San Francisco Bay and local coastal waters. The USCG recommends, but generally does not require, recreational and fishing vessels to participate in the VTS; however, they “are encouraged to monitor the VTS channels, as needed, to gather traffic movement information” (USCG 2009). The VTS is also described in Chapter 2.

NATIONAL PARK SERVICE ORGANIC ACT OF 1916

The National Park Service (NPS) Organic Act of 1916 establishes a dual mission for the park system: to conserve natural and historic features and wildlife, while providing for public enjoyment of these features.⁷ The NPS owns and manages three bayfront National Parks with water trail sites: the Golden Gate National Recreation Area (GGNRA), the San Francisco Maritime National Historic Park, and the Rosie the Riveter/ World War II Home Front National

⁶ Harbors and Navigation Code §660 (b); and *Personal Watercraft Coalition v. Marin County Board of Supervisors*, 2002. 100 Cal. App. 4th 129; and *People ex. rel. Younger v. County of El Dorado*, 96 Cal App.3d. 403.

⁷ 16 U.S.C. §1

Historical Park. NPS Management Policies stipulate that park managers only allow uses that are “(1) appropriate to the purpose for which the park was established, and (2) can be sustained without causing unacceptable impacts to park resources or values. Recreational activities and other uses that would impair a park’s resources, values, or purposes cannot be allowed.”⁸ Recreation policies for these parks, and other WT sites, will be addressed in detail as part of the trailhead designation process.

AMERICANS WITH DISABILITIES ACT OF 1990

The Americans with Disabilities Act of 1990 (ADA) generally prohibits the denial of services or benefits on the basis of physical or mental disability. The ADA mandates that individuals with disabilities must be given an equal opportunity to access public facilities and that reasonable accommodations must be made to account for physical and mental limitations of individuals with disabilities. Title II of the ADA ensures accessibility to government programs, services and activities and also requires State government to follow accessibility requirements standards of Section 508 of the Federal Rehabilitation Act, which ensures the accessibility of electronic and information technology. The Department of the Interior and other federal agencies oversee the implementation of the Act within their jurisdictions. Water Trail Strategy 10 calls for development or improvement of launch facilities to make them accessible to individuals with disabilities.

The ADA does not provide definitive measures of accessibility; accessibility guidelines are developed pursuant to the ADA to provide measurable guidelines for compliance. The ADA Accessibility Guidelines (ADAAG) were published in 1991; however, the recreational facilities portion was held in reserve pending development of appropriate guidelines. Recreational accessibility guidelines were initially developed in 2002, and then merged with guidelines from the 1968 Architectural Barriers Act (ABA) in 2004 to develop ADA-ABA Accessibility Guidelines (ADA-ABA AGs). Oversight and enforcement of the ADA-ABA AGs fall under at least four different agencies. The United States General Services Administration (GSA) has jurisdiction over federal agencies, while the United States Department of Justice (DOJ) has jurisdiction over states, local agencies, and the private sector. GSA approved the federal (ABA) component of the ADA-ABA AGs; however, DOJ has not yet approved the ADA-ABA AGs, and guidelines remain pending. Thus, while access guidelines for many land-side facilities (such as routes to and through parking areas, restrooms, parking, picnic areas, walkways, and railings) were addressed many years ago, and are well established, there are no approved accessibility guidelines for recreational boating facilities (marina berthing facilities and boat launching facilities). Compliance with ADAAG for accessible land-side facilities and compliance with pending ADA-ABA Accessibility Guidelines for recreational boating facilities would be addressed as part of project-level CEQA review and permitting.

THE NATIONAL HISTORIC PRESERVATION ACT OF 1966

The National Historic Preservation Act (NHPA) (16 U.S.C. 470) created the Advisory Council on Historic Preservation (ACHP), an independent Federal agency, to advise the President and Congress on matters involving historic preservation. The ACHP is authorized to review and

⁸ National Park Service. 2001. Management Policies. Chapter 8.1. Retrieved February 27, 2006 from: <http://www.nps.gov/refdesk/mp/>

comment on all actions licensed by the Federal government which will have an effect on properties listed in the National Register of Historic Places, or are eligible for such listing. The regulations implementing Section 106 (36 CFR Part 800), as amended, of the NHPA require a federal agency with jurisdiction over a federal, federally-assisted, or federally-licensed undertaking to identify all cultural properties on land under its control or jurisdiction that meet the criteria for inclusion in the National Register of Historic Places (NRHP). The regulations also require that the Advisory Council on Historic Preservation be given an opportunity to comment on those actions which may affect these resources.

THE AMERICAN INDIAN RELIGIOUS FREEDOM ACT OF 1978

The American Indian Religious Freedom Act of 1978 requires federal agencies to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiians, including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites.

FEDERAL ENDANGERED SPECIES ACT

The purpose of the Federal Endangered Species Act (ESA) of 1973 is to conserve species populations that are endangered or threatened and therefore require special protection. The Act provides mechanisms for listing species as endangered or threatened, identifying critical habitat areas used by these species, and establishes criminal penalties for the “take” of listed wildlife and fish. Take means to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct,” and includes significant habitat alteration where such alteration kills or injures a listed species through impairment of essential behavior. Harass means “an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering.”⁹ Responsibility for implementing this Act is shared by the U.S. Fish and Wildlife Service (USFWS) for terrestrial and freshwater species and the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NOAA Fisheries Service) for marine and anadromous species.

NATIONAL WILDLIFE REFUGE SYSTEM ADMINISTRATION ACT OF 1966 AND NATIONAL WILDLIFE REFUGE SYSTEM IMPROVEMENT ACT OF 1997

The National Wildlife Refuge System Administration Act of 1966 conserves and protects listed endangered and threatened species and migratory birds through protection and restoration of species’ habitats, and by managing uses, such as recreation, of Refuge areas to prevent negative impacts to these species. The National Wildlife Refuge System Improvement Act of 1997 designates wildlife-dependent recreational uses involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation as “priority general public uses.” When these activities are compatible with species protection goals (as determined by USFWS), they are welcome on refuges and receive priority over other uses. In the San Francisco Bay area, the USFWS owns and manages National Wildlife Refuges and Bay waters totaling

⁹ 50 C.F.R 17.3

30,000 acres. The San Francisco Bay Refuge complex comprises a significant portion of the Bay environment, and includes the following:

- Don Edwards San Francisco Bay National Wildlife Refuge
- Marin Islands National Wildlife Refuge, and
- San Pablo Bay National Wildlife Refuge

THE MIGRATORY BIRD TREATY ACT (MBTA) OF 1918

The Migratory Bird Treaty Act (MBTA) of 1918 implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. The MBTA prohibits take of waterfowl, shorebirds, songbirds, hawks, and others. Both USFWS and DFG are responsible for implementing the MBTA and issue permits for incidental take of migratory birds, as well as hunting licenses for game species.

THE MARINE MAMMAL PROTECTION ACT (MMPA) OF 1972

The goal of the Marine Mammal Protection Act (MMPA) of 1972 is to reduce marine mammal mortalities and injuries; the MMPA regulates scientific research in the wild and other activities to protect marine mammals. It protects all marine mammals, including cetaceans (whales, dolphins, and porpoises), pinnipeds (seals and sea lions), sirenians (manatees and dugongs), sea otters, and polar bears within the waters of the United States. Under the MMPA, it is unlawful to “take” any marine mammal. Take includes harassment or attempting to harass, feed, hunt, capture, collect, or kill any marine mammal. USFWS is responsible for implementing the MMPA for otters (and certain other species not found in the Bay), while NOAA Fisheries Service is responsible for all other marine mammals.

THE CLEAN WATER ACT, SECTION 404, AND THE RIVERS AND HARBORS ACT, SECTION 10

Section 404 of the Clean Water Act (CWA) requires authorization from the U.S. Army Corps of Engineers (Corps) for work involving placement of fill into any “waters of the United States.”¹⁰ Section 10 of the Rivers and Harbors Act¹¹ requires Corps authorization for work or structures in or affecting navigable waters of the U.S.

A WT project developing or improving trail access to rivers, streams, or in wetland areas will likely require a permit from the Corps. Under the Corps’ general policy, a project should:

1. Provide public benefits that outweigh foreseeable detriments
2. Not unnecessarily alter or destroy wetlands
3. Conserve wildlife
4. Be consistent with water quality standards
5. Protect historic, scenic, and recreational values
6. Not interfere with adjacent properties or water resources projects, and
7. Comply with approved coastal zone management programs.¹²

¹⁰ 33 U.S.C. §1344

¹¹ San Francisco Bay Trail Project. March 2001. The Bay Trail: Planning for a Recreational Ring Around San Francisco Bay. Association of Bay Area Governments. Oakland, CA. p.II-2; and 33 U.S.C. §1344 and §403.

¹² 33 C.F.R. §320.4

These approval criteria are important considerations in trail planning and trailhead design. (Clean Water Act section 401 requirements are discussed below under state laws.)

THE MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The Magnuson-Stevens Fishery Conservation and Management (Magnuson-Stevens) Act establishes a management system for national marine and estuary fishery resources. The Act requires all federal agencies to consult with the NOAA Fisheries Service regarding all actions or proposed actions permitted, funded, or undertaken that may adversely affect essential fish habitat (EFH). Essential fish habitat is defined as waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity. The legislation states that migratory routes to and from anadromous fish spawning grounds should also be considered EFH. Within the context of the Magnuson-Stevens Act, the phrase “adversely affect” refers to the creation of any impact that reduces the quality or quantity of EFH. Federal activities that occur outside an EFH but that may nonetheless have an impact on EFH waters and substrate also must be considered in the consultation process. Under the Magnuson-Stevens Act, effects on habitat managed under the Pacific Salmon Fishery Management Plan must be considered as well.

The Magnuson-Stevens Act states that consultation regarding EFH should be consolidated, where appropriate, with the interagency consultation, coordination, and environmental review procedures required by other federal statutes, such as NEPA, CWA, and ESA. Essential fish habitat consultation requirements can be satisfied through concurrent environmental compliance requirements if the lead agency provides NOAA Fisheries Service with timely notification of actions that may adversely affect EFH and if the notification meets the requirements for EFH assessments.

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 AND THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as Superfund) provides broad regulatory authority to respond to releases or threatened releases of hazardous substances that may affect public health or the environment. The Act establishes the requirements for identification, evaluation, and remediation of abandoned (non-operating) hazardous waste sites. It provides for both short-term responses to hazardous releases and long-term permanent reduction in the hazard level at sites on a National Priority List (NPL). The NPL list is made up of sites with known or suspected releases of hazardous substances, pollutants or contaminants. The NPL has 33 Final NPL sites and one proposed site that are located within the Bay Area. CERCLA also mandates training for hazardous waste site workers. The Superfund Amendments and Reauthorization Act of 1986 (SARA) provides a regulatory program for underground storage tanks and the Emergency Planning and Community Right-To-Know Program (EPCRA).

RESOURCE CONSERVATION AND RECOVERY ACT OF 1980 AND HAZARDOUS AND SOLID WASTE AMENDMENTS OF 1984

The Resource Conservation and Recovery Act of 1980 and Hazardous Solid Waste Amendments of 1984 define the solid (including hazardous) waste management and control responsibilities of site owners and operators at active facilities. RCRA governs generation, handling, storage, transportation, treatment, and disposal of hazardous wastes. It also provides requirements for

testing to determine whether a given solid waste is hazardous, and requires site owners and operators to ensure that potential contaminants released onto their property remain within the property boundary. Where hazardous waste releases may have occurred, RCRA requires investigation and remediation sufficient to ensure that off-site areas remain unaffected and/or remediation of any affected off-site areas. In 1986 amendments the Act was revised to include the regulation of underground tanks storing petroleum products and hazardous substances. In California, RCRA is implemented by the California Environmental Protection Agency Department of Toxic Substances Control. Under California law, petroleum products are also considered hazardous waste, although they are not included as hazardous waste under RCRA. The Hazardous and Solid Waste Amendments (HSWA) to RCRA focused on waste minimization, phasing out land disposal of hazardous waste and corrective action for releases (EPA 2009a).

COASTAL ZONE MANAGEMENT ACT OF 1972

The purpose of the Coastal Zone Management Act (CZMA) is to preserve, protect, and restore or enhance the nation's coastal zones. The Act is administered by the states; for the San Francisco Bay it is administered by the San Francisco Bay Conservation and Development Commission (BCDC) as described under the McAteer-Petris Act, below.

OIL POLLUTION ACT OF 1990

The Oil Pollution Act of 1990 (OPA) was passed to expand the government's ability to respond to oil releases and provide funding for those spill cleanups, and increase enforcement and penalties for non compliance (EPA 2009b). It also provided new requirements for contingency planning developed in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

EXECUTIVE ORDER 11990—PROTECTION OF WETLANDS

This federal Executive Order (issued in 1977, in furtherance of NEPA) protects wetlands and requires that all federal agencies minimize the destruction, loss or degradation of wetlands, and preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for (1) acquiring, managing, and disposing of federal lands and facilities; and (2) providing federally undertaken, financed, or assisted construction and improvements; and (3) conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities (42 FR 26961, 3 CFR, 1977 Comp).

3.2.2 STATE AND REGIONAL LAWS, REGULATIONS, AND RELATED PLANS

THE CALIFORNIA ENDANGERED SPECIES ACT

The California Endangered Species Act (CESA) has objectives and requirements that are similar to those of the federal ESA except that a permit is required for incidental take of *all* state listed species (including plants).¹³ The California Department of Fish and Game (DFG) implements CESA.

¹³ California Fish and Game Code §2080

Agencies or other organizations must consult with DFG on proposed actions (e.g., issuing permits, funding projects) that could jeopardize endangered or threatened species. Section 2081 of CESA provides a means by which agencies or individuals may obtain authorization for incidental take of state-listed species, except for certain species designated as “fully protected” under the California Fish and Game Code. Under Section 2081, a take must be incidental to, and not the purpose of, an otherwise lawful activity. Requirements for a Section 2081 permit are similar to those used in the ESA Section 7 process. In general, the requirements include identification of impacts on listed species; development of mitigation measures that minimize and fully mitigate impacts; development of a monitoring plan; and assurance of funding to implement mitigation and monitoring.

CALIFORNIA NATIVE PLANT PROTECTION ACT (NPPA)

In addition to the California Endangered Species Act, the Native Plant Protection Act (NPPA, Fish and Game Code Section 1900, et seq.) protects endangered and “rare” species, subspecies, and varieties of native California plants. The species listed under this law, which preceded CESA, now overlap with those of CESA. NPPA contains many exemptions for agriculture and forestry, and many exceptions, but otherwise generally prohibits unauthorized “take” of listed plants. NPPA contains “notice and salvage” provisions that require landowners to notify DFG to “salvage” (rescue by transplanting – a technique no longer generally scientifically supported) listed plants in the path of land-clearing or development activities.

CALIFORNIA MARINE LIFE PROTECTION ACT OF 1999

The Marine Life Protection Act (MLPA) requires 1) the reevaluation of all marine protected areas (MPAs) and 2) designation of new MPAs, if needed, to achieve the goal of creating a cohesive network of protected marine areas. The MPAs are made up of state marine reserves, state marine parks, and state marine conservation areas, which are being developed by region to meet specific regional goals. An initiative to improve the MPAs in and around San Francisco Bay will be completed by 2011. Most existing MPAs are offshore, but Fagan Marsh State Marine Park, Corte Madera State Marine Park, Marin Islands State Marine Park, Alameda Mudflats State Marine Park, Robert Crown State Marine Conservation Area, Redwood Shores State Marine Park, Bair Island State Marine Park, and Peytonia Slough State Marine Park are within the project area. The MLPA places restrictions on consumptive uses such as fishing as well as non-consumptive recreational uses; the specific restrictions are dependent on the level of protection for a given site and the species of interest within the area.

PORTER-COLOGNE WATER QUALITY CONTROL ACT OF 1969, SECTION 401 OF THE FEDERAL CLEAN WATER ACT, AND THE REGIONAL WATER QUALITY CONTROL BOARD BASIN PLAN

The Porter-Cologne Water Quality Act (PCWQCA) derives its authority from the federal CWA. The PCWQCA provides the state with broad jurisdiction over water quality and waste discharge, and also provides the state the authority to prepare regional Basin Plans to protect the state’s water resources. Under the PCWQCA and Section 401 of the federal CWA, the State Water Resources Control Board and the San Francisco Regional Water Quality Control Board (SFRWQCB) regulate discharges to surface waters (including wetlands), groundwater, and point and non-point sources of pollution. The Basin Plan designates existing and potential beneficial uses for each water body within its geographic region, sets numeric and narrative water quality

objectives to protect the beneficial uses, and describes strategies and time schedules for achieving these water quality objectives.

The SFRWQCB permit authority includes the issuance of waste discharge requirements and conditions on CWA Section 401 water quality certification authorizations. Such permits may be required for projects to develop or improve Water Trail access sites. In addition, where a discharge of waste to land has occurred and threatens or may threaten groundwater quality, the SFRWQCB may require remediation and clean-up of the waste and affected soil and groundwater. Because the PCWQCA derives its authority from the Clean Water Act, it regulates petroleum products, and provides regulations for the installation, operation, and remediation of above ground and underground petroleum storage tanks.

CALIFORNIA HARBORS AND NAVIGATION CODE

Under the authority of the Federal Boating Act of 1958, the State Harbors and Navigation Code was amended to provide registration of vessels by the State of California instead of the Coast Guard and establish a comprehensive set of state laws and regulations governing the equipment and operation of vessels on all waters of the state. The Harbors and Navigation Code authorizes the California Department of Boating and Waterways (Cal Boating) to establish and enforce recreational boating operation and equipment regulations in conformity with federal navigation rules promulgated by the Coast Guard. Most of these rules address boating practices, equipment requirements and liability issues.¹⁴ The mission of Cal Boating is to provide safe and convenient public access to California's waterways and leadership in promoting the public's right to safe, enjoyable, and environmentally sound recreational boating.¹⁵

LEMPERT-KEENE-SEASTRAND OIL SPILL PREVENTION AND RESPONSE ACT OF 1990

In 1990, the California state legislature enacted the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act (OSPR) (California Government Code Chapter 7.4). OSPR created, among others, the Harbor Safety Committee of the San Francisco Bay Region. The purpose of the Harbor Safety Committee is to prepare a Harbor Safety Plan that considers all vessel traffic to ensure safe navigation and operation of tankers, barges, and other vessels. The original Harbor Safety Plan for San Francisco, San Pablo and Suisun Bays was adopted in 1992. The most recent available San Francisco Bay Region Harbor Safety Plan is for 2009. The Committee meets regularly to develop additional strategies to further safe navigation and oil spill prevention.

STATE SCENIC HIGHWAY PROGRAM

The State Scenic Highway Program was established in 1963 to preserve and protect scenic highway corridors from changes that would diminish the aesthetic value of lands adjacent to highways. Scenic highway nominations are evaluated using the following criteria:

¹⁴ Harbors and Navigation Code §660 (b). In terms of managing access on navigable waters, the department makes rules within cities, counties or other political subdivisions where “no special rules or regulations exist,” or when “the department determines that the local laws regulating the use of boats or vessels on that body of water are not uniform and that uniformity is practicable and necessary.”

¹⁵ Harbors and Navigation Code §660 (a).

- The State or county highway being considered consists of a scenic corridor comprised of a memorable landscape that showcases the natural scenic beauty or agriculture of California
- Any existing visual intrusions do not significantly impact the scenic corridor
- There is demonstrated strong, local support for the proposed scenic highway designation, and
- The proposed scenic highway is not less than a mile and is not segmented.

For a highway to be officially designated as a State Scenic Highway, a local jurisdiction must define the scenic corridor that is adjacent to and visible to a motorist on the highway, adopt a scenic corridor protection program, apply to the California Department of Transportation (Caltrans) for a scenic highway approval, and receive notification that the highway has been adopted as a Scenic Highway. The agency must then adopt or document ordinances to preserve the scenic quality of the corridor.

CALIFORNIA FISH AND GAME CODE STREAMBED ALTERATION AGREEMENTS

In 2003, the California Legislature repealed and re-enacted with modification Section 1600 of the Fish and Game Code. Its primary purpose is the protection of the state's fish and wildlife resources from harmful impacts of activities that occur near any rivers, streams, lakes and other water bodies in the state, regardless of the amount or duration of flow. "Fish" are broadly defined in the Fish and Game Code (Section 45) as aquatic organisms, including mollusks, crustaceans, invertebrates, or amphibians. Prior to undertaking stream-altering activities that may adversely affect fish or wildlife, applicants must notify DFG, pay fees, and enter into an agreement with DFG for authorization. DFG may authorize (for up to five years) alteration of streams with scientifically sound, reasonable conditions to avoid or minimize harm (substantial adverse effects) and protect fish and wildlife resources. DFG has discretionary authority to modify the conditions of a Section 1600 Stream Alteration Agreement.

THE CALIFORNIA HAZARDOUS WASTE CONTROL LAW OF 1972 AND AMENDMENTS

The California Hazardous Waste Control Law (HWCL) is the state equivalent of RCRA (DTSC 2009). The HWCL is the state's basic hazardous waste law and has been amended to address current requirements and bring it into compliance with federal law. The act is similar to RCRA in its requirements for hazardous waste but is more stringent in the regulation of non-RCRA wastes, including aspects such as small quantity generators, transportation, recycling, and permitting.

CARPENTER-PRESLEY-TANNER HAZARDOUS SUBSTANCE ACCOUNT ACT OF 1981

The Hazardous Substance Account Act (HSAA) is the state's equivalent of CERCLA (CalEPA 2009). It is similar to CERCLA except in areas of assigning liability for a site and in particular for petroleum site clean-up. This Act established an account to cover the cost of cleanup, response equipment and associated activities for the hazardous waste disposal.

HAZARDOUS WASTE AND SUBSTANCES SITES (CORTESE) LIST

All hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code (HSC) are documented in the Hazardous Waste and Substance Sites List

(also known as the “Cortese list”). This list, created pursuant to California Government Code Section 65962.5, is updated annually by local governments.

CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006

In 2006, California passed the California Global Warming Solutions Act of 2006¹⁶ (AB 32), which requires the California Air Resources Board (CARB) to design and implement emission limits, regulations, and other measures, such that statewide greenhouse gas emissions will be reduced to 1990 levels by 2020. AB 32 establishes regulatory, reporting, voluntary, and market mechanisms to achieve quantifiable reductions in GHG emissions to meet the statewide goal.

In December 2007, CARB approved the 2020 emission limit of 427 million metric tons of carbon dioxide equivalents¹⁷ (CO₂e). The 2020 target of 427 million metric tons of CO₂e requires the reduction of 169 million metric tons of CO₂e, or approximately 30 percent, from the state’s projected 2020 emissions of 596 million metric tons of CO₂e (business-as-usual). The total reduction for the recommended measures is 174 million metric tons/year of CO₂e, slightly exceeding the 169 million metric tons/year of CO₂e of reductions estimated to be needed.

CARB released the Climate Change Proposed Scoping Plan in October 2008 (CARB 2008). The Proposed Scoping Plan proposes a comprehensive set of actions designed to reduce overall carbon emissions in California. Key elements of the Proposed Scoping Plan include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards
- Achieving a statewide renewable energy mix of 33 percent
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California, and pursuing policies and incentives to achieve those targets
- Adopting and implementing measures pursuant to existing state laws and policies, including California’s clean car standards, goods movement measures, and the Low Carbon Fuel Standard, and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state’s long-term commitment to AB 32 implementation.

The Climate Change Proposed Scoping Plan includes recommended measures that were developed to reduce greenhouse gas emissions from key sources and activities while improving public health, promoting a cleaner environment, preserving our natural resources, and ensuring that the impacts of the reductions are equitable and do not disproportionately impact low-income and minority communities. These measures also put the state on a path to meet the long-term 2050 goal of reducing California’s greenhouse gas emissions to 80 percent below 1990 levels.

¹⁶ Assembly Bill No. 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.

¹⁷ Greenhouse gases vary in their ability to trap heat. To simplify evaluation of potential greenhouse gas emissions, scientists convert the various gases to carbon dioxide equivalents; i.e., how much carbon dioxide it would require to have the same heat-trapping effect as the amount of the other gas(es) in question.

These measures were presented to and approved by the CARB on December 11, 2008. The measures in the Proposed Scoping Plan will be in place by 2012.

SENATE BILL 97

In August 2007, California adopted Senate Bill 97¹⁸ (SB 97). The legislation provides partial guidance on how GHG emissions should be addressed in certain CEQA documents. SB 97 required the Governor's Office of Planning and Research (OPR) to prepare CEQA guidelines for the mitigation of GHG emissions, including, but not limited to, effects associated with transportation or energy consumption. OPR and the Resources Agency are required to periodically review the guidelines to incorporate new information or criteria adopted by CARB pursuant to the Global Warming Solutions Act (criteria are due by 2012).

Under this legislation, on December 30, 2009, the Resources Agency adopted amendments to the CEQA Guidelines, which describe the process and methodology for assessing the effects of GHG emissions under CEQA. It then transmitted the adopted amendments and the entire rulemaking file to the Office of Administrative Law (OAL). The amendments are final and took effect on March 18, 2010.

Although the amended Guidelines provide direction on the process and methodology for assessing a project's GHG emissions, the amendments do not establish any bright-line threshold for determining significance of GHG emissions, whether as an individual effect or a cumulative one. Likewise, CARB has not yet established any specific criteria or thresholds.

CALIFORNIA STATE PARKS SYSTEM AND THE CALIFORNIA RECREATIONAL TRAILS ACT OF 1978

California's Department of Parks and Recreation (State Parks) has a mission to "provide for the health, inspiration and education of the people of California by helping to preserve the state's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation."¹⁹ The California Recreational Trails Act of 1978 (CRTA) was enacted to increase accessibility and enhance the use, enjoyment, and understanding of California's scenic, natural, historic, and cultural resources. One of the stated goals of the act is to increase opportunities for recreational boating on designated waterways (PRC 5070.5(d)). CRTA and the mission of State Parks are implemented through a series of plans, including the State Parks Strategic Plan, State Parks System Plan of 2002, and 2009 California Recreational Trail Plan. In addition, each park has a general plan that describes the specific purpose of the park and the planned use for the facilities.

The State Parks strategic plan outlines five core programs for the park system: resource protection, education/interpretation, provision of facilities (including camping and restrooms) at parks, public safety, and recreation. Each park has a general plan that describes the specific purpose of the park and the planned use for the facilities. The State Parks System Plan of 2002 (State Parks 2002b,c) describes how the State Parks System will advance its primary goals, including outdoor education and recreation. State Parks' *California Recreational Trail Plan*

¹⁸ Chapter 185, Statutes 2007

¹⁹ Department of Parks and Recreation. 2004. Retrieved on March 9, 2006 from the CA State Parks website: <http://www.parks.ca.gov/?page_id=91>

(State Parks 2009b) further describes the goals of the Parks System trails, which include the following (State Parks 2009a):

- Promote and encourage the incorporation of trails and greenways development and linkages into all local and statewide land use planning processes
- Develop and encourage expanded cooperation and collaboration among trail advocates, wildlife advocates, and cultural resource advocates to maximize resource protection, education, and trail use opportunities
- Promote adequate design, construction, relocation, and maintenance of trails in order to optimize public access and resource conservation, and
- Encourage public use of and support for trails programs throughout California

State Parks manages five parks of relevance to the Water Trail project – Benicia State Recreation Area, China Camp State Park, Angel Island State Park, East Shore State Parks, and Candlestick Point State Recreation Area.

CALIFORNIA DISABILITY STATUTES

In 1992 the California Legislature amended the Unruh Civil Rights Act (California Civil Code Section 51) to extend protection from discrimination to those with disabilities and, at the same time amended or added provisions to other related laws to substantially increase the protections afforded persons with disabilities.

California Civil Code sections 54-55.2 require access for persons with disabilities and provide that “individuals with disabilities or medical conditions have the same right as the general public to the full and free use of the streets, highways, sidewalks, walkways, public buildings, medical facilities, including hospitals, clinics, and physicians' offices, public facilities, and other public places.”

California Government Code sections 11135-11139.8 require protection from discrimination in any program or activity that is conducted, funded directly by, or receives any financial assistance from the State. These provisions bring into State law the protection of Title II of the ADA. Programs and activities subject to these provisions must meet the protections of the laws of California or the ADA, whichever is stronger.²⁰

Under California Government Codes sections 4450 et seq., all buildings, structures, sidewalks, curbs, and related facilities, that are constructed using state, county, or municipal funds, or the funds of any political subdivision of the state are required to be accessible to and usable by persons with disabilities. Regulations adopted under this statutory requirement and with which such construction must comply are found in Title 24 of the California Code of Regulations.

California does not have any statutes that definitively address accessibility of boating facilities. Guidelines will be developed when DOJ approves the pending ADA-ABA Accessibility Guidelines. The only California requirement that exists is in Section 1132B.2.4 of the California Building Code (for Parks and Recreational Areas). It simply states:

“Boat docks. Boat docks, fishing piers, etc. shall be accessible.”

²⁰ *People v. Levinson*, 155 Cal. App. 3d 13, 16 (1984)

EXECUTIVE ORDER W-59-93, CALIFORNIA WETLANDS CONSERVATION POLICY

This state policy established by the Governor of California in 1993 provides substantive environmental goals to ensure no overall net loss of wetlands, and to achieve a long-term net gain in the quantity, quality, and permanence of wetlands in California, with due concern for private property and stewardship.

EXECUTIVE ORDER S-3-05

In 2005, in recognition of California’s vulnerability to the effects of climate change, Governor Schwarzenegger established Executive Order S-3-05. Executive Order S-3-05 proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra’s snowpack, further exacerbate California’s air quality problems, and potentially cause a rise in sea level. To combat those concerns, the Executive Order established total GHG emission targets. Specifically, emissions are to be reduced progressively to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050. These targets are consistent with the targets in AB 32.

THE McATEER-PETRIS ACT OF 1969 AND THE SUISUN MARSH PRESERVATION ACT OF 1977

The McAteer-Petris Act of 1969 and the Suisun Marsh Preservation Act of 1977 establish the authority of BCDC to issue and deny permits for Bay filling; extracting materials; changing the use of any land, water, or structure within the area of its jurisdiction; dredging; Bay-related shoreline development; and marsh development. The design and implementation of all WT improvements including signs will be within the jurisdiction of BCDC and may require BCDC permits.

BCDC’s *San Francisco Bay Plan*, as amended (Bay Plan) (BCDC 2007a) identifies five types of priority use areas (ports, water-related industry, water-oriented recreation, airports and wildlife refuges) and provides development policies for these areas. In issuing permits for shoreline development, BCDC must require applicants to provide “maximum feasible public access.” The Bay Plan Public Access policies include specific requirements for permit applicants to prevent significant adverse effects on wildlife, habitat, and water quality. Specific guidelines developed by BCDC for public access improvements along the Bay shoreline are summarized in *Shoreline Spaces: Public Access Design Guidelines for the San Francisco Bay* (BCDC 2005).

The Suisun Marsh Protection Plan was developed by BCDC in response to the Suisun Marsh Preservation Act. The goals of the Suisun Marsh Protection Plan are to “preserve the integrity and assure the continued wildlife use of the Suisun Marsh.”²¹ The plan requires local agencies to develop local protection programs to bring county policies and ordinances into conformity with the Suisun Marsh Preservation Act. The Plan’s findings and policies on Recreation and Access support provision of public access and recreation as long as it does not adversely impact the environmental or aesthetic qualities of the Marsh.²²

²¹ San Francisco Bay Conservation and Development Commission (BCDC). 1976. Suisun Marsh Protection Plan. San Francisco, CA, p. 9.

²² BCDC 1976, pp. 28-29.

ASSOCIATION OF BAY AREA GOVERNMENTS – BAY TRAIL PLAN

The San Francisco Bay Trail is a planned recreational corridor designed to encircle San Francisco and San Pablo Bays with a continuous 500-mile network of bicycling and hiking trails. To date, approximately 300 miles of the alignment have been completed. Depending on the location of its segments, the Bay Trail consists of paved multi-use paths, dirt trails, bike lanes, sidewalks or city and county streets signed as bike routes.

The Bay Trail Plan was adopted by the Association of Bay Area Governments (ABAG) in July 1989 (ABAG 1989). It includes a proposed alignment; a set of policies to guide the future selection, design and implementation of routes; and strategies for implementation and financing. Bay Trail policies and design guidelines are intended to complement rather than supplant the adopted regulations and guidelines of local managing agencies. The majority of jurisdictions along the Bay Trail alignment have incorporated it into their general plans.

Bay Trail alignment policies reflect the goals of the Bay Trail program, which highlights the wide variety of recreational and interpretive experiences offered by the diverse Bay environment. The Bay Trail offers access to commercial, industrial and residential neighborhoods; points of historic, natural and cultural interest; recreational areas like beaches, marinas, fishing piers, boat launches, and over 130 parks and wildlife preserves totaling 57,000 acres of open space. Bay Trail policies also include the investigation of water trails as an enhancement to the shoreline trail system. The Bay Trail currently passes within close proximity (approximately 1,000 feet) of 72 of the 112 WT Backbone Sites (see Table 3.3.3-1).

SAN FRANCISCO BAY WATER EMERGENCY TRANSPORTATION AUTHORITY (WETA)

The San Francisco Bay Water Emergency Transportation Authority (WETA) is a regional agency authorized by the State of California (SB 976) with control of all public transportation ferries in the Bay Area region, except those owned and operated by the Golden Gate Bridge District. It was created in 2007 from the San Francisco Bay Water Transit Authority (WTA). The WTA adopted an Implementation and Operations Plan which describes the current ferry system within the Bay (WTA 2003). WETA has also adopted the Final Transition Plan, which describes the expansion of the existing ferry service within the Bay (WETA 2009). These plans are described in Section 3.4 (Navigational Safety).

3.2.3 OTHER REGIONAL AND LOCAL PLANS AND POLICIES

There are over 50 local and regional entities that could potentially have jurisdiction over Water Trail access sites. Many of these agencies and special districts have prepared plans, policies, or regulations governing development and recreation in their respective jurisdictions. The local and regional plans, policies, and regulations applicable to each specific WT trailhead will be identified in the Site Descriptions developed as part of the trailhead designation process. Section 3.13 (Land Use and Planning) provides additional discussion of the types of local and regional plans and policies that may have some bearing on implementation of the Water Trail Plan.

3.3 RECREATION

This section identifies potential impacts on recreational resources that could result from implementation of the WT Plan. Recreation issues addressed in this section include boating and general recreation use levels at proposed WT launch and destination sites (Backbone Sites), potential changes in recreation use, potential conflicts among recreational users, and physical impacts to recreational facilities from program-related recreation development and use.

3.3.1 INITIAL STUDY FINDINGS

Two potential impacts to recreational resources are considered in the Initial Study checklist. Potentially significant impacts would occur if the project would:

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.
- Include recreation facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

Both impacts were identified as potentially significant in the Initial Study, and complete evaluation of these potential impacts to recreational resources is presented in this section. Navigational issues are addressed separately in Section 3.4, Navigational Safety. Similarly, secondary impacts of project-induced changes in recreational use that may affect land use, biological resources, water quality, public services, cultural resources, and aesthetics are addressed in those respective sections.

3.3.2 REGIONAL SETTING

Chapter 2 provides a detailed description of NMSB use and conditions in the Bay Area. San Francisco Bay, as the largest open space resource in the region, provides environments for all types of NMSBs and presents significant opportunities for dispersed use²³ and eco-recreation²⁴. As discussed in Chapter 2, natural variables that affect the levels and patterns of NMSB use include tides, currents, winds, and depth of water. These attributes combine to provide a highly variable mix of recreational boating settings in different locations. Wildlife habitats and the species they support can also affect patterns of NMSB use by serving as attractions and destinations. Other variables that affect NMSB use and use patterns are location of access points, safety exclusion zones, and other boating activities such as commercial shipping, water transit vessels, and motorized small boats.

Existing access onto the Bay for NMSBs consists of many more than the 112 Backbone Sites identified in the WT Plan. Many NMSBs, particularly canoes and kayaks, can be transported on a car top, can be carried for short distances, and can be launched from any location that has reasonable vehicular and pedestrian access near the bay shoreline. There are hundreds of informal sites where the physical terrain and shoreline conditions could theoretically be used for

²³ Dispersed Recreation: Recreation that does not occur in a developed recreation site.

²⁴ Eco-Recreation: Low-impact recreation where the natural and/or cultural resources are the major attraction; outdoor recreation opportunities dependent upon a diverse and undisturbed landscape setting; recreational opportunities and facilities using alternative, sustainable design (such as solar/wind power and composting toilets) so as not to impact the natural/cultural resources.

NMSB access to the Bay. The South Bay, San Pablo Bay and Suisun Marsh have fewer informal or formal access points than the Central Bay.

At formal launch sites, NMSB users frequently share access with other recreationists. Most commonly, launch sites used by NMSBs are also used by motorized boats. These launch sites may be located in urban parks or natural areas used for other recreational activities such as hiking, fishing, bicycling, wildlife viewing, swimming, sunning, picnicking, or play in organized playgrounds or open lawn areas. Levels of use at launch sites vary widely.

Numerous interest groups in the Bay Area have formed around, or offer, a variety of NMSB pursuits, share information, promote safety, and protect Bay resources. Table 3.3.2-1 provides a representative listing of these organizations. There are also numerous rowing clubs associated with high schools and colleges throughout the Bay Area that teach boating safety.

TABLE 3.3.2-1. NON-MOTORIZED BOATING GROUPS AND ORGANIZATIONS

Organization	Location	Description
Bay Access Inc. (http://www.bayaccess.org/)	Area-wide (web-based)	A nonprofit organization of kayakers dedicated to improving non-powered boat access and water trails
Bair Island Aquatic Center (http://www.gobair.org/)	Redwood City	A nonprofit organization focused on human-powered water sports such as rowing, sculling, paddling, and dragon boating
Bay Area Sea Kayakers (http://www.bask.org/)	San Francisco	Club dedicated to the safe enjoyment of the sport of sea kayaking
Berkeley Paddling and Rowing Club (http://www.berkeleyrowingclub.org/)	Berkeley	Local chapter of U.S. Canoe/Kayak organization
Benicia Outriggers	Benicia	Outrigger canoe club
California Dragon Boat Association (http://www.cdba.org/)	San Francisco	Nonprofit organization to foster the growth and development of dragon boating in the San Francisco Bay Area
Bay Area Whaleboat Rowing Association (http://www.bawra.org/)	San Francisco	Represents over 12 Rowing Clubs in the Bay Area
Dolphin Club (http://www.dolphinclub.org/)	San Francisco	Nonprofit, public-access athletic organization
DragonMax Dragon Boat Club of Berkeley (http://www.dragonmax.org/)	Berkeley	Outrigger canoe club
Embarcadero Rowing Club (http://www.rowrenegade.org/)	San Francisco	A non-profit organization for whaleboat rowing
Friends of the Napa River (http://www.friendsofthenapariver.org/)	Napa	Nonprofit organization dedicated to the protection and restoration of the Napa River; sponsors canoe and kayak trips
Friends of the Petaluma River (http://www.friendsofthepetalumariver.org/)	Petaluma	Nonprofit organization dedicated to celebrating and conserving the Petaluma River, its wetlands and wildlife
He'E Nalu o'Marin Outrigger Canoe Club (http://www.heenaluocc.org/)	Larkspur	Outrigger canoe club

TABLE 3.3.2-1. NON-MOTORIZED BOATING GROUPS AND ORGANIZATIONS

Organization	Location	Description
Ho'okahi Pu'uwa Outrigger Canoe Club (http://www.hpocc.com/)	Foster City	Outrigger canoe club
Hui Wa'a O San Jose Outrigger Canoe Club (http://www.kanuclub.org/)	Redwood City	Outrigger canoe club
Jack London Aquatic Center (http://www.jlac.org/)	Oakland	Organization that provides dragon boats, kayak, and rowing programs
Kaimanu Hawaiian Outrigger Canoe Club (http://www.kaimanu.com/)	San Leandro	Outrigger canoe club
Kamali'i 'O Ke Kai Outrigger Canoe Club (http://www.kamaliiokekai.org/)	San Jose	Outrigger canoe club
Kilohana Outrigger Canoe Club (http://www.kilohanaocc.org/)	Fremont	Outrigger canoe club
Lokahi Outrigger Canoe Club (http://www.lokahiocc.org/)	Petaluma	Outrigger canoe club
Marin Canoe and Kayak Club (http://www.marincanoecub.org/)	San Rafael	Encourages and supports boating
Marin Rowing Association (http://www.marinrowing.org/)	Greenbrae	A non-profit organization
North Bay Rowing Club (http://www.northbayrowing.org/)	Petaluma	Rowing club
Oakland Strokes (http://www.oaklandstrokes.org/)	Oakland	Rowing club for high school ages
O Kalani Outrigger Canoe Club	Alameda	Outrigger canoe club
Ohana Wa'a Outrigger Canoe Club	Petaluma	Outrigger canoe club
Open Water Rowing Center (http://www.owrc.com/)	Sausalito	A Limited Liability Corporation (LLC) for open water sculls whose partners are rowers and members of the OWRC
Pacific Rowing Club (http://www.pacificrowingclub.org/)	San Francisco	Sculling club
Petaluma Paddlers	Petaluma	Local canoe and sea kayak paddling group
Petaluma Small Craft Center Coalition (http://starbirdcreative.com/PSC3/)	Petaluma	Encourages and supports human-powered watercraft on the Petaluma River
Pu Pu O Hawai'i Outrigger Canoe Club (http://www.pupuohawaii.org/)	Los Gatos	Outrigger canoe club
San Francisco Bay Area Kiteboarding (http://www.bayareakiteboarding.com/)	Area-wide (web-based)	Website with information about kitesurfing
San Francisco Boardsailing Association (http://www.sfba.org/)	San Francisco	A non-profit organization that addresses concerns of boardsailing

TABLE 3.3.2-1. NON-MOTORIZED BOATING GROUPS AND ORGANIZATIONS

Organization	Location	Description
San Francisco Outrigger Canoe Center (http://www.sfocc.org/)	South San Francisco	Outrigger canoe organization
Save the Bay (http://www.savesfbay.org)	Oakland	Nonprofit organization working exclusively to protect, restore and celebrate San Francisco Bay; sponsors canoe and kayak outings on the Bay often associated with restoration programs
South End Rowing Club (http://www.south-end.org/)	South San Francisco	Local rowing club
Stanford Kayak Club (http://www.stanford.edu/group/KayakClub/)	Palo Alto	Local kayak club
Stanford Canoe and Kayak (http://www.stanford.edu/group/sck/)	Redwood Shores	Local chapter of U.S. Canoe/Kayak organization
Tamalpais Outrigger Canoe Club (http://www.geocities.com/paddletam/)	Sausalito	A non profit organization which provides instruction in basic and advanced techniques in the sport of outrigger canoeing
Wavechaser Paddle Series	Area-wide (web-based)	Winter racing organization for outrigger canoes and kayaks
Western Sea Kayakers (http://www.westernseakayakers.org/)	San Jose	Sea kayak club
Women on Water (http://www.uswindsurfing.org/WOW/WOWhome.htm)	San Francisco	Promotes women's windsurfing and kitesurfing

ROUTES OF TRAVEL

Recreational NMSB use on San Francisco Bay is typically a dispersed recreation activity (i.e., NMSB users may use any portion of the Bay); however, certain types of use may occur preferentially in certain areas (e.g., windsurfers have preferred areas depending on the wind conditions). While there are some localized restrictions regarding appropriate boating areas (e.g., as implemented by Marin Audubon Society for Richardson Bay²⁵), with the exception of established exclusion zones enforced by the U.S. Coast Guard (see Section 3.4), no regulatory agency or specific bay-wide program directs boaters where, or where not, to travel. Though general, there are selected recreational routes of travel and locations that are popular for non-powered small boat recreation, commercial eco-tourism, nature observation, and environmental education. Some of the more popular routes of travel are listed below. It should be noted, however, that the patterns of NMSB use vary significantly among the different boat types.

- From Crissy Field to Marin Headlands/Kirby Cove (camping permitted) and Sausalito
- From Horseshoe Cove to Angel Island (camping permitted)

²⁵ The Richardson Bay Audubon Center & Sanctuary waters are closed annually to boat traffic (including non-motorized boats) and in-water activities from October 1st through March 31st for the benefit of migratory waterfowl (Richardson Bay Regional Agency Ordinance 92-1). See http://www.tibronaudubon.org/conserve_boat.html for more detail.

- From Sausalito/Richardson Bay/San Francisco to Angel Island (camping permitted)
- From Gallinas Slough to China Camp, the Sisters Islands, and McNears Beach County Park
- Along the East Bay from Richmond to Emeryville shoreline
- Along the City of San Francisco shoreline
- Along the Oakland inner harbor shoreline
- From Jack London Square to Yerba Buena and Treasure Islands
- Around Alameda Island
- Around the Bair Island Ecological Reserve and Corkscrew Slough

In addition to specific routes of travel, there are also certain popular paddling areas in the project area. These include:

- China Camp Shoreline, Marin County
- Newark Slough, SF Bay National Wildlife Refuge
- San Leandro Bay, San Leandro
- Petaluma River and Petaluma Marsh, Lakeville
- Tolay Creek, Sonoma County
- Bull Island, Napa
- Arrowhead Marsh, Martin Luther King Regional Shoreline, Oakland
- Newark Slough, Newark
- Palo Alto Baylands, Palo Alto
- Bothin Marsh, Mill Valley
- Gallinas Creek, San Rafael
- Heron's Head Marsh, San Francisco

REGIONAL AND SITE-SPECIFIC GROWTH TRENDS

Understanding the potential growth patterns and changes in use that could be caused by implementation of the WT Plan is essential to evaluating the potential effects of the WT on recreation. As discussed in Chapter 2, growth in NMSB use could occur regionally or at the local site level, and would occur with or without the WT. While the Cal Boating Survey (Cal Boating 2009) includes considerable information on statewide non-motorized boating activity, and provides some regional information, no comprehensive NMSB use and trend data are kept for San Francisco Bay.

POTENTIAL REGIONAL GROWTH OF NMSB USE

As noted in Chapter 2, factors that drive regional non-motorized boating growth include population trends, overall participation trends in the various NMSB sports, and the population age profile. The Cal Boating survey (Cal Boating 2009) provides low, medium, and high estimates of the number of California households and participants that are expected to own non-motorized boats in the year 2010. For the purposes of this document, the Cal Boating medium estimate of 3.84% annualized growth of NMSB ownership and use is used as the growth rate absent the WT. While the regional increase in use associated specifically with

implementation of the WT cannot be quantified, as was explained in Section 2.2.2, it is likely that the effect will be quite small compared to the regional growth absent the WT. This is because most of the proposed Backbone Sites already exist and there is a relatively high barrier to entry for NMSB use. Publicity by itself is unlikely to lead to large increases in participation, and WT funding for facilities would be small relative to the total infrastructure investment at existing sites.

The 2009 Cal Boating survey assumes that, at a minimum, NMSB ownership rates (i.e., the percentage of households in the state that own NMSBs) would remain the same between 2006 and 2010, and that growth in NMSB use in this low-growth scenario would therefore be due only to growth in population. Locally, ABAG estimates that the regional population of the nine-county Bay Area will grow at an annualized rate of 0.7% between 2005 and 2010, and at an annualized rate of 0.8% long-term (between 2005 and 2035) (ABAG 2009). This growth rate would likely represent the minimum growth rate in NSMB use, absent any of the demographic trends which have contributed to, and are expected to continue to contribute to, growth in NMSB use.

Several demographic trends are expected to contribute to increases in NMSB use beyond that solely attributable to population growth. As described in the Cal Boating survey (Cal Boating 2009), the characteristics of boaters participating in the sport for less than five years suggest that the trend is toward higher participation by Asian, Black, or Latino Californians, possibly indicating that non-motorized boating is becoming more diverse and reflective of the population in the State. New boaters also tended to have less formal education, and have less household income, than the overall population of boaters. In addition, those boating less than five years had a greater proportion of young boaters (24 years or less) and boaters in the middle age groups (35 to 44 and 45 to 55). Both of these age groups are currently growing in size.

SITE-SPECIFIC GROWTH

Growth at the site-specific level is expected to be most influenced by improvements to facilities and services at a given site, although increases commensurate with population changes could also occur. While all facility enhancements would improve the quality of a NMSB user's experience at a site, some enhancements may draw additional users, whereas other enhancements would not be expected to have an effect on the number of users at a given location. Publicity may also have site-specific effects. If publicity materials promote certain sites or caution against the use of certain sites, usage patterns at those specific sites may change. A shift toward increased use could also be triggered by new knowledge about a site (if boaters did not know it existed, for example) or the creation of a site that did not previously exist.

Additions/enhancements of facilities or amenities such as additional or improved parking, provision of classes or tours, and new overnight accommodations could support site-specific growth. The conversion of a site that is not accessible to disabled persons to one that is would also be attractive to some people who could not previously use the site. Potential site enhancements are discussed in detail in Section 2.3.4. While most site enhancements are likely to contribute to some level of increased use, the following enhancements would not be expected to have any discernable effect on the number of users at a given site:

- New or improved signage

- Simple improvements to parking facilities, such as paving a gravel parking lot or adding striped parking spaces
- Improved restrooms, and
- Decorative landscaping

Although the WT program does not have a dedicated funding source, the Conservancy would lead efforts to find funding to implement the WT Plan, as mandated in the WT Act. Funding made available because of implementation of the WT Plan could increase the likelihood that certain facility improvements would be constructed and thus could lead to an increase in site-specific use. However, many of the facility improvements that could potentially be funded with WT-related grants might also eventually be constructed through other non-WT-related funding sources obtained by or originating with the site owners. Site owner interest in constructing improvements is likely to be driven more by owners' missions, advocacy by local non-motorized small boating enthusiasts, and increases in population than by the availability of WT-related funding. Further, the amount of WT-related funding that may be available over time is likely to remain small relative to the total non-WT-related investment in NMSB facilities throughout the nine-county Bay Area.

Promoting the creation of new access sites in areas that currently lack access could also contribute to site-specific growth. However, most new sites are likely to be created as a result of local agency initiatives and/or permit requirements (e.g., BCDC or local use permits), and would not be driven by the WT. Development of new locations would be supported by the WT, as appropriate, but would be dependent on the initiative of the potential site owner in creating the new access. Thus, the WT's role in promoting the creation of new access sites would be minor compared to other factors that may drive the creation of new sites.

The likely effect of any specific enhancement at a specific site would have to be assessed in the context of that site, as many factors (other enhancements, competition from nearby sites, seasonal restrictions, weather and tide patterns, and more) would influence the actual effect. In some cases, the number of site users may be constrained by multiple factors, and implementation of a single site enhancement would not be sufficient to eliminate restrictions on site use. For example, a site may lack parking and have limited launch space. If additional launch space is provided, but parking remains limited, the total number of users at the site may not change.

Finally, use of certain sites may also decrease. A shift toward decreased use of a site could be triggered by new knowledge about a site (for example, if seasonal avoidance of sensitive wildlife areas is recommended); the creation of a site that did not previously exist (drawing users to the new site if it is more desirable than one(s) previously used); or the addition/enhancement of facilities or amenities at other sites (drawing users to that site and away from other sites). Other factors unrelated to the WT may also affect site use, such as natural disasters or closure of a site by the site owner or manager.

TRENDS IN NMSB USE

Studies on NMSB use trends differ significantly in their quantitative conclusions, but tend to agree on conclusions about interest. The available studies on NMSB use in California point to an increase in use. According to a report released in 2003, between 1997 and 2002, the statewide

participation in paddlesports²⁶ increased from 18.3% to 23% (State Parks 2003). The randomized, statistically-designed survey regarding participation in NMSB use in California conducted by Cal Boating indicated that NMSB use grew at an annualized rate of 3.84% between 2002 and 2006 (Cal Boating, 2009). Based on the Cal Boating survey, approximately 8.25% of Californians participated in NMSB activities of all types in 2006 (Cal Boating, 2009).

KAYAKING

Of all the boating types targeted by the WT, kayaking has shown the most dramatic increase in popularity over the past few years. National kayak participation rates were first measured in 1994, when they were still quite low, at 1.3% of the national population (National Marine Manufacturers Association, *2005 Boating Statistical Abstract*). In the early 1990s, kayaking was considered a specialty sport, requiring some training and a relatively high level of skill for either of the sport's two main subsets: whitewater kayaking or sea kayaking. More recently, the advent of the recreation/sit-on-top kayaks has changed kayaking use levels. Recreational kayaks are relatively inexpensive, easy to operate, and appropriate for entry-level NMSB users. When rented, sit-on-top kayaks do not require a safety training session, which also adds to their popularity.

By 2005, national kayak participation had increased to about 4.0% (Outdoor Industry Foundation, *Outdoor Recreation Participation Study – Eighth Edition for the Year 2005*, June 2006). Participation nationwide in non-whitewater kayaking increased significantly (+26.3%) between 2003 and 2005. That increase was largely due to recreation/sit-on-top kayaking (+34.4%), with touring/sea kayaking as an outdoor recreation participation decreasing (-4.7%) during the same period.

CANOEING

Canoeing is the most traditional NMSB activity in the nation, and has been tracked for the longest period of time. Recently, nation-wide canoeing participation rates have slightly declined. There are several sources of data on canoe participation and demographics, although some combine canoeing with kayaking, or other paddle sports. These include (see Appendix F in Cal Boating 2009):

- U.S. Forest Service, National Survey on Recreation and the Environment
- American Recreation Coalition, The Recreation Roundtable Survey
- Outdoor Industry Foundation, Outdoor Recreation Participation Study, and
- American Sports Data, Superstudy of Sports Participation

Based on the Cal Boating survey, 10.5% of all NMSB use in California consists of canoes. Participation nationwide in canoeing increased 8.5% between 1998 and 2005 but decreased by 8.7% between 2003 and 2005, indicating that the peak of popularity occurred between 1998 and 2005. The data indicate that the popularity of canoeing peaked in 2001 when a record number of Americans not only participated in canoeing but also participated much more frequently. However, the total number of outings has significantly declined since 2001. In 2005 there were

²⁶ The term "paddlesports" involves many types of boats and is a general classification also applied to river and lake recreation, and whitewater rafting. NMSB use on the Bay is a much more limited activity.

83 million outings taken compared to 192 million outings in 2001. National canoe sales reflect this trend. Since 1999, the general slow decline in national canoe participation and more rapid decline in national canoe sales are in contrast to the rapid rise of recreational kayaking.

WINDSURFING AND KITESURFING

Windsurfing is a sport whose popularity peaked in the 1980s and early 1990s, and has since declined in popularity (Cal Boating 2009). Because of the demanding physical requirements of the activity, participation rates represent a relatively low percentage of the population even though windsurfing participation rates in California appear to be slightly higher than national rates. The 2005 national participation rate for windsurfing ranged between 0.2 percent and 1.1 percent; the Cal Boating survey indicates that in 2006, 1.2% of NMSB use consisted of sailboards, including kitesurfers. Sailboard sales peaked between 1980 and 1990, when sales were at 42,000 units. The highest year on record was 1987, at 70,000 units. Sales have declined in each of the years since.

ROWING

In participation studies there is no standard definition of rowing, so the category could include sculls and shells, rowboats, dinghies, tenders, dories, driftboats, dragon boats, and rowing boats that are sometimes used with a motor. Row boats of all types represent approximately 8% of NMSB use in California. National rowing participation rates have essentially been the same since 1994 when records were first measured (Cal Boating 2009).

TEAM BOATING

The popularity of group-rowing activities such as in dragon boats, outrigger canoes, sculls, and whale boats is increasing. However, the aggregate of these users is a small fraction compared to other boating types. In the Cal Boating survey, teamboating is included with “other” boating, which comprises a total of 1.7% of NMSB use in California (Cal Boating 2009).

3.3.3 LOCAL SETTING

Existing formal launch sites vary significantly in terms of the level of development and management that supports NMSB activities. Sites may be located in waterfront parks, marinas and harbors, sites with public launch ramps or floats, public access areas, wildlife refuges and privately owned sites. The Bay Trail currently leads to or is near (within 1,000 feet) 72 of the 112 WT Backbone Sites (See Table 3.3.3-1).

3.3.4 REGULATORY SETTING

FEDERAL REGULATIONS

AMERICANS WITH DISABILITIES ACT (ADA)

The ADA mandates that individuals with disabilities be given an equal opportunity to access public facilities and that reasonable accommodations must be made to account for physical and mental limitations of individuals with disabilities. Compliance with ADAAG and pending ADA-ABA Accessibility Guidelines for recreational boating facilities would be required if new or improved facilities would be constructed at a site; there is no requirement to “retrofit” existing facilities if no facility modifications are being conducted. Compliance with accessibility

TABLE 3.3.3-1. WT BACKBONE SITES ADJACENT TO EXISTING BAY TRAIL SPINE

Site Map Key²⁷	Site Name	Existing or Planned Site	Launch or Destination Site	Bay Trail at or near Site
Alameda County				
A1	Albany Beach	Existing	Launch	Yes
A2	Berkeley Marina, Ramp	Existing	Launch	Yes
A4	Point Emery	Existing	Launch	Yes
A5	Shorebird Park	Existing	Launch	Yes
A6	Emeryville City Marina	Existing	Launch	Yes
A8	Middle Harbor Park	Existing	Launch	Yes
A9	Jack London Square	Existing	Launch	Yes
A11	Estuary Park/Jack London Aquatic Center	Existing	Launch	Yes
A12	Grand Avenue Boat Ramp	Existing	Launch	Yes
A14	Robert Crown Memorial State Beach	Existing	Launch	Yes
A15	Encinal Launching and Fishing Facility	Existing	Launch	Yes
A18	Doolittle Drive; Airport Channel	Existing	Launch	Yes
A20	San Leandro Marina	Existing	Launch	Yes
A22	Eden Landing Ecological Reserve	Planned	Launch	Yes
A24	Jarvis Landing	Existing	Launch	Yes
A25	Tidewater Boathouse	Planned	Launch	Yes
A26	Berkeley Marina, Small Boat Launch	Existing	Launch	Yes
A27	Coyote Hills	Planned	Destination	Yes
A28	Elmhurst Creek	Existing	Launch	Yes
A30	Hayward's Landing	Planned	Destination	Yes
Contra Costa County				
CC1	Martinez Marina	Existing	Launch	
CC2	Carquinez Strait Reg. Shoreline (Eckley Pier)	Existing	Launch	Yes
CC5	Rodeo Marina	Planned	Launch	
CC6	Pinole Bay Front Park	Existing	Launch	Yes
CC8	Point Molate Beach Park	Planned	Launch	
CC9	Keller Beach	Existing	Destination	Yes
CC10	Ferry Point	Existing	Launch	Yes
CC11	Boat Ramp Street Launch Area	Existing	Launch	Yes
CC14	Richmond Municipal Marina	Existing	Launch	Yes
CC15	Marina Bay Park & Rosie the Riveter Memorial	Existing	Launch	Yes

²⁷ Site locations are shown on 2.1.4-1A and 2.1.4-1B

TABLE 3.3.3-1. WT BACKBONE SITES ADJACENT TO EXISTING BAY TRAIL SPINE

Site Map Key²⁷	Site Name	Existing or Planned Site	Launch or Destination Site	Bay Trail at or near Site
CC16	Shimada Friendship Park	Existing	Launch	Yes
CC17	Barbara & Jay Vincent Park	Existing	Launch	Yes
CC19	Point Isabel Regional Shoreline	Existing	Launch	Yes
CC20	SS Red Oak Victory	Planned	Destination	
CC21	Point Pinole	Planned	Destination	Yes
CC22	Bay Point Regional Shoreline	Planned	Launch	
CC23	Rodeo Beach	Planned	Launch	
Marin County				
M1	Kirby Cove	Existing	Destination	
M2	Horseshoe Cove	Existing	Launch	
M3	Swede's Beach	Existing	Destination	
M4	Turney Street Public Boat Ramp	Existing	Launch	
M5	Dunphy Park	Existing	Launch	
M6	Schoonmaker Point	Existing	Launch	
M8	Clipper Yacht Harbor	Existing	Launch	
M10	Shelter Point Business Park	Existing	Launch	Yes
M11	Bayfront Park	Existing	Launch	Yes
M13	Brickyard Park	Existing	Launch	
M16	Richardson Bay Park/ Blackies Pasture	Existing	Launch	Yes
M17	Angel Island State Park	Existing	Destination	
M19	Sam's Anchor Café	Existing	Destination	
M25	Higgins Dock	Planned	Launch	
M27	Bon Aire Landing	Existing	Launch	
M28	Marin Rowing Association Boathouse	Existing	Launch	Yes
M29	Ramillard Park	Existing	Launch	Yes
M30	San Quentin	Existing	Launch	
M31	Jean & John Starkweather Shoreline Park	Existing	Launch	Yes
M33	Harbor 15 Restaurant	Existing	Destination	
M35	Loch Lomond Marina: Ramp	Existing	Launch	
M36	Loch Lomond Marina: Beach	Existing	Launch	
M38	McNear's Beach	Existing	Launch	
M39	China Camp State Park	Existing	Launch	Yes
M40	Bull Head Flat	Existing	Launch	Yes

TABLE 3.3.3-1. WT BACKBONE SITES ADJACENT TO EXISTING BAY TRAIL SPINE

Site Map Key²⁷	Site Name	Existing or Planned Site	Launch or Destination Site	Bay Trail at or near Site
M41	Buck's Landing	Existing	Launch	
M43	John F. McInnis Park	Existing	Launch	Yes
M47	Black Point Boat Launch	Existing	Launch	
Napa County				
N1	Cutting's Wharf	Existing	Launch	Yes
N2	JFK Memorial Park	Existing	Launch	Yes
N6	Napa Valley Marina	Existing	Launch	
N7	Green Island Boat Launch Ramp	Planned	Launch	
N8	Riverside Drive Launch Ramp	Existing	Launch	
Santa Clara County				
SC2	Alviso Marina	Planned	Launch	Yes
SC3	Palo Alto Baylands Launching Dock	Existing	Launch	Yes
San Francisco County				
SF1	Candlestick Point State Recreation Area	Existing	Launch	Yes
SF2	India Basin Shoreline Park	Existing	Launch	Yes
SF4	Islais Creek	Existing	Launch	Yes
SF6	"The ""Ramp"""	Existing	Destination	Yes
SF7	Pier 52 Boat Launch	Existing	Launch	Yes
SF8	South Beach Harbor (AKA Pier 40)	Existing	Launch	Yes
SF9	Treasure Island	Existing	Launch	
SF10	Aquatic Park	Existing	Launch	Yes
SF11	Gas House Cove (aka Marina Green)	Existing	Launch	Yes
SF12	Crissy Field	Existing	Launch	Yes
SF13	Brannan St Wharf	Planned	Launch	Yes
SF14	Northeast Wharf Park	Planned	Launch	Yes
San Mateo County				
SM2	Ravenswood Open Space Preserve	Existing	Launch	Yes
SM4	Redwood City Municipal Marina	Existing	Launch	Yes
SM6	Docktown Marina	Existing	Launch	
SM9	Redwood Shores Lagoon	Existing	Launch	
SM11	Beaches on the Bay	Existing	Launch	Yes
SM12	Foster City Lagoon Boat Park	Existing	Launch	
SM13	East 3rd Ave	Existing	Launch	Yes

TABLE 3.3.3-1. WT BACKBONE SITES ADJACENT TO EXISTING BAY TRAIL SPINE

Site Map Key²⁷	Site Name	Existing or Planned Site	Launch or Destination Site	Bay Trail at or near Site
SM16	Seal Point Park	Existing	Launch	Yes
SM17	Coyote Point, Marina	Existing	Launch	Yes
SM18	Old Bayshore Highway	Existing	Launch	Yes
SM20	Colma Creek/Genentech	Existing	Launch	Yes
SM21	Oyster Point Marina	Existing	Launch	Yes
SM22	Brisbane Marina	Existing	Launch	Yes
SM23	Coyote Point, Beach	Existing	Launch	
SM24	Westpoint Marina	Planned	Launch	Yes
SM25	Corkscrew Slough Viewing Platform	Planned	Destination	
Solano County				
So1	Brinkman's Marina	Existing	Launch	Yes
So2	California Maritime Academy	Existing	Launch	Yes
So5	Belden's Landing	Existing	Launch	
So7	Matthew Turner Park	Existing	Launch	Yes
So8	West 9th Street Launching Facility	Existing	Launch	Yes
So9	Benicia Point Pier	Existing	Launch	Yes
So10	Benicia Marina	Existing	Launch	Yes
So12	Suisun City Marina	Existing	Launch	
Sonoma County				
Sn3	Hudeman Slough	Existing	Launch	
Sn5	Papa's Taverna/ Lakeville Marina	Existing	Launch	
Sn6	Petaluma Marina	Existing	Launch	
Sn7	Petaluma River Turning Basin	Existing	Launch	

guidelines would be addressed at the site-specific level (during development of the Trailhead Plan) for those sites where new or improved facilities are proposed.

NATIONAL PARK SERVICE

The National Park Service (NPS) has jurisdiction over three bayfront National Parks, including the Golden Gate National Recreation Area, San Francisco Maritime National Historic Park, and the Rosie the Riveter Historic Park. A key mission of the NPS is to identify, protect and preserve geological, biological, and cultural resources for future generations. Any changes that are contemplated to improve proposed Backbone Sites on NPS lands would require the approval by NPS specialists for these parks. Recreation policies for these parks are discussed in more detail in Section 3.13, Land Use Planning.

U.S. FISH AND WILDLIFE SERVICE

The National Wildlife Refuge System Improvement Act of 1997 designates wildlife-dependent recreational uses involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation as “priority general public uses.” When these activities are compatible with species protection goals (as determined by USFWS), they are welcome on refuges and receive priority over other uses. USFWS recreation policies for Bay refuges are discussed in more detail in Section 3.13, Land Use Planning.

STATE AND REGIONAL REGULATIONS

SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION, BAY PLAN

The design and implementation of all WT improvements will be within BCDC jurisdiction and most are expected to require a BCDC permit. Specific guidelines developed by BCDC for public access improvements along the Bay shoreline are summarized in *Shoreline Spaces: Public Access Design Guidelines for the San Francisco Bay* (2005). Guidelines are provided for a full range of specific public access improvements, including parking and staging areas and boat launching ramps. *The Bay Plan* and these guidelines are applicable to proposed WT-related improvements at WT Backbone Sites.

REGIONAL AND LOCAL NON-REGULATORY PLANS

ASSOCIATION OF BAY AREA GOVERNMENTS (ABAG) – BAY TRAIL PLAN

There are many local, non-regulatory plans of relevance to the Water Trail. Those plans will be reviewed during the site-specific analysis of the trailhead designation process. The Bay Trail Plan is regional and although non-regulatory, is described here because of its importance to the evaluation of potential recreational impacts on a regional level.

To date, approximately 300 miles of the alignment, over half the Bay Trail’s ultimate length, have been completed. Bay Trail policies and design guidelines are intended to complement rather than supplant the adopted regulations and guidelines of local managing agencies.

Bay Trail alignment policies reflect the goals of the Bay Trail program—to develop a continuous trail which highlights the wide variety of recreational and interpretive experiences offered by the diverse bay environment and is situated as close as feasible to the shoreline, within the constraints defined by other policies of the Bay Trail Plan. Bay Trail policies also include the investigation of water trails as an enhancement to the shoreline trail system. Depending on the location of its segments, the Bay Trail consists of paved multi-use paths, dirt trails, bike lanes, sidewalks or city streets signed as bike routes.

3.3.5 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The Proposed Project would be considered to have a significant impact to recreation resources if:

- Construction or expansion of recreational facilities may have an adverse physical effect on the environment. This criterion is addressed in the other sections of this EIR, as well as the Initial Study (see Appendix B).

- There is a substantial increase in the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.
- The location, design or use of proposed WT Backbone Sites would preclude existing recreation activities.

METHODOLOGY

Potentially significant impacts identified in the Initial Study were evaluated for their impact after implementation of the WT, including the strategies defined in the WT Plan. Potential impacts to recreational resources were evaluated based on a literature review, interviews with boating organizations and establishments providing boating services, and professional judgment. For each impact area, the recreation impact analysis discusses the WT strategies that would minimize potential impacts where applicable and identifies additional program strategies or strategy refinements for mitigation if needed. Applicable WT strategies (See Appendix B) are referenced and summarized as appropriate.

REGIONAL IMPACTS AND MITIGATION MEASURES

IMPACT REC-1: REGIONAL EFFECTS ON RECREATION

Potential impacts of the WT related to recreation resources generally would be site specific and not regional. At many locations, existing recreation resources would overlap or co-exist with the WT. For example, regional agencies such as East Bay Regional Park District have local and regional trails and other recreational facilities that may also include WT sites. Implementation of the WT Plan would provide multi-faceted opportunities at existing recreational sites such as waterfront parks. The WT would add a new layer of recreational opportunities for residents and visitors. Implementation of the WT Plan would typically complement the San Francisco Bay Trail program by providing for a full range of non-motorized recreation opportunities at the numerous locations where the Bay Trail and WT would overlap. The WT could support existing outreach efforts conducted by other agencies providing recreational opportunities by including them in WT promotional materials.

A possible concern posed by implementation of the WT Plan is the potential for more users at existing high use sites/areas. This impact would be site-specific and is addressed by Impact Rec-4. However, implementation of the WT Plan is likely to enhance the existing recreational opportunities and experiences of local residents and visitors. Therefore, the WT's effect on recreational resources would be generally a positive one and is considered **less than significant**.

SITE-SPECIFIC IMPACTS AND MITIGATION MEASURES

IMPACT REC-2: INCREASED USE OF EXISTING SITES OR OTHER RECREATIONAL SITES CAUSING ACCELERATED PHYSICAL DETERIORATION OF THE FACILITY OR SUBSTANTIAL UNPLANNED EXPANSION

As described in Chapter 2, NMSB use in the Bay Area is expected to increase due to population growth, other demographic factors, and possibly specific activities of the WT. As discussed earlier, potential growth associated solely with the implementation of the WT Plan is expected to be only a small percentage of the overall (population-driven) growth.

Increased use of existing facilities that become WT trailheads could lead to an incrementally accelerated increase of wear and tear on facilities. However, NMSB users represent a small percentage of overall shoreline use. WT facilities could be anticipated to have a normal life-span that would be experienced by any other public shoreline facility.

The WT Plan specifically anticipates and addresses these types of concerns, and implementation of Strategies 6 (Management Resources) and 7 (Operations and Maintenance) during the trailhead designation process²⁸ would ensure that sufficient budget and an effective plan for maintenance are in place at all WT sites. Use of these strategies would ensure that the WT Plan is implemented consistent with local agency level-of-service standards and available resources to manage and operate sites.

The trailhead designation process would include an assessment of the likelihood of increased use, and potential impacts to facilities. Based on anticipated changes in overall use levels and the ability of the WT Plan strategies to direct and manage use, this potential impact is considered **less than significant** and no mitigation is required.

IMPACT REC-3: INCREASED USE OF WT SITES BY MOTORIZED BOATS FROM IMPLEMENTATION OF THE WT PROGRAM

A secondary non-quantifiable impact of implementation of the WT is that it may stimulate use of WT trailheads by motor boats, or unauthorized motor boat use of NMSB-only WT launch and destination sites. Most commonly, potential WT launch sites are already also used by motorized boats. However, the designation of WT sites and the potential for multi-day itineraries could induce motorized boats to make similar trips and use WT launch sites, including those only intended for non-motorized watercraft. WT education and outreach strategies, including signage, (Strategies 17, 18, 19, 20, 21, and 22) would serve to mitigate these potential impacts. Additionally, the detailed design of NMSB-only launch sites in the Trailhead Plan, consistent with Strategy 3, could essentially preclude most motorized boats from using them if a shallow draft depth were incorporated into the design. Strategy 7 would address potential site management issues, and maintenance and operations plans could include monitoring appropriate use of facilities by the designated user groups. This potential impact is considered **less than significant** and no mitigation is required.

IMPACT REC-4: CONFLICT WITH, AND PRECLUSION OF, EXISTING RECREATION ACTIVITIES DUE TO FACILITY IMPROVEMENTS, INCREASED USE OF WT SITES, OR INCREASED BOATING

Existing access onto the Bay for NMSBs consists of more than 135 launch and landing sites. In most cases, the 112 WT Backbone Sites are multi-use areas and, as such, require various types of recreation users to functionally co-exist in order for the site to operate smoothly. However, conflicts between recreation uses can and do occur. The potential for the WT designation to preclude existing recreation from taking place could result from the following: where access plans for facilities would displace or exceed the capacity of existing facilities, or where increased use related to the WT could create sufficient conflicts among recreation users of any type such that some existing users do not return. Conflicts between WT users and other existing recreation activities could occur both on the shoreline and in the water. Conflicts could be created by:

²⁸ See Chapter 2 for a detailed discussion of how the strategies would be implemented.

- Poor site planning (for example, placing WT access routes, boat ramps, or rigging areas in direct conflict with other recreation activities, such as the use along the Bay Trail)
- Competition for limited parking at some locations
- Use of WT access facilities by motorized boats, and
- On-water capacity conflicts among all types of boating at popular public launch ramps where ramp and dock space are scarce or in narrow waterways where maneuvering options are limited.

Potential navigational conflicts between motorized and non-motorized small boats are addressed in Section 3.4.

Potential use conflicts can be characterized into five scenarios. Scenario 1 consists of increased use at existing sites, including HOSs. Here existing use levels and any associated use-conflicts at sites can be assumed to be part of the baseline condition. However, some of these sites may be experiencing significant use and management challenges where any additional recognition may only serve to exacerbate problems for management. For example, access and parking at Crissy Field and Kirby Cove are often at capacity and additional use frustrates both park visitors and management (personal communications: Steve Ortega and Mia Monroe, NPS, January 7, 2008). If a facility becomes overcrowded, NMSB users could also shift their use to other recreation sites and informal sites, potentially putting stress on the facilities at those sites.

Scenario 2 consists of existing, developed sites that may be enhanced to introduce features that, if not sensitively planned and designed, could conflict with existing use patterns. For example, the Bay Trail currently passes between the rigging area at the East 3rd Avenue site in Foster City (Site SM13) and the two launch areas. This site is popularly used by windsurfers and kiteboarders

Scenario 3 would involve substantial new improvements and would be introducing NMSB launching activities to areas or sites where they do not now exist. As each site is unique, site-specific use impacts and appropriate mitigation cannot be assessed at a program level, and would be addressed in the development of the Trailhead Plan and in project-level CEQA review if and when expansions of existing facilities or construction of new sites are proposed.

Scenario 4 would consist of new or increased use of WT sites by motorized boats. The proposed WT Plan is intended to increase visibility of boating opportunities on the Bay and adjoining waterways. Many WT sites are designed for both motorized boats and NMSBs; however, some access sites are used only or primarily by NMSBs. If WT publicity makes motorized boat users aware of and use sites that were formerly only or primarily used by NMSBs, conflicts could ensue between NMSBs and motorized boats.

Scenario 5 would consist of increased on-water conflicts, primarily due to increased NMSB use of areas currently open to hunting. State Wildlife Areas and portions of the National Wildlife Refuges in San Francisco Bay permit hunting during certain times of year. Increased use of these areas by NMSB users could adversely affect hunting conditions and could also expose NMSB users to personal danger.

Some amount of increased use of existing Backbone Sites is inherent in the WT Plan in that the WT Plan is both an improvement program and a management plan. Trailhead locations and improvements would be implemented and managed in accordance with WT Plan Strategies 1, 3, and 24 (see Table 2.3.3-1 and Appendix D); implementation of these strategies would direct both the levels of WT use and the patterns of use that may be encouraged by the WT Plan. Strategies 17, 18, 19, 20, and 21 (see Table 2.3.3-1 and Appendix D) govern how the boating public is made aware of trailhead locations and destination opportunities and would help control NMSB use of the various access sites.

As described in Chapter 2, the trailhead designation process for all potential WT sites requires development of a Site Description. For sites requiring more than signage to be designated as a trailhead, a Trailhead Plan is also required. The Site Description includes a description of user groups, site management, and potential user conflicts.

The Trailhead Plan is site-specific and would apply the guidance contained in the WT Strategies in a practical, explicit way, as appropriate to the uses and features of the site that are WT-specific. Potential user conflicts would be addressed by integrating the requirements of the following strategies into the Trailhead Plan:

- Strategy 3 – The type and design of trail-related improvements should match site characteristics, including existing facilities and uses.
- Strategy 4 – Trailhead development should be consistent with existing policies, plans and priorities of land and resources managers at and around trailheads. If such plans include other facilities and uses, then the WT Trailhead Plan would need to accommodate those facilities and uses.
- Strategy 6 – Management resources should match the planned use of the site, and may include enforcement. This would help control inappropriate uses and resolve user conflicts.
- Strategy 14 – Periodic site reviews should be conducted to identify trail-specific problems, including user conflicts.
- Strategy 22 –Trailhead Stewards could assist in resolving use conflicts.
- Strategy 24 – Limitations on trailhead use may be appropriate; parking restrictions could be used to potentially limit use at trailheads and thereby avoid user conflicts.

The presence of the general public who would use WT sites provides a level of observation not typically provided by a managing agency, unless there is a full-time staff member assigned to a particular site. WT Strategies 17, 18, and 19 (see Table 2.3.3-1 and Appendix D) address a variety of means to inform the public about the WT, but do not provide a channel for the public to inform the Project Management Team about their opinions of the WT and its use. In addition, the potential conflict between hunting and NMSB use is not explicitly addressed in the strategies. Therefore, for sites where existing use levels are at capacity, and/or where NMSB users may more frequently enter areas currently open to hunting, implementation of the WT Plan could result in a **potentially significant but mitigable** impact.

MITIGATION MEASURE REC-M4A: WEB-BASED COMMENT FORM

Strategy 14 shall be modified to provide a web-based comment form for users to document use observations and conflicts. The web page address for this form shall be posted on applicable education/outreach materials.

MITIGATION MEASURE REC-M4B: CONDUCT RECREATIONAL USE EVALUATIONS AND DEVELOP/IMPLEMENT ADAPTIVE MANAGEMENT RECOMMENDATIONS IF USER CONFLICTS OCCUR

Based on the requirements contained in the Trailhead Plan and/or the professional judgment of the site owner/manager, and consistent with WT Plan Strategies 6, 14, and 22, when presented with information about use conflicts, the site owner/manager and/or volunteers shall evaluate the information presented, and monitor recreation use for a reasonable period, if appropriate. The evaluation and any monitoring conducted shall be used to determine if additional physical or management measures are necessary to alleviate use conflicts. Any such measures shall be incorporated into the periodic Site Review provided by Strategy 14 and a plan for implementing the appropriate measures shall be developed collaboratively by the site owner/manager and WT staff.

MITIGATION MEASURE REC-M4C: SAFETY SIGNAGE

Signage at trailhead locations within four miles of areas currently open to hunting shall include language that alerts NMSB users to the specific areas open to hunting (including dates) to enable NMSB users to avoid these areas during the hunting season.

3.4 NAVIGATIONAL SAFETY

Navigational and on-water safety issues relating to WT users are addressed in this section.

3.4.1 INITIAL STUDY FINDINGS

Navigation and navigational safety are not issues that are specifically included in the CEQA Initial Study (IS) checklist. However, the IS did identify a potential need for increased emergency response services associated with implementation of the WT. The potential need for increased emergency response capability would, in part, be due to potential accidents on the water.

This section of the EIR evaluates the potential navigational safety impacts associated with implementation of the WT. Potential impacts to public services are addressed in Section 3.5.

3.4.2 REGIONAL SETTING

The 548-square-mile San Francisco Bay has an irregular 1,000-mile shoreline composed of a variety of urban and suburban areas, marshes, and salt ponds.

NAVIGATIONAL RISKS FOR NMSBs

There are significant risks associated with NMSB use on San Francisco Bay.

Navigational risks for NMSBs and boating in general can be divided into six categories:

- Tides and currents;
- Inclement weather and fog, particularly winds
- Shallow water (mudflats, shoals and islands)
- Recreational motorized boating traffic
- Commercial vessel traffic, including ferries and vessels at anchorages
- Structures (including bridges)
- Bridge construction
- Dredging operations
- Debris (sunken vessels and other debris located in areas that may be accessed by NMSBs)

The combination of tides, currents, weather (fog and wind), and water depths presents an endless array of conditions challenging the safety and navigation skills of NMSB users. Even a skilled boater who is familiar with Bay conditions can get into trouble and require emergency services from either the Coast Guard or from land-based emergency response providers.

Navigating the Bay becomes more difficult during periods of restricted visibility due to winter storms and fog. Shorelines and obstacles (including other vessels, shallow waters, and structures) as well as changes in the water surface that could indicate dangerous conditions are more difficult to discern in storms and fog. The risks of accidents or becoming disoriented increase. Changes in the tide can result in NMSBs being swept off course away from shore and/or farther out into open waters, and can make landings difficult for the unaware (i.e., at launch sites or destination sites that are only accessible at certain water depths). Although in general NMSBs are able to maneuver in much shallower water than most other vessels, users could still become stranded by mudflats or low water areas at low tide. Sudden changes in weather can also result in

increased fatigue (e.g., as boaters are battling strong winds and/or waves) and medical emergencies such as hypothermia.

The inherent challenges for NMSB navigation in San Francisco Bay are exacerbated by the large number of vessels that are used on the Bay. As discussed in Section 2.2.2, based on the available information, the number of motorized (registered) boats and NMSBs that may be used on San Francisco Bay are generally in the same range.²⁹

The potential for collisions between NMSBs and other boats – particularly where scale and speed differences are significant, such as with commercial vessels and ferries – raises concerns for public safety. This concern is much greater where NMSB launches are in close proximity to commercial and ferry vessel terminals or where NMSBs may enter into a designated shipping or ferry route. According to the Harbor Safety Plan, thousands of recreational boats are concentrated near the major inbound and outbound Bay shipping lanes (HSC 2009). NMSB users could also encounter construction activities in the Bay. There are numerous crane barges and construction boats moving in and around the Bay Bridge, for example. Dredging operations occur throughout the Bay, and there are many on-going dredging operations that occur in small channels leading to private marinas. Anchorages could also be a place where increased risk of collision exists between larger vessels and NMSBs, such as at the two main anchorages in South San Francisco Bay (Anchorage 8 and 9); other anchorages are located in the Central and North Bays. The movements of vessels proceeding to anchorages are governed by wind, current, and sometimes spacing requirements, and will be unpredictable to NMSB users (T. Boone, USCG, pers. comm., April 23, 2010). Some of the potential WT sites, particularly in the Central Bay from southern Marin and Contra Costa Counties south to Redwood City and San Leandro, are located in such areas or near airports, ferry terminals, and exclusion zones. These areas present additional potentially dangerous situations for NMSB users. Although boating regulations (see Section 3.3.4, below) apply to all boaters and are designed to prevent collisions, not all NMSB users are sufficiently familiar with these regulations.

Existing structures may pose a collision hazard. In general, NMSB users would be expected to be aware of existing structures, and know to avoid them; however, collisions could occur as a result of extreme weather and tide conditions, or when trying to avoid a collision with another vessel. Finally, underwater or partially sunken debris exists in some areas of the Bay, such as Contra Costa County, where parts of shorelines are degraded by abandoned recreational and commercial vessels, dilapidated docks, old pilings, buildings, and junk (CCC 2008). Recently, during the economic downturn, there has been a significant increase in the number of vessels that are abandoned each year (CCC 2008). Debris located in shallow waters could damage a NMSB, cause groundings in deeper water, and result in injuries to NMSB users as a result of collisions and capsizings. Much of this debris also contains hazardous materials, or may spill untreated sewage, leading to potential health impacts due to poor water quality.

²⁹ The estimated number of NMSBs that could be used on San Francisco Bay (i.e., excluding inflatables) in 2006 was 174, 017. The estimated number of motorized recreational boats was 158,223 in 2000, with approximate annual growth of 1.4% to 2.5% per year. This range of growth rates would lead to an estimated 172,000 – 183,500 motorized boats in San Francisco Bay by 2006.

NMSB ACCIDENTS

Navigational accidents and loss of life related to NMSB use do occur. Tables 3.4.2-1 through 3.4.2-3 present boating accident and fatality statistics for selected NMSB use in California.

TABLE 3.4.2-1. USCG NATIONAL FATALITY DATA FOR CANOES AND KAYAKS -- 2005

Fatalities	Canoes	Kayaks
Drownings	40	24
With PFD	3	14
Without PFD	37	10
Percent without PFD	93%	42%
Other deaths	9	5
Total	49	29

Source: Cal Boating 2009

TABLE 3.4.2-2. TYPES OF NON-MOTORIZED BOATING ACCIDENT IN CALIFORNIA (1995 TO 2006)

Type of Reported Accident	Number of Reported Accidents
Capsizing	114
Collision with vessel	59
Falls overboard	23
Collision with fixed object	8
Flooding/swamping	8
Fall in boat	8
Struck submerged object	7
Struck by motor/propeller	3
Collision with floating object	1
Fire/explosion	1
Other/unknown	10
Total	242

Source: Cal Boating 2009

TABLE 3.4-3. NUMBER OF NON-MOTORIZED BOATING DEATH AND INJURY ACCIDENTS BY VESSEL TYPE IN CALIFORNIA (1995 TO 2006)

Vessel Type	Number of Deaths	Number of Injuries
Canoe/kayak	47	69
Raft	32	35
Rowboat	9	14
Sailboard	3	10
Kiteboard	1	1
Small sailboard	1	1
Paddle boat	1	5
Amphibious Tricycle	1	0
Inflatable dinghy	0	1
Rowing scull	0	3
Total	95	139

Source: Cal Boating 2009

As described in the 2009 Cal Boating report, NMSB accidents typically fall into three categories:

1. Relatively inexperienced users on flat water without personal flotation devices (PFDs), often fishing
2. Relatively inexperienced rafters, often without PFDs, in conditions beyond their experience levels, and
3. Highly experienced and well-outfitted paddlers, typically kayakers with PFDs, attempting to paddle extreme and challenging conditions (e.g., white water kayaking)

While reporting of accidents is required (as described in the regulatory setting section), both the USCG and Cal Boating believe that non-fatal accidents are greatly under-reported (Cal Boating 2009). While many sailboats and motor boats are on the Bay, particularly on weekends, few near-misses or accidents are reported to the USCG or VTS. A number of reported and unreported “near misses” occur which might be prevented by small boats properly yielding the right-of-way to large vessels that cannot change course (HSC 2009). No accidents or near-accidents involving board sailors and vessels have been reported to the USCG or Vessel Transit Service (VTS) during the past several years. However, many board sailors cross in front of tankers and container ships off Crissy Field, which is close to the Golden Gate Bridge. Competitive races are sponsored at this location during the year.

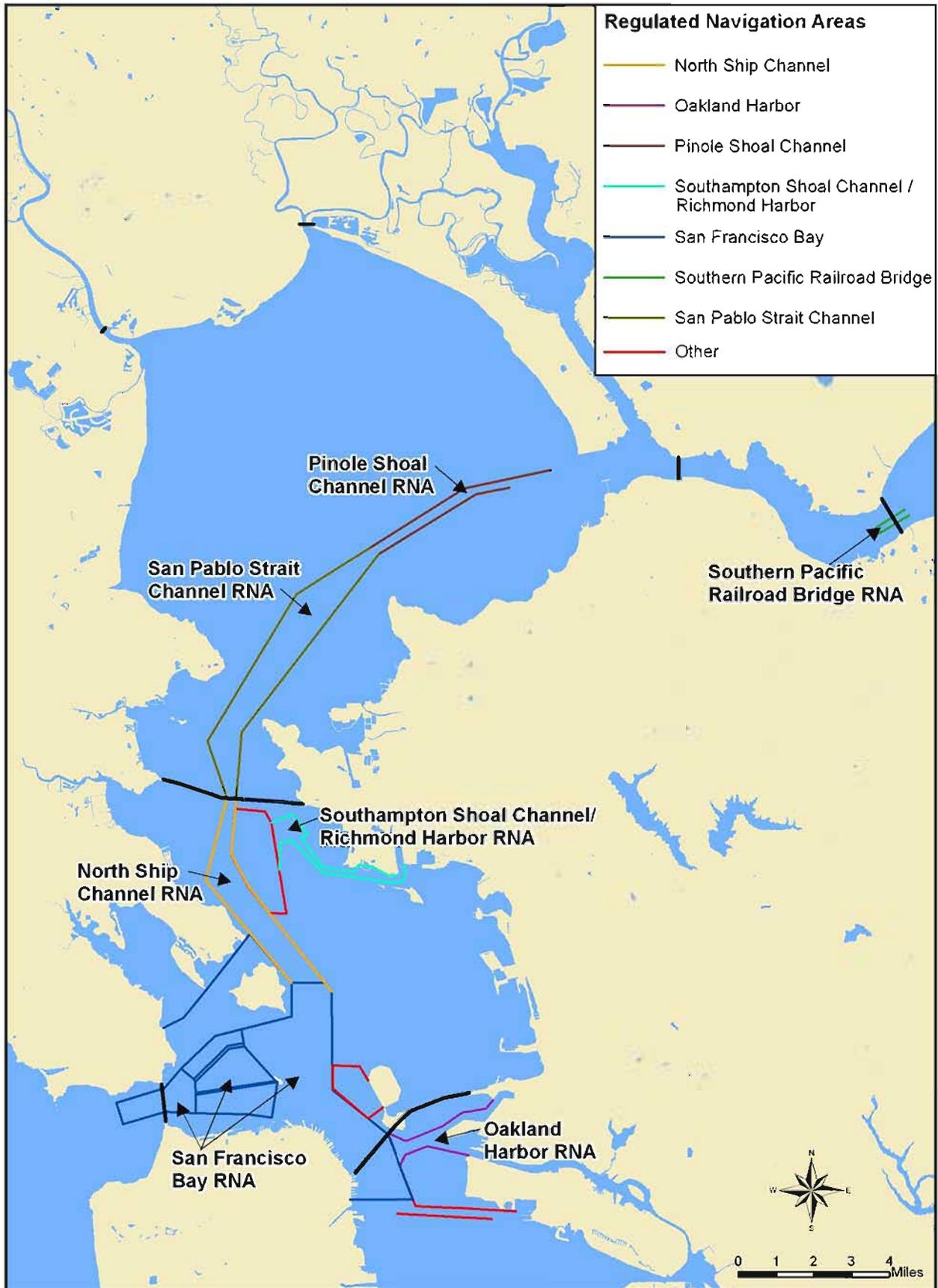
The actual number of fatalities reported for NMSBs in California is relatively low compared to motorized boating: a total of 139 injuries and 95 fatalities, comprising just over 200 separate incidents, were reported for the entire state in the 12 years from 1995 through 2006 (Cal Boating 2009). Over 90 percent of the fatalities were due to drowning. In contrast, there were 35 motorized boating fatalities in 2006 alone. Although the greatest number of fatalities was associated with white water kayaking (36, or 38%), perceived low risk activities including fishing, recreating, and general paddling accounted for the remainder. San Francisco Bay had eight reported NMSB accidents during this period (the number of fatalities, if any, in San Francisco Bay during this period is not available).

SHIPPING LANES AND FERRY ROUTES

As noted earlier, recreational NMSB use in San Francisco Bay is a dispersed recreation activity. With the exception of established exclusion zones enforced by the USCG, no agency or specific Bay-wide program directs NMSBs where or where not to travel. For safety, larger vessels are constrained to specific routes as described below.

REGULATED NAVIGATION AREAS

The area monitored by the USCG Vessel Traffic Service (“VTS area”) “begins” at the outer limit of the Offshore Sector (a 38.7-nautical-mile radius around Mount Tamalpais), includes Central San Francisco Bay, and ends at the Port of Redwood City in the south. To the north and east, it extends to the entrance to the Petaluma River, into the Napa River as far as the Mare Island Causeway Bridge, and upriver to Sacramento and Stockton. Central San Francisco Bay is the busiest part of the VTS area. It must be traversed by each tanker, container ship, and other large vessel inbound to any of the Bay Area's ports, and also by almost every scheduled ferry route in the Bay Area. It is also one of the most popular recreational sailing areas in the United States, resulting in a challenging transit for large ships on busy summer weekends. The VTS area is shown in Figure 3.4.2-1.



**Figure 3.4.2-1
Regulated Navigation
Areas in the San Francisco
Bay VTS Area**

Navigation data from WTA EIR



GEC Co Environmental Consulting

Within San Francisco Bay itself, the Coast Guard has established the Regulated Navigation Areas (RNAs) shown in Figure 3.4.2-1 and summarized in Table 3.4.2-4. The RNAs increase navigational safety by organizing traffic flow patterns for large vessels; reducing meeting, crossing, and overtaking situations between large vessels in constricted channels; and limiting vessel speed. RNAs apply to large vessels only, defined as power-driven vessels of 1,600 or more gross tons, or tugs with a tow of 1,600 or more gross tons. When navigating within the RNAs, large vessels follow specific guidelines. They must have their engines ready for immediate maneuver, operate their engines in a control mode and on fuel that allows for an immediate response to any engine order, and not exceed a speed of 15 knots through the water. RNAs have a high density of large vessel traffic, and thus may pose additional hazards to NMSBs.

FERRY ROUTES

There are currently six major ferry routes on the Bay, with an average of 78 daily one-way transits. Operating ferry terminals are located in San Francisco, Larkspur, Sausalito, Tiburon, Vallejo, Harbor Bay, Oakland, and Alameda (Figure 3.4.2-2).

The San Francisco Bay Water Emergency Transportation Authority (WETA) is a regional agency authorized by the State of California (SB 976) with the authority over and control of all public transportation ferries in the Bay Area region, except those owned and operated by the Golden Gate Bridge District. It was created in 2007 from the San Francisco Bay Water Transit Authority.

Figure 3.4.2-2 also illustrates proposed ferry routes being considered by WETA for ferry service expansion. New terminals may eventually be located in Antioch, Berkeley, Hercules/Rodeo, Martinez, Mission Bay (San Francisco), Oyster Point (South San Francisco), Redwood City, Richmond, and Treasure Island (San Francisco) (WETA 2009).

SECURITY ZONES AND RESTRICTED AREAS FOR SAN FRANCISCO BAY

Security zones are areas that must be avoided by boaters not expressly permitted to enter them. They are monitored and enforced by the USCG, and a violation may result in six months in jail and/or \$250,000 in fines (criminal) or a \$32,500 civil fine. Temporary moving security zones have been established for cruise ships and tank ships (tankers) as well as naval and contract naval vessels which enter and depart from San Francisco Bay. The purpose of these zones is to provide boater safety and prevent terrorist acts. These temporary moving security zones are activated when the vessel passes a specific point when entering the Bay and are deactivated when the vessel leaves that zone. When activated there is a security zone that is a 100-yard radius around the ship. Temporary fixed security zones are activated when a ship docks at any San Francisco Bay or Delta port. Specific rules have been established for vessels proposing to enter security zones (33 CFR 165.T11-098) and must be followed to avoid the penalties outlined above.

TABLE 3.4.2-4. REGULATED NAVIGATION AREAS

Name	Description
San Francisco Bay RNA	Extends from the precautionary zone east of the Golden Gate Bridge to Alcatraz Island. Because of the large number of vessels entering and departing San Francisco Bay, traffic lanes are established under the Golden Gate Bridge and in the Central Bay to separate opposing traffic and reduce vessel congestion. Because vessels converge and cross in such a manner that one-way traffic flow patterns could not be established, two precautionary areas were established in this RNA. These are the Golden Gate Precautionary Area, which encompasses the waters around the Golden Gate Bridge between the Golden Gate and the Central Traffic Lanes; and the Central Bay Precautionary Area, which encompasses the large portion of the Central Bay and part of the South Bay.
Oakland Harbor RNA	Encompasses the Oakland Bar Channel, Oakland Outer Harbor Entrance, Middle Harbor, and Inner Harbor Entrance channels. A power-driven vessel of 1,600 or more gross tons, or tug with a tow of 1,600 or more gross tons, cannot enter this RNA while another vessel or tug meeting these same criteria is navigating within its boundaries, if such an entry would result in meeting, crossing, or overtaking the other vessel.
North Ship Channel and San Pablo Strait Channel RNAs	Consists of the existing charted channels and delineates the only areas where the depths of water are sufficient to allow the safe transit of large vessels. The strong tidal currents in these channels severely restrict the ability of large vessels to safely maneuver to avoid smaller vessels.
Pinole Shoal Channel RNA	A constricted waterway where use is reserved for vessels 1600 gross tons or greater.
Benicia-Martinez Railroad Drawbridge RNA	Consists of a small, circular area, 200 yards in radius, centered on the middle of the channel under the Bridge. The limited horizontal clearance results in a greater chance of vessel collisions with the bridge, which is significantly increased when visibility is poor. Large vessels are prohibited from transiting through the bridge navigation lift span when visibility is 0.5 nautical miles or less.



**Figure 3.4.2-2:
Existing and Proposed
Ferry Routes**

Data Sources: Bay Area Eco Atlas 1999 SFEI,
Water Emergency Transportation Authority



GECO Environmental Consulting

The following sites also have security zones (USCG 2008):

- Coast Guard Island Pier in the Oakland Estuary encompassing the waters around the pier and extending out to the edge of the channel;
- 25 yards around any pier and abutment of the Golden Gate and San Francisco/Oakland Bay Bridges
- 500-yard slow transit zone around all naval vessels or contract naval vessels greater than 100 feet in length
- 200 yards around the San Francisco and Oakland International Airports marked by buoys, in navigable waters of the Bay
- 500 yards around the three existing piers at the Military Ocean Terminal Concord during periods when military shipments are being moored; all other times it is 100 yards

“Restricted Areas” are defined for the purpose of prohibiting or limiting public access to a specified water area. Restricted Areas generally provide security for U.S. Government property and/or protection to the public from the risks of damage or injury arising from the U.S. Government’s use of that area. The following location is the only Restricted Area (33 CFR 334) in San Francisco Bay:

- 100 yards around the eastern shore of Yerba Buena Island, surrounding the Coast Guard Base

The Yerba Buena Restricted Area has the following limitations (33 CFR 334.1065):

1. All persons and vessels are prohibited from entering the waters within the Restricted Area for any reason without prior written permission from the Commanding Officer of the Coast Guard Group San Francisco on Yerba Buena Island.
2. Mooring, anchoring, fishing, transit and/or swimming shall not be allowed within the Restricted Area without prior written permission from the Commanding Officer of the Coast Guard Group San Francisco on Yerba Buena Island.

(c) *Enforcement.* The regulation in this section shall be enforced by the Commanding Officer of the Coast Guard Group San Francisco on Yerba Buena Island, and such agencies and persons as he/she shall designate.

3.4.3 LOCAL SETTING

Potential navigational risks and challenges vary greatly depending on the specific location of the site (including local security zones, RNAs, tides, currents, weather patterns, and the presence of other recreational boats), as well as the time of year and potentially the time of day. Potential site-specific navigational risks and challenges will be evaluated as part of the trailhead designation process.

3.4.4 REGULATORY SETTING

WT sites will be subject to a variety of federal, state, county, and municipal regulations pertaining to navigation.

FEDERAL REGULATIONS

U.S. COAST GUARD

The USCG oversees management and enforcement of navigation in San Francisco Bay through a series of regulations that govern navigational practices, marine events, and safety and security zones within the Bay. The Inland Navigational Rules and the VTS mandated by the Port and Waterways Safety Act of 1972 were described previously. The Inland Navigation Rules apply to all watercraft and address vessel sailing and steering, as well as use of lights and sound. Knowing and following the Rules is required for all mariners – including those using NMSBs. As discussed above, large commercial and naval vessels are required by Coast Guard regulations to use designated traffic lanes when traveling in inland waterways, and the Rules oblige other vessels (including NMSBs) not to “impede the passage” of these deep-draft vessels traveling in the lanes. Ferry boats and other small commercial vessels (e.g., tugboats and private vessels) often do not navigate within specific traffic lanes, but rather travel in the most direct route. For interactions between other vessel types that are common on the Bay, particularly for NMSBs, the Rules are less explicit.

Although some small and private vessels are not required to coordinate their movements by contacting the VTS, the USCG monitors all commercial, Navy, and private marine traffic within San Francisco Bay and local coastal waters. The USCG also enforces the Security Zones and Restricted Areas described above.

STATE REGULATIONS

LEMPERT-KEENE-SEASTRAND OIL SPILL PREVENTION AND RESPONSE ACT/HARBOR SAFETY COMMITTEE OF THE SAN FRANCISCO BAY REGION

The Harbor Safety Committee of the San Francisco Bay Region was created by the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act. The purpose of the committee is to prepare a Harbor Safety Plan that considers all vessel traffic for the safe navigation and operation of tankers, barges, and other vessels. The original Harbor Safety Plan for San Francisco, San Pablo and Suisun Bays was adopted in 1992. The most recent available San Francisco Bay Region Harbor Safety Plan is for 2009 (HSC 2009).

The Harbor Safety Committee of the San Francisco Bay Region is composed of representatives from the maritime community, port authorities, pilots, tug operators, the USCG, the Office of Spill Prevention and Response (OSPR), the petroleum and shipping industries, and others with expertise in shipping and navigation. The Committee meets regularly to develop additional strategies to further safe navigation and oil spill prevention. The Harbor Safety Committee includes a Prevention through People subcommittee that focuses on safety for non-motorized vessels.

CALIFORNIA DEPARTMENT OF BOATING AND WATERWAYS (CAL BOATING)

The California Harbors and Navigation Code vests authority with Cal Boating to regulate matters of navigational safety for the state’s boating public. Cal Boating has a number of programs to support recreational boating, including grants and loans for boating law enforcement and boating safety education. Cal Boating also maintains a system for reporting boating accidents. California

law (Section 656 of the California Harbors and Navigation Code) requires a boater who is involved in an accident to file a written report with Cal Boating when:

- A person dies, disappears, or is injured requiring medical attention beyond first aid; or
- Damage to a vessel or other property exceeds \$500, or there is complete loss of a vessel.

Cal Boating staff review reported accidents, determine the causes, and identify preventative measures and specific safety-related problems. Safety education and public information program staff incorporate these safety problems and related solutions into updated course materials, promotional activities, and brochures.

OTHER REGIONAL AND LOCAL AGENCIES AND REGULATIONS

The San Francisco Bay Water Emergency Transportation Authority (WETA) is the regional agency which controls all public transportation ferries in the Bay Area region, except those owned and operated by the Golden Gate Bridge District. The Implementation and Operations Plan (WTA 2003) described the current and proposed future ferry routes within the Bay. On June 18, 2009 the WETA adopted the Final Transition Plan, which discusses the expansion of ferry service, addition of new routes, and/or rerouting service that will be implemented as funding is available. The following new routes are expected to be constructed: Oakland to South San Francisco Bay to begin service in 2011, Berkeley to San Francisco service to begin in 2012, and Treasure Island to San Francisco (no date of service), as well as other longer-term expansion.

As discussed earlier, under the California Harbors and Navigation Code, local governments can also regulate recreational boating in waters within their jurisdiction through time-of-day restrictions, speed zones, special-use areas and sanitation and pollution controls. These local regulations would be evaluated as part of the trailhead designation process.

3.4.5 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Impacts to navigational safety would be considered significant if implementation of the WT Plan would:

- Affect safe navigation on the Bay, resulting in increased death by drowning (as reported to Cal Boating and/or the USCG), and/or
- Result in substantial increases in the number of incidents reported by the VTS

METHODOLOGY

Potentially significant impacts identified in the Initial Study are evaluated for their impact due to implementation of the WT Plan. Potential impacts were identified based on review of applicable regulations, and on information gathered from various agencies having responsibility for navigational safety, including the USCG, Cal Boating, and WETA. For each impact area, the navigational safety impact analysis incorporated the WT strategies that would minimize potential impacts where applicable and identified additional program strategies or strategy refinements for mitigation if needed. Applicable WT strategies (See Appendix D) are referenced and summarized as appropriate.

REGIONAL IMPACTS AND MITIGATION MEASURES

IMPACT NAV-1: INCREASED RISK OF INCIDENTS INCLUDING ACCIDENTS INVOLVING LOSS OF LIFE, OR COLLISIONS BETWEEN NMSB USERS AND OTHER BOATS

Accidents involving NMSBs can be grouped into those that involve only the NMSB, and those that involve other vessels. An accident involving more than one vessel is referred to as a multi-vessel accident. A single-vessel accident could include a vessel colliding with a stationary object, a vessel capsizing due to rough water or poor user skills, and similar accidents. Those that involve other vessels may also be the result of indirect effects, where an inappropriate boating practice by a NMSB user leads to evasive action by another vessel, and causes that vessel to have an accident. Available accident data indicate that the majority (168 of 204) of reported NMSB accidents statewide between 1995 and 2006 were single-vessel accidents (Cal Boating 2009).

The WT does not provide for specific routes of travel, such as a system of point-to-point buoys that orient and direct use. WT users would more typically boat around the Bay margins rather than in the middle of the Bay. However, boating associated with the WT program may occur anywhere on the Bay, whether given conditions of the day make it safe or not.

NMSBs are often the smallest boats on the Bay, and most difficult for other mariners to see and avoid. Also, once on the water, a NMSB might enter or cross defined shipping channels and ferry routes presenting a potential navigational safety impact to both the larger vessels and the NMSB user.

Single-vessel accidents would typically be due to NMSB users either failing to take basic safety precautions (e.g., failing to wear PFDs), or overestimating their abilities to handle challenging conditions (e.g., being unable to control their vessels under challenging weather or tide and current conditions). Multi-vessel accidents (collisions) could be due to NMSB users being unable to control their boats, or lacking knowledge regarding navigation rules. An increase in NMSB use could potentially lead to an increased number of single and multi-vessel accidents. Increased NMSB use could also lead to increases in indirect accidents (e.g., groundings caused when a vessel tries to avoid a NMSB that is failing to properly yield right-of-way).

When WT Backbone Sites are located near commercial shipping activity or ferry vessel terminals, the chances for accidents between vessels increase. For WT sites located near or at existing or planned commercial or ferry terminals, potential boating conflicts can be minimized through careful site planning and design that clearly separate NMSB use launch areas and terminals (pers. comm., John Sindzinski, WETA, January 9, 2008).

Finally, wildlife protection buffer zones, if poorly planned, could result in directing NMSBs into unsafe areas, either areas that pose challenging environmental conditions (e.g., strong currents), or that are preferentially used by commercial or other larger vessels.

Several WT Strategies address the issue of navigational safety. The WT program includes the following strategies (see Table 2.3.3-1) that would be required prior to site designation to encourage navigational safety and minimize NMSB use incidents and accidents:

- Strategy 3 requires that the type and design of trail-related improvements match site characteristics, including avoiding uses of the site that are incompatible with safe boating.
- Strategy 12 encourages on-site concessions to provide site-specific safety information.
- Strategies 17 through 24 include a variety of programs that would educate the user about boating safety or provide for organized use that recognizes safety as a goal.

Impact Nav-1 would be reduced by the WT Plan strategies, but would remain potentially significant. The WT would increase educational materials and opportunities for NMSB users, and would emphasize safe boating practices. However, many factors that could lead to accidents on the water are not under the control of the WT. For example, drinking while boating is a major contributing factor to drownings. No system of education and training, including the WT programs and the mitigation measures outlined below, can ensure absolute user compliance with navigational rules and safe boating practices, or provide for risk-free navigation on the Bay. Implementation of the WT strategies would reach a large number of boaters, thereby increasing the percentage of NMSBs users who are familiar with and likely to practice safe boating. Impact Nav-1 is considered **potentially significant but mitigable** and would be mitigated by the addition of Mitigation Measures Nav-M1A through Nav-M1D, below.

MITIGATION MEASURE NAV-M1A: DEVELOP AND IMPLEMENT SAFETY SIGNAGE

As outlined in Strategy 17 and in cooperation with Cal Boating and site owners/managers, the WT program shall ensure inclusion of notices and/or maps of nearby commercial shipping or ferry terminal routes into signs at WT sites.

MITIGATION MEASURE NAV-M1B: SPONSOR WT TRAINING AND EDUCATION PROGRAMS

Additional training, education, and public advisory programs for NMSB users related to navigational safety requirements could reduce the risk of incidents associated with boating on the Bay. Therefore, consistent with WT Strategies 19 and 21, the WT program shall help coordinate education and training programs and provide links to web-based information to promote boating safety and to educate users about the unique conditions of operating NMSBs in the Bay's environments.

MITIGATION MEASURE NAV-M1C: DESIGN OF WT SITES NEAR COMMERCIAL SHIPPING AND FERRY TERMINALS.

Consistent with Strategy 3, for all sites near commercial shipping or ferry terminals, potential boating conflicts shall be minimized through careful site planning and design to clearly separate commercial shipping and NMSB use areas.

MITIGATION MEASURE NAV-M1D: PLANNING OF WILDLIFE BUFFER ZONES

For all sites where permanent buffer zones are implemented to protect wildlife, the buffer zones shall be evaluated to ensure that they are compatible with safe boating.

SITE-SPECIFIC IMPACTS AND MITIGATION MEASURES

IMPACT NAV-2: INCREASED RISK OF INCIDENTS DUE TO CHANGES IN FACILITIES OR NEW SITES

Significant changes in facilities and/or new WT sites could alter NMSB use patterns on the Bay, resulting in changes in travel patterns that could potentially put additional users into challenging

or high vessel traffic areas. In accordance with Strategy 3, facility improvements at individual sites would be consistent with the individual site's characteristics. With implementation of Strategy 3, this potential impact would be **less than significant**.

3.5 PUBLIC SERVICES

This section discusses the potential impacts of WT Plan implementation on public services. Navigational safety was addressed in Section 3.4, above.

3.5.1 INITIAL STUDY FINDINGS

The IS found potentially significant impacts associated with the need for increased fire and police protection, and increased service for parks and other public facilities. Implementation of the WT Plan would not affect the need for schools or services at schools.

3.5.2 REGIONAL SETTING

The USCG is the primary search and rescue agency in an aquatic emergency; however, many County sheriff departments, municipalities, and marina managers also provide emergency response when called for. For some non-emergencies the USCG may refer boaters to a commercial tow-boat service.

3.5.3 LOCAL SETTING

In most cases, regional and local municipal public agencies provide basic on-site services for recreation-related operations and management of existing marinas, shoreline parks, open space areas, and refuges. These services, however, are often complemented by other public agencies that provide shoreline fire protection, police protection, and emergency response services to recreational boaters while they are either accessing or boating on the Bay.

There are a myriad of agencies and organizations that individually provide public services to potential WT sites or do so through cooperative agreements with the site owner/ manager. Fire protection and emergency medical services are most often provided by local fire departments. Law enforcement services for selected WT sites are provided by managing agencies that have their own ranger/police units, such as the National Park Service, DFG, and the East Bay Regional Park District. Law enforcement services at the majority of WT sites, however, are provided either directly or through contract with County sheriff departments or local municipal police departments.

3.5.4 REGULATORY SETTING

FEDERAL REGULATIONS

The USCG oversees management and enforcement of navigation in San Francisco Bay through a series of regulations that govern navigation practices, marine events, and safety and security zones within the Bay (see discussion in Chapter 2 and Section 3.4). In addition to enforcement of navigation rules, the USCG also provides emergency rescue services.

STATE REGULATIONS

The California Harbors and Navigation Code vests authority with Cal Boating to regulate matters of navigational safety for the state's boating public (see discussion in Section 3.4). Cal Boating law enforcement staff also communicate these safety problems during Department-sponsored training sessions for law enforcement officers.

3.5.5 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Impacts would be considered significant if they would result in substantial increases in public service needs to maintain acceptable service ratios, response times or other performance objectives for police protection, parks operations, fire protection, water or sewer services, or emergency rescue on land or on the water.

METHODOLOGY

Two aspects of public services were evaluated: emergency response (accident-response, whether at the trailhead or on the water), and public safety (security and crime prevention). The potential additional emergency services needs resulting from the incremental increase in NMSB use associated with implementation of the Water Trail Plan was evaluated by assessing the estimated current number of incidents, and assuming a linear increase in emergencies with increased NMSB use based on projections provided by the Cal Boating survey (2009). The potential for the safety education provided as part of WT implementation to reduce the overall need for emergency response was also evaluated.

The need for added public safety services was evaluated in the same manner. New facilities or services provided at existing sites as a result of the trailhead designation process were considered in evaluating the potential need for additional public safety services.

REGIONAL IMPACTS AND MITIGATION MEASURES

Potential impacts associated with the need for additional public services would be site-specific. Given the very small number of incidents involving NMSBs recorded for San Francisco Bay (eight incidents between 1995 and 2006, Cal Boating 2009), and the anticipated relatively small incremental increase in NMSB use attributable to implementation of the WT Plan (see Chapter 2, Section 2.2), no significant regional increase in public service demand is anticipated. Furthermore, the safety education and safe boating messages that would be part of the implementation of the WT Plan would reach many boaters, not just those boaters attributable to the implementation of the WT. Thus, implementation of the WT Plan would not have an adverse impact (and could have a positive effect) on emergency service demands regionally.

SITE-SPECIFIC IMPACTS AND MITIGATION MEASURES

IMPACT PS-1: NEED FOR NEW FACILITIES OR SUBSTANTIAL INCREASE IN DEMAND FOR PUBLIC SERVICES

All launch sites require some active management to maintain and operate the launch access and related facilities. Without sufficient funding and staff resources devoted to upkeep, launch sites tend to degrade, becoming unusable or unsafe, and managers may be forced to remove or close access. Insufficient management resources for enforcement at launch sites can also leave site managers with little choice but to remove or restrict launching access. For example, vandalism or inability to prevent access to sensitive wildlife areas could force managers to restrict access to avoid further problems.

High Opportunity Sites would not be expected to have a substantial increase in use; therefore, there would be little change in the demand for public services at those sites. At other sites, however, development of new facilities, especially overnight facilities, may create a need to increase existing levels of ranger/police patrols; maintenance; sewer and water services; and/or fire and other emergency response services. Entirely new sites could likewise require increased public services.

The management responsibility for trailheads would rest with the site owner and/or manager. Implementation of the education, outreach and stewardship program of the Water Trail Plan, in accordance with Strategies 17, 18, 19, and 21 (see Table 2.3.3-1 or Appendix D) would support their efforts.

WT strategies recognize the challenges of ongoing management and maintenance needs. These strategies include WT Strategy 9 addressing restrooms and Strategy 13 addressing overnight accommodations. In addition, prior to site designation, the WT program includes the following actions that would help reduce the impacts to public services:

- Strategy 6 addresses the need to match facility improvements to management resources, including staffing and funding.
- Strategy 7 addresses the need to develop a plan for trailhead facility maintenance and operation, including identification of responsible parties.. This would be part of a Trailhead Plan.
- Strategy 22 specifically identifies a program of Trailhead Stewards that would assist the property owner/site manager with maintenance and other on-site management responsibilities.

Facility improvements at some WT sites may lead to increased use that may, in turn, result in small numbers of additional calls for local police or emergency services. Because WT sites are dispersed throughout the Bay, demands presented by most day-use WT users on police, emergency response, and fire services would be spread among a number of departments and would not excessively burden any one locality. This would allow departments to maintain acceptable service ratios while addressing the needs of the proposed project. At WT sites located near areas where safety or homeland security issues may exist, such as near airports or industrial areas, however, the introduction of a new WT site or increase in recreational use could require a police presence not typical in recreational settings.

Potential concerns associated with public services will be addressed through involvement of the site owner/manager in the development of the Trailhead Plan and by ensuring that management resources are available to support the proposed improvements (as required by Strategy 6), and that a maintenance and operations plan is developed as part of the trailhead designation process (Strategy 7). In addition, WT Strategy 23 would provide additional training to help local law enforcement become more effective in preventing environmental and wildlife violations at trailheads. Finally, development of new or support of existing trailhead steward programs would provide added resources at some trailheads to reduce vandalism and related activities. Implementation of Strategies 6, 7, 22, and 23 would make this impact **less than significant**.

IMPACT PS-2: SUBSTANTIAL EXPANSION OF PUBLIC SERVICE NEEDS FOR SITES DESIGNATED FOR OVERNIGHT USE OR UNACCEPTABLE INCREASE IN SERVICE RATIOS, RESPONSE TIMES OR OTHER PUBLIC SERVICE PERFORMANCE OBJECTIVES

Two overnight camping areas, both of which are identified as WT Backbone Sites, exist on the Bay. These are Kirby's Cove operated by the National Park Service, and Angel Island operated by the California Department of Parks and Recreation. Both of these camping areas are available on a reservation basis, and are typically booked months in advance.

Overnight use at new WT campsites and overnight parking areas would increase the need for policing and security patrols. While certain WT sites could accommodate camping, the addition of camping facilities could only occur if the organizational structure were in place to provide round-the-clock emergency and safety services and the funding necessary for managing overnight use. The addition of overnight use would particularly impact those land-managing agencies that do not currently allow overnight use within their jurisdictional lands. Availability of overnight camping may also draw significant interest from other recreationists.

Water Trail Strategies 6, 7, and 13 would minimize potential impacts from sites with overnight use. WT Strategy 13 encourages the designation of overnight accommodations consistent with land managers' policies and resources. The primary concern with regard to public services at sites that will provide new overnight camping facilities is the long-term management of the site, including ensuring that sufficient funding is available for public service providers.

Implementation of Strategies 6 and 7 in accordance with the implementation process for all strategies described in Chapter 2 would make this impact **less than significant**.

3.6 AESTHETICS

This section of the EIR assesses the potential impacts on aesthetic resources from the implementation of the WT. Because site-specific facility improvement plans are unknown at this time, this section focuses on potential visual quality effects of standard facilities as they may affect the aesthetic quality of typical Bayfront landscapes.

3.6.1 INITIAL STUDY FINDINGS

The IS found that implementation of the WT may have potentially significant impacts associated with visual quality. Other aesthetic considerations (noise, odors, light, and glare) were determined to have no potential for significant impacts in the Initial Study, and therefore were eliminated from further review.

3.6.2 REGIONAL SETTING

Urbanization and industrial uses characterize much of the San Francisco Estuary's margins, but major portions of the area around San Francisco Bay remain undeveloped or relatively free of buildings. In particular, views of and from tidal flats and salt marshes in many areas around the Bay include expanses of open space and natural areas. The ability of the shoreline landscape to visually absorb changes associated with development of the WT Backbone Sites and related activities thus varies with location. The general landscape setting within the geographic scope of the WT is discussed below.

URBAN SHORELINES

The visual character of urban shorelines as viewed from San Francisco Bay is generally dominated by a developed and highly managed landscape composed of an artificial shoreline edge in the foreground, with structures and landscaping in the middleground and background. The artificial edge may be port structures, piers, revetments, rip-rap, seawalls, or other structures. Narrow strips of tidal wetland vegetation may occur locally along the urban shoreline.

Urban shorelines are common over a broad part of Central San Francisco Bay. The few urban shorelines that do not fit the typical characteristics as described above include Arrowhead Marsh in San Leandro Bay, Crown Beach/Elsie Roemer Marsh in Alameda, and Crissy Field in San Francisco. They are nonetheless included in this group because they are surrounded by a highly developed, urban environment.

URBAN/WILDLAND INTERFACE

Urban development along the Bay shoreline often occurs adjacent to large expanses of wetlands within regional parks, wildlife refuges, and ecological reserves. This mix of urban development and natural-appearing wildlands prevails in South San Francisco Bay; most of the Marin County portion of Central San Francisco Bay; around expanding cities in San Pablo Bay along the northern Contra Costa County shoreline; and northern Suisun Marsh.

Natural areas intermixed with residential, commercial, and industrial or military port/marina developments occur along shorelines in Vallejo, Fairfield, Concord, San Rafael, and Richardson Bay.

RURAL OPEN SPACE / AGRICULTURAL

Visually undeveloped open space lands along the Bay edge are largely confined to San Pablo Bay, the vicinity of Suisun Marsh, and sections of the South Bay including the Coyote Hills Regional Park and the San Francisco Bay National Wildlife Refuge. Much of these areas are marshland, or wetland with sloughs and levees and, in the south Bay, salt ponds. A few of these areas have sandy or pebble beaches. The adjacent uplands may have trails or other recreational facilities, but these are visually subordinate to the vastness of the Bay and its margins. These landscapes are not dominated by prominent structures.

3.6.3 LOCAL SETTING

URBAN SHORELINES

Of the 112 Backbone Sites, 85 are located in urban areas where the shoreline's visual character is dominated by other development in the immediate vicinity. These sites are listed in Table 3.6.3-1. Of the 85 urban sites, 71 of the sites are existing launch sites, five are existing destinations, eight are planned launch sites and one is a planned destination.

URBAN/WILDLAND INTERFACE

Of the 112 Backbone sites, 17 are at the urban/wildland interface (see Table 3.6.3-1). Of the 16 sites at the urban/wildland interface, 13 of the sites are existing launch sites, two are existing destinations, and one is a planned destination.

RURAL OPEN SPACE/AGRICULTURAL

The remaining 10 Backbone sites are located in rural open space and agricultural areas (see Table 3.6.3-1). Four of these sites are existing launch sites, two are existing destinations, two are planned launch sites, and three are planned destinations.

3.6.4 REGULATORY SETTING

FEDERAL REGULATIONS

There are no applicable federal regulations that would affect potential alterations of the visual quality associated with the Backbone sites. However, specific plans applicable to certain sites on federal lands (e.g., NPS General Management Plans) may include specific requirements and standards.

STATE AND REGIONAL AGENCIES AND REGULATIONS

STATE SCENIC HIGHWAY PROGRAM

The State Scenic Highway Program was established in 1963 to preserve and protect scenic highway corridors from changes that would diminish the aesthetic value of lands adjacent to highways. As of July 2009, the following highways located near WT Backbone Sites were eligible to become State Scenic Highways, although none had yet received that designation (CalTrans 2009).

TABLE 3.6.3-1. VISUAL SETTING OF BACKBONE SITES

Site Map Key³⁰	Location	City/County	Characteristic Landscape
Urban Shoreline			
A1	Albany Beach	Albany	urban waterfront park
A2	Berkeley Marina, Ramp	Berkeley	urban marina/harbor
A4	Point Emery	Emeryville	urban waterfront park
A5	Shorebird Park	Emeryville	urban waterfront park
A6	Emeryville City Marina	Emeryville	urban marina/harbor
A8	Middle Harbor Park	Oakland	urban waterfront park
A9	Jack London Square/CCK	Oakland	urban boat launch
A11	Estuary Park/Jack London Aquatic Center	Oakland	urban waterfront park
A14	Robert Crown Memorial State Beach	Alameda	urban waterfront park
A18	Doolittle Drive; Airport Channel	Oakland	urban waterfront park
A12	Grand Avenue Boat Ramp	Alameda	urban boat launch
A15	Encinal Launching and Fishing Facility	Alameda	urban boat launch
A20	San Leandro Marina	San Leandro	urban marina/harbor
A25	Tidewater Boathouse	Oakland	urban boat launch
A26	Berkeley Marina, Small Boat Launch	Berkeley	urban boat launch
A28	Elmhurst Creek	Oakland	urban public access area
CC1	Martinez Marina	Martinez	urban marina/harbor
CC5	Rodeo Marina	Contra Costa County	urban marina/harbor
CC6	Pinole Bay Front Park	Pinole	urban waterfront park
CC9	Keller Beach	Point Richmond	urban waterfront park
CC10	Ferry Point	Point Richmond	urban waterfront park
CC11	Boat Ramp Street Launch Area	Richmond	urban boat launch
CC14	Richmond Municipal Marina	Richmond	urban marina/harbor
CC15	Marina Bay Park & Rosie Riveter Memorial	Richmond	urban waterfront park
CC16	Shimada Friendship Park	Richmond	urban waterfront park
CC17	Barbara & Jay Vincent Park	Richmond	urban waterfront park
CC19	Point Isabel Regional Shoreline	Richmond	urban waterfront park
CC20	SS Red Oak Victory	Richmond	historic ship – docked in urban port setting
CC23	Rodeo Beach	Contra Costa County	urban waterfront park
M3	Swede's Beach	Sausalito	urban waterfront park

³⁰ Site locations are shown on Figures 2.1.4-1A and 2.1.4-1B

TABLE 3.6.3-1. VISUAL SETTING OF BACKBONE SITES

Site Map Key³⁰	Location	City/County	Characteristic Landscape
M4	Turney Street Public Boat Ramp	Sausalito	urban boat launch
M5	Dunphy Park	Sausalito	urban waterfront park
M6	Schoonmaker Point	Sausalito	urban waterfront park
M8	Clipper Yacht Harbor	Sausalito	urban marina/harbor
M10	Shelter Point Business Park	Mill Valley	urban boat launch
M13	Brickyard Park	Strawberry	urban waterfront park
M16	Richardson Bay Park/ Blackie's Pasture	Tiburon	urban waterfront park
M19	Sam's Anchor Café	Tiburon	private launch adjacent to restaurant
M25	Higgins Dock	Corte Madera	urban boat launch
M27	Bon Aire Landing	Larkspur	urban boat launch
M28	Marin Rowing Association Boathouse	Larkspur	urban boat launch
M29	Ramillard Park	Larkspur	urban waterfront park
M30	San Quentin	San Rafael	urban waterfront park
M31	Jean & John Starkweather Shoreline Park	San Rafael	urban waterfront park
M33	Harbor 15 Restaurant	San Rafael	urban launch adjacent to restaurant
M35	Loch Lomond Marina: Ramp	San Rafael	urban marina/harbor
M36	Loch Lomond Marina: Beach	San Rafael	urban marina/harbor
M38	McNear's Beach	San Rafael	urban waterfront park
N6	Napa Valley Marina	Napa	urban marina/harbor
SC2	Alviso Marina	San Jose	urban waterfront park
SF1	Candlestick Point State Recreation Area	San Fran. Co.	urban waterfront park
SF2	India Basin Shoreline Park	San Francisco	urban waterfront park
SF4	Islais Creek	San Francisco	urban waterfront park
SF6	The "Ramp"	San Francisco	urban boat launch adjacent to restaurant
SF7	Pier 52 Boat Launch	San Francisco	urban boat launch
SF8	South Beach Harbor (AKA Pier 40)	San Francisco	urban marina/harbor
SF9	Treasure Island	San Francisco	urban public access area
SF10	Aquatic Park	San Francisco	urban waterfront park
SF11	Gas House Cove (aka Marina Green)	San Francisco	urban marina/harbor
SF12	Crissy Field	San Francisco	urban waterfront park
SF13	Brannan St Wharf	San Francisco	urban boat launch
SF14	Northeast Wharf Park	San Francisco	urban waterfront park
SM4	Redwood City Municipal Marina	Redwood City	urban marina/harbor

TABLE 3.6.3-1. VISUAL SETTING OF BACKBONE SITES

Site Map Key³⁰	Location	City/County	Characteristic Landscape
SM6	Docktown Marina	Redwood City	urban marina/harbor
SM9	Redwood Shores Lagoon	Redwood Shores	urban waterfront park
SM11	Beaches on the Bay	Foster City	urban waterfront park
SM12	Foster City Lagoon Boat Park	Foster City	urban waterfront park
SM13	East 3rd Ave	Foster City	urban waterfront park
SM16	Seal Point Park	San Mateo	urban waterfront park
SM17	Coyote Point, Marina	San Mateo	urban marina/harbor (adjacent to waterfront park)
SM18	Old Bayshore Highway	Burlingame	urban public access area
SM20	Colma Creek/Genentech	So San Francisco	urban public access area
SM21	Oyster Point Marina	So San Francisco	urban marina/harbor
SM22	Brisbane Marina	Brisbane	urban marina/harbor
SM23	Coyote Point, Beach	San Mateo	urban waterfront park
SM24	Westpoint Marina	Redwood City	marina/harbor
Sn6	Petaluma Marina	Petaluma	urban marina/harbor
Sn7	Petaluma River Turning Basin	Petaluma	urban boat launch
So1	Brinkman's Marina	Vallejo	urban boat launch
So2	California Maritime Academy	Vallejo	urban boat launch
So7	Matthew Turner Park	Benicia	urban waterfront park
So8	West 9th Street Launching Facility	Benicia	urban waterfront park
So9	Benicia Point Pier	Benicia	urban waterfront park
So10	Benicia Marina	Benicia	urban marina/harbor
So12	Suisun City Marina	Suisun City	urban marina/harbor
Urban/Wildland Interface			
CC2	Carquinez Strait Reg. Shoreline (Eckley Pier)	Martinez	waterfront park
CC8	Point Molate Beach Park	Richmond	waterfront park
CC21	Point Pinole	Pinole	waterfront park
CC22	Bay Point Regional Shoreline	Contra Costa County	waterfront park
M1	Kirby Cove	Sausalito	waterfront park
M2	Horseshoe Cove	Sausalito	waterfront park
M11	Bayfront Park	Mill Valley	waterfront park
M39	China Camp State Park	San Rafael	waterfront park
M40	Bull Head Flat	San Rafael	waterfront park

TABLE 3.6.3-1. VISUAL SETTING OF BACKBONE SITES

Site Map Key³⁰	Location	City/County	Characteristic Landscape
M41	Buck's Landing	San Rafael	private marina
M43	John F. McInnis Park	San Rafael	waterfront park
M47	Black Point Boat Launch	Novato	boat launch
N1	Cutting's Wharf	Napa County	public boat launch
N8	Riverside Drive Launch Ramp	Napa	public boat launch
SC3	Palo Alto Baylands Launching Dock	Palo Alto	waterfront park
SM2	Ravenswood Open Space Preserve	Menlo Park	waterfront park
Sn5	Papa's Taverna/ Lakeville Marina	Petaluma	marina/restaurant
Rural and Agricultural			
A22	Eden Landing Ecological Reserve	Hayward	refuge/reserve
A24	Jarvis Landing	Newark	privately owned (business)
A27	Coyote Hills	Fremont	refuge/reserve
A30	Hayward's Landing	Hayward	refuge/reserve
M17	Angel Island State Park	Marin County	waterfront park
N2	JFK Memorial Park	Napa	waterfront park
N7	Green Island Boat Launch Ramp	Amer. Canyon	public boat launch
SM25	Corkscrew Slough Viewing Platform	Redwood City	refuge/reserve
So5	Belden's Landing	Fairfield	public boat launch
Sn3	Hudeman Slough	Sonoma County	public boat launch

- Highway 37: From Marin County where it joins Highway 101, east through Sonoma to Solano until the junction with Interstate 80 in Solano County
- Highway 121: In Sonoma County from the junction with Highway 37 northeast to near the junction with Highway 12 near the City of Sonoma and from the near the junction with Highway 221 in Napa to the junction with Trancas Street in Napa.
- Highway 29: In Solano County from the junction with Highway 37 to Napa County with the junction of Highway 221
- Highway 1: On the approach to the Golden Gate Bridge in San Francisco and in Marin County until the split with Highway 101
- Highway 4 and 160: In Contra Costa County from the Delta crossing on Highway 160 south and inland
- Interstate 80: On the approach to the Bay Bridge to the Interstate 580 split

These eligible highways would become designated as State Scenic Highway if the local governing body applies to Caltrans for scenic highway approval, adopts a Corridor Protection Program, and receives notification that the highway has been officially designated a Scenic Highway.

LOCAL AND REGIONAL REGULATIONS

MCATEER-PETRIS ACT AND SUISUN MARSH PROTECTION ACT

BCDC adopted the *San Francisco Bay Plan* (1968, 2007a) to regulate land uses within its shoreline band (the land area between the shoreline and the line 100 feet upland and parallel to the shoreline). The *Bay Plan* contains the following recommendations with respect to visual quality:

Appearance, Design and Scenic Views

- 1. To enhance the visual quality of development around the Bay and to take maximum advantage of the attractive setting it provides, the shores of the Bay should be developed in accordance with the Public Access Design Guidelines.*
- 2. All bayfront development should be designed to enhance the pleasure of the user or viewer of the Bay...*
- 4. Structures and facilities that do not take advantage of or visually complement the Bay should be located and designed so as not to impact visually on the Bay and shoreline. In particular, parking areas should be located away from the shoreline...*

CITY AND COUNTY GENERAL PLANS

Each city and county has a general plan with land use, open space, conservation, recreation, and other elements containing policies pertaining to scenic resources, and may identify areas within their jurisdictions of high scenic value (including sensitive viewsheds, scenic routes, and viewpoints) that require special consideration when making development decisions. Special districts and other jurisdictions (e.g., East Bay Regional Park District) may also have plans and policies pertaining to scenic resources. These plans and policies would be identified at a site-specific level during the trailhead designation process.

3.6.5 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Impacts would be considered significant if they would:

- Substantially degrade the existing visual character or quality of the site and its surroundings, and/or
- Have a substantial adverse effect on a scenic vista

METHODOLOGY

This visual analysis is based on the methodology used by the California Department of Transportation (Caltrans), the U.S. Department of Transportation, and the Federal Highway Administration. Three visual traits that are considered are intactness, vividness, and unity. “Intactness” is the visual integrity of the landscape (natural and man-made) and the degree to which various elements seem to belong together. “Vividness” is the visual power or

memorability of the landscape. “Unity” is the visual harmony of the landscape considered as a whole (DOT 1983). Visual impacts are also considered in terms of viewer sensitivity, which is a measure of public concern for changes to scenic quality that includes viewer activity, view duration, distance from visible objects (foreground, middleground, and background), adjacent land uses, and special planning designations such as scenic route designation.

San Francisco Bay and its environs are known worldwide as a scenic resource. Viewer groups from around the Bay that may be affected include tourists, individuals pursuing a variety of outdoor recreation pursuits and residents with views of the Bay shoreline. Viewer sensitivity levels are considered high throughout the Bay region.

REGIONAL IMPACTS AND MITIGATION MEASURES

The visual effects of implementation of the WT Plan would be localized, at and near the Backbone Sites. Most sites would not be visible, or would have minimal visual presence, in views of or from any other WT Backbone Site. In addition, visual changes attributable to the implementation of the WT would be very limited. They would consist of site-appropriate signage at all trailheads, and a variety of improvements to facilities at some specific trailheads. Therefore, implementation of the WT Plan would not result in the potential for any regionally significant impacts.

SITE-SPECIFIC IMPACTS AND MITIGATION MEASURES

Potential visual impacts to WT trailheads would occur primarily at sites where construction of some type is undertaken. However, limited visual impacts could also occur from the installation of signage. Potential site-specific impacts are discussed below.

IMPACT AESTH-1: DEGRADATION OF VISUAL QUALITY OF A WT SITE OR ITS SURROUNDINGS

Any changes in visual characteristics at a trailhead attributable to implementation of the WT would be due to the construction of new facilities or improvements to existing facilities. As described in Chapter 2, Project Description, potential WT improvements at non-HOS launch sites could include:

- **Signage.** The size, design, and location of a sign determine its aesthetic impacts. The content and size(s) of WT signs at trailheads will vary depending on the needs at a specific trailhead. Signs may include various types of educational and safety information, and provide specific information about sensitive environmental resources in the vicinity of the trailhead. All trailheads will have a signage plan (either a stand-alone plan for HOSs, or as part of the Trailhead Plan for other Backbone Sites). The Signage Plan will consider the aesthetics of the proposed WT signage for each site. In addition, all signs will be consistent with BCDC’s signage guidelines.
- **Boat Launching Ramps and Boarding Floats.** The type of boat launching ramp or boarding float constructed determines its potential visual impact. Because of their low profile, simple wooden boat launching ramps (without guard rails) and boarding floats are not highly visible from land or the Bay (see Figures 3.6.5-1a and b) and do not represent a visually prominent component in the landscape. Wooden boat launching ramps with guard-rails are slightly higher profile and more visible (see Figure 3.6.5-1c). Boat launching ramps that are wheelchair accessible can be larger structures that, depending on the

materials used, may be visually prominent unless they are screened by topography or vegetation as seen from the Bay or other vista points (see Figure 3.6.5-1e).

- **Parking.** Parking is required at most launch sites, and not necessary at destination sites. Parking lots can occupy a substantial portion of land areas at access sites. Although most facility parking would be low-lying and not visually prominent, larger parking lots may be visible from the Bay or from vista points that are elevated above the WT site. BCDC guidelines suggest that parking be located inland from the Bay's edge so as not to impact views to or from the Bay.
- **Restrooms.** Restrooms are present at all but two (M10 and SF7) of the HOSs. Of the existing non-HOSs, seven have restrooms while 31 do not. Restroom facilities may range from small portable toilets to larger structures up to 15 feet or more in height (see Figure 3.6.5-1f). Depending on their design and location, restroom structures could be a visually prominent component in the landscape and could possibly block views towards the Bay.
- **Boat Storage and Concession Facilities:** WT facilities may include boat houses for all boat types; fenced outdoor storage areas for outrigger canoes; modified shipping containers for kayaks and sailboards; and provision of inside dock ties at marinas for in-water storage of dragon boats, whaleboats, and kayaks. Boat houses and other forms of land-side boat storage can be visually prominent depending on their design and materials. Concession stands for boat rentals and for food and beverage also may be developed at some WT sites.
- **Overnight Camping Facilities:** Overnight camping facilities may be developed as part of the WT (beyond the two existing sites at Kirby Cove and Angel Island). Overnight camping facilities would be similar to those of many shoreline parks and may include picnic tables, maintenance access routes, and trash and recycling containers. Camping features are generally low in profile and, depending on their design and materials, would not be visually prominent components in the landscape.
- **Additional Use Amenities:** WT site improvements may include many features typically found along shoreline parks, such as family and/or group picnic areas (with tables, drinking fountains, and trash and recycling containers); landscaping; bicycle racks; lighting³¹; emergency phones; trail system connections, and signage. Rigging areas (for sailboarders) and boat-washing facilities are additional WT access amenities that may not be found in typical parks. These features are generally small in scale and, depending on their design and materials used, would not be highly visually prominent or affect the visual unity of the overall landscape.

Visual changes to sites designated as HOS, which make up 57 of the 112 Backbone Sites would, by definition, be limited to only minimal improvements (i.e., signage). The development of the

³¹ Lighting was not considered to have a significant impact in the Initial Study and is not addressed further in this EIR.

FIGURE 3.6.5-1: VISUAL CHARACTER OF WT SITES AS SEEN FROM LAND



Figure 3.6.5-1a. Highly developed site: marina with ramp, floats and commercial kayak rentals (City Kayak, South Beach, San Francisco)



Figure 3.6.5-1b. Highly developed site: marina with ramp and float (Petaluma Marina)



Figure 3.6.5-1c. Relatively undeveloped site in waterfront park: ramp with floats (Doolittle Dr. MLK Shoreline Park, Oakland)



Figure 3.6.5-1d. Beach launch inaccessible when tide is out (Middle Harbor Park, Port of Oakland)



Figure 3.6.5-1e. Wheelchair-accessible boat ramp (Pier 1½, San Francisco)



Figure 3.6.5-1f. ADA-compliant bathroom (Middle Harbor Park, Oakland)

Signage Plan and conformance with BCDC signage guidelines will ensure that potential aesthetic impacts from signage at these sites will be less than significant. In addition, twelve sites (including three HOSs) are designated as destination-only sites rather than launch sites and improvements for these sites would likely be minimal. All of these sites, provided signage and other minimal improvements are designed in accordance with WT guidelines, would not be expected to have a significant effect on the aesthetic values of a site.

Some of the remaining 43 non-HOS launch sites could potentially be subject to substantial facility improvements, especially the seven planned launch sites. Any such improvements would be described in a Trailhead Plan that would be required prior to designation of the site as a WT trailhead. Potential effects to the general bayfront landscape types from potentially substantial facility improvements are summarized below.

Urban Shorelines

Given the complexity of the built environment at the water level for the majority of sites in urban shoreline areas, it is unlikely that any facility improvements associated with the WT would be distinguished from other local development. Several sites are located in areas of particular scenic beauty along San Francisco Bay, with views of the most famous features of the built environment (such as the Golden Gate Bridge, Bay Bridge, City of San Francisco, Alcatraz) and of the background natural setting of undeveloped hills and mountains. Given the scale and panoramic nature of these shoreline area views, localized facility improvements at WT sites would not intrude into or dominate the view. As seen from the water, the WT access point facilities in urban shoreline areas would not necessarily be particularly visually prominent. The existing level of development would dominate the visual prominence of any additional facilities, which would tend to blend in with the site as seen from the immediate foreground views.

Many of the WT sites are in urban waterfront parks that appear as open, landscaped areas in an otherwise densely populated urban setting. Generally they are developed with a variety of amenities. See Figures 3.6.5-1c, Martin Luther King Shoreline Park, and 3.6.5-1d, Middle Harbor Park, both in Oakland, for typical examples of waterfront parks.

A large number of the urban WT sites are located in marinas. Typical marina development includes larger motorized boats and a variety of docks, floats and walkways. The marinas often are associated with restaurants, cafes and other small retailers in a dense patchwork of waterfront buildings. These areas may receive large numbers of visitors whose main purpose is water-based recreation or enjoyment of the waterfront scenery. Some of these areas have only recently been redeveloped from former industrial sites. The Oakland waterfront near Jack London Square is an example of this.

For sites in urban areas with modified shorelines and significant existing improvements, the visual impacts of WT improvements with design considerations that respect the characteristic setting would be less than significant.

Urban/Wildland Interface

Many WT sites in urban/wildland interface settings are located in existing park or open space lands that are generally prized for their less-developed character in an otherwise densely populated setting. Many provide spectacular views of the Bay. These areas generally have

visitor-serving amenities such as parking, restrooms, and trails. If the WT access point is near existing improvements, NMSB facility improvements would not greatly affect the visual integrity of the area. If the WT site is located in a more naturally appearing, undeveloped area, however, it may be highly visually prominent and detract from the intactness and unity of the area.

Examples of WT sites at the urban/wildland interface, not located in park or open space lands but still located outside the major urban centers are N1: Cutting's Wharf, Napa County and Sn5: Papa's Taverna/Lakeville Marina. Existing improvements at such sites are usually very simple with a dock and possibly a ramp, perhaps parking or a restroom, with the area maintaining a low-development character. These basic facilities, already present, do affect the view of the site and from the site.

Some of the WT sites are located at undeveloped beaches where the provision of access facilities might be highly distinctive as seen from the Bay, although perhaps less visually prominent from the land as they may be screened by topography and vegetation.

Rural/Agricultural

In general there are few existing amenities at these sites. Two of the existing launches (A24: Jarvis Landing; Sn3: Hudeman Slough) within this type of landscape do not have restrooms, although they do have parking. As the areas are generally low-lying, new restroom or storage buildings near the shoreline could be visually prominent components of the landscape as seen from inland and from the Bay. Any noticeable change in the undeveloped character and unity of these sites caused by site construction may require modification of natural features or removal of vegetation but would be unlikely to restrict views.

WT Strategies and Required Design Reviews

For those Backbone Sites where enhancement is expected to be more than a minimal improvement, such as the installation of a sign, a Trailhead Plan would be created and development plans would be reviewed by BCDC as part of the permitting process. Depending on the level of proposed development, the BCDC permit would be subject to design review conducted either administratively or by the BCDC Design Review Board. The aesthetic design of the proposed facilities and visual impacts of a project would be considered prior to the issuance of a BCDC permit. Specific guidelines developed by BCDC for public access improvements along the Bay shoreline address aesthetics and are summarized in *Shoreline Spaces: Public Access Design Guidelines for the San Francisco Bay* (2005). In addition, most local agencies have design review provisions in their zoning ordinances that would apply to WT improvements on privately owned sites in their jurisdictions.

The Trailhead Plan would be reviewed by the Project Management Team and Advisory Committee for compliance with the following WT Plan strategies that are intended to reduce visual impacts:

- Strategy 3 requires that the type and design of trail-related improvements match site characteristics, including helping preserve the character of the trailhead setting and increasing the quality of boaters' experiences.
- Strategy 5 requires the development and updating, as needed, of design guidelines for trail-oriented access improvements.

Even with BCDC design review and implementation of the above strategies, the potential impact to aesthetic resources from substantial construction at a WT site, particularly a less-developed site located in a relatively more natural setting, is considered **potentially significant**. To reduce visual impacts of site improvements to **less than significant** levels, the following mitigation measure shall be implemented:

MITIGATION MEASURE AESTH-M1: INCLUDE VISUAL CHARACTERISTICS AND SITE RELATIONSHIPS IN DESIGN GUIDELINES AND TRAILHEAD PLANS.

When design guidelines are developed for WT trailhead improvements pursuant to Strategy 5, and for each Trailhead Plan for new or expanded WT sites, the following design relationships shall be addressed:

- New access facilities, including restrooms, parking lots, boat storage buildings, and ramps shall be designed to be as low in profile as feasible, made from materials that are in character with the surroundings and, if possible, screened from view with native landscaping.
- For sites where the characteristic landscape is essentially natural in appearance, WT facilities shall be restricted to the minimum necessary to implement the WT Plan.
- Locations for all new sites shall be chosen to avoid blocking view corridors to and from the water, where feasible, or shall be designed to minimize blockages to the view corridors.
- New or expanded parking facilities shall not be located directly on the water's edge, and shall preferably be shielded from views to and from the water by existing structures and/or native landscaping.

IMPACT AESTH-2: DEGRADATION OF A SCENIC VISTA OR VIEW FROM AN ELIGIBLE STATE SCENIC HIGHWAY

No State Scenic Highways have yet been designated in areas that would be affected by WT sites. Some WT sites may be located in an area of notable scenic value, or part of a scenic vista where counties or cities may have enacted ordinances that guide development. Site-specific impacts and any conflicts with visually sensitive sites, viewsheds, or vistas designated in local or regional plans are possible and would be assessed in project-level reviews. Strategy 4 calls for trailhead plans to be consistent with plans, policies and priorities of local land and resources managers. It also calls for education, signage and design guidelines to be consistent with existing policies, plans, and standards. Because all trailhead plans will be reviewed to assure compliance with the WT strategies, this impact would be **less than significant**.

3.7 BIOLOGICAL RESOURCES – VEGETATION

The discussion of biological resources is divided into three sections. This section (3.7) discusses the existing sensitive vegetation resources of San Francisco Bay and provides an assessment of the potential impacts to these resources. Wildlife resources are discussed in Sections 3.8 (Birds) and 3.9 (Other Species). An overview of the habitats of San Francisco Bay and a discussion of the regulations applicable to biological resources is presented here, but pertains to Sections 3.8 and 3.9 as well.

Vegetation resources could be affected by project-related construction and increased NMSB use. “Vegetation” refers to the overall plant cover of a habitat, including its structural and other physical features, in addition to the species composition. Vegetation provides:

- Value as wildlife habitat (cover, food resources),
- Physical ecological functions (sediment trapping, erosion buffering),
- Chemical ecological functions (biogeochemical soil processes: sequestering or cycling carbon, mineral nutrients, contaminants), and/or
- Inherent biological diversity (rare plant species or biologically important genetic variation among populations).

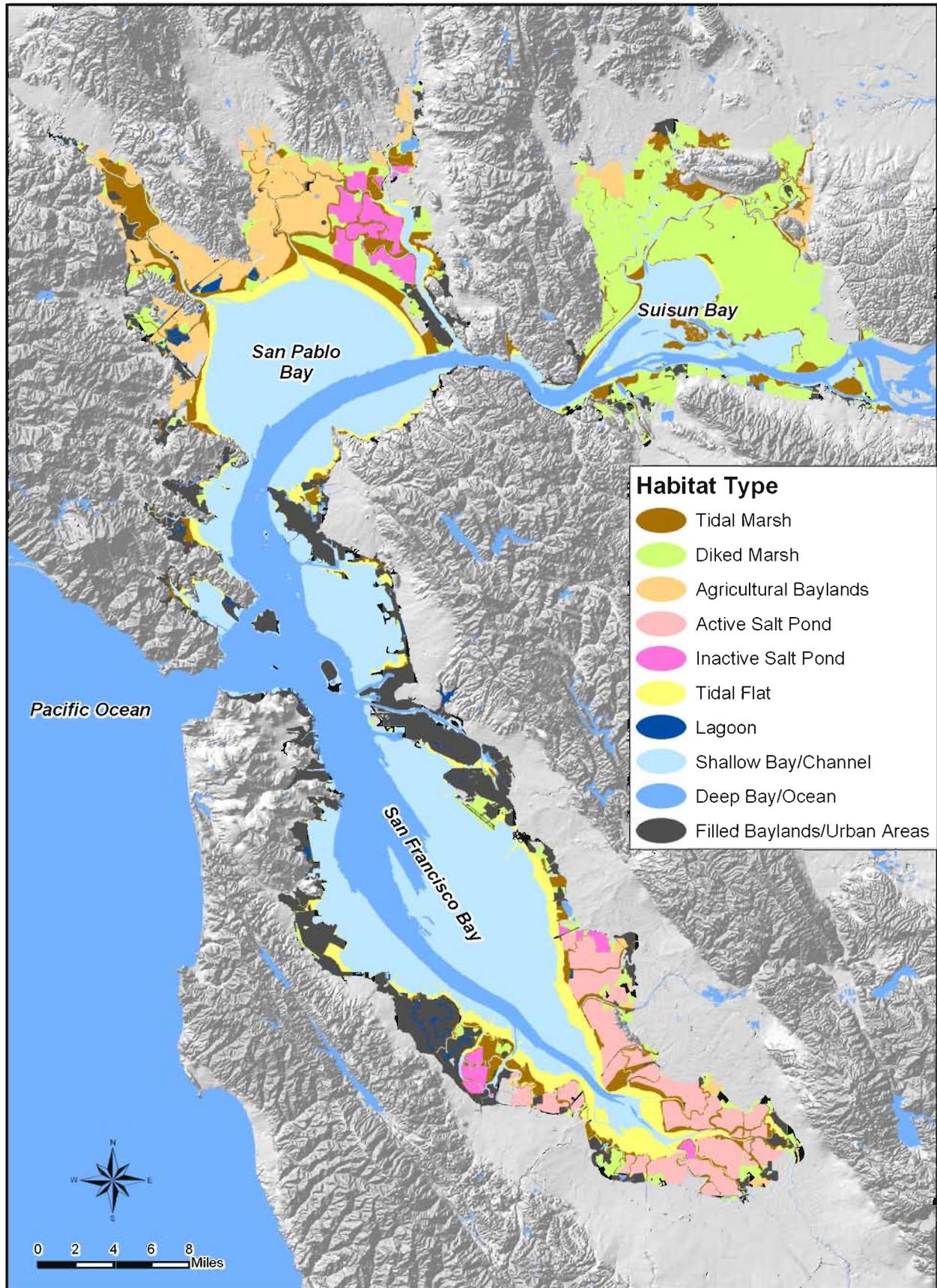
Important biological diversity of plants may occur at the level of population (genetic variation), species (rare plant conservation), and community (e.g., relatively intact or natural vegetation stands). Some plants can also have negative resource values, particularly invasive non-native noxious weeds of wetlands and terrestrial habitats. This section identifies potential impacts to vegetation resources, and recommends mitigation strategies to reduce or eliminate those impacts.

3.7.1 INITIAL STUDY FINDINGS

The Initial Study for this project identified potentially significant impacts to wetlands and other sensitive habitats, and to sensitive species. The IS also identified potential conflicts with Habitat Conservation Plans, other approved conservation plans, and local ordinances protecting biological resources, as well as the potential for spread of invasive species. Potential impacts related to vegetation are evaluated in this section; potential impacts to birds and other species are addressed in Sections 3.8 and 3.9, respectively.

3.7.2 REGIONAL SETTING

There is substantial regional variation in the vegetation of tidal and non-tidal baylands in the San Francisco Estuary (Goals Project 2000). WT sites may be located near areas ranging from only sparse or weedy non-native vegetation with limited habitat function, to extensive marshes with well-developed, mature native marsh vegetation. In addition, different types of marshes and shoreline vegetation in different parts of the Estuary support different plant and wildlife species (including special-status species). Geographic variation in vegetation and habitats provides an important context for evaluating potential WT impacts to special-status plant and wildlife species, and wetlands. Major bayland vegetation communities and habitats are summarized below. Bayland habitats are indicated on Figure 3.7.2-1. The general landscape structure of the region’s vegetation and habitats within the geographic scope of the WT is described below.



**Figure 3.7.2-1
Bayland Habitats**

Wetland habitat data from EcoAtlas (1998)

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REGIONAL LAND USES

The bayland environment varies among geographic subregions in the Bay (Figure 3.7.2-1) and with the predominant land uses: urban (commercial, residential, industrial/port), urban/wildland interface, rural, and agricultural. For the purposes of discussion of biological resources, San Francisco Bay is divided into Suisun Bay, San Pablo Bay, Central San Francisco Bay, and South San Francisco Bay (see Figure 3.7.2-2). The habitat types and associated vegetation vary within each type of land use.

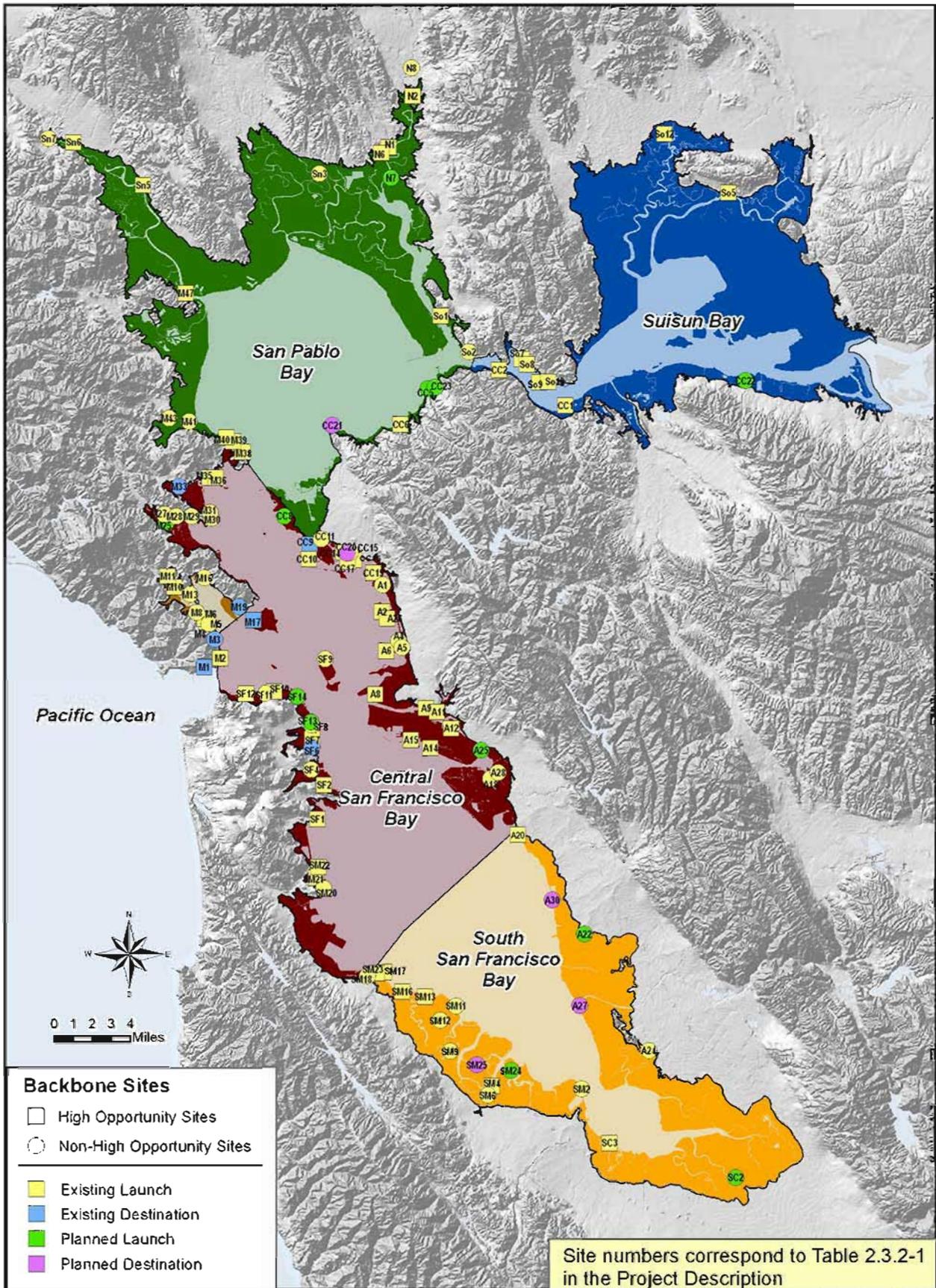
URBAN SHORELINES

Urban shorelines in the San Francisco Estuary are generally formed by artificial fill and structures armored with revetments, seawalls, rip-rap, pilings, and other structures. Waterways and embayments adjacent to urban shores are often dredged. Where present, tidal wetland vegetation and habitats adjacent to urban shores are often formed on steep slopes, and are relatively recently formed (historic infilled sediment) in narrow strips. They are usually dominated by relatively few widespread and common marsh species, with a high proportion of non-native marsh species. Special-status plant species, with a few important exceptions, are usually absent in urban shores. On the terrestrial side of urban shorelines, natural or native vegetation is generally lacking or minimal. Non-native terrestrial vegetation (especially annual grasses, broadleaf weeds, and escaped or planted non-native ornamental trees and shrubs) is prevalent along most urban shores of commercial developments, ports, frontage roads, former military bases, and industrial sites. Many Backbone Sites are located in an urban landscape setting.

Urban land uses predominate in the Central Bay and tend to override natural or potential geographic variation in vegetation and habitats of adjacent baylands and shore vegetation. Exceptions occur where significant erratic patches of natural or restored native shore vegetation are included within entirely urbanized landscapes, such as Arrowhead Marsh in San Leandro Bay, Crown Beach/Elsie Roemer Marsh in Alameda, or Crissy Field in San Francisco. In northern SF Bay (San Pablo Bay and eastward) intensive urban land uses more often occur within a matrix of open space and wildland vegetation, where more sensitive native vegetation and habitats co-occur with urban development.

URBAN/WILDLAND INTERFACES

Urban (or suburban) development along the shores of the Bay is extensive, and often occurs adjacent to large blocks of wetland habitats within regional parks, wildlife refuges, and ecological reserves owned and managed by state or municipal agencies. Large, continuous blocks of native vegetation and habitats, often including old and species-rich remnants, are close to urban shorelines in these areas. This matrix of urban/wildland interface prevails in shorelines of South San Francisco Bay, most of Marin County along Central San Francisco Bay and San Pablo Bay, around expanding cities in San Pablo Bay along the northern Contra Costa shoreline, and northern Suisun Marsh. The proximity of source populations of sensitive species to urban areas also increases the potential for sensitive species to establish opportunistically in urban shorelines.



**Figure 3.7.2-2
Bay Subregions**

Bay Water Trail GIS data provided by BCD
Bay subregion data from SFEI EcoAtlas



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WETLANDS AND
WATER RESOURCES, INC.

For example, some sensitive plant populations occur adjacent to residential, commercial, and industrial or military port/marina developments along shorelines in Vallejo, Fairfield, Concord, San Rafael, and Richardson Bay. The density of Backbone Sites is relatively high in the urban/wildland setting.

RURAL AND AGRICULTURAL HABITATS

Large blocks of ecologically important wetland and adjacent upland habitats are most likely to occur in rural and agricultural settings of the Bay, where travel distances to major urban populations are longest. True undeveloped open spaces (i.e., areas with original soils intact) along the bay edge are largely confined to San Pablo Bay and the vicinity of Suisun Marsh. The entire matrix of the landscape is likely to support at least remnants of the original pre-reclamation biological diversity of native habitats. The density of Backbone Sites is relatively low in the rural and agricultural landscape setting of San Pablo Bay and Suisun Marsh.

HABITAT TYPES

There are eight primary habitat types within the areas potentially impacted by the Water Trail. These include two types of open water habitats, four types of wetland habitats (tidal salt marsh, tidal brackish marsh, diked non-tidal salt marsh, and diked non-tidal fresh to brackish marsh), estuarine beaches, and other terrestrial habitats bordering the Bay shoreline. WT users may encounter these habitats at or near a trailhead and during excursions. Some of these habitats could also be affected by construction of facilities at WT sites.

OPEN WATER HABITATS

Open water habitats within San Francisco Estuary are classified into two categories: shallow bay defined as subtidal areas above 18 foot depth below Mean Lower Low Water (MLLW)³², and deep bay defined as subtidal channels deeper than 18 feet below MLLW. San Francisco Bay currently contains almost 172,000 acres of shallow bay/channel habitat, and more than 82,000 acres of deep bay/channel habitat (Goals Project 1999). Primarily unvegetated soft bottom sediments (bay muds and sand deposits) lie underneath most shallow and deep-water habitats, but some shallow bay habitats contain stands of eelgrass (*Zostera marina*), which serve as valuable habitat for a wide range of fish and invertebrates. Eelgrass beds are also associated with uncommon nearshore areas with coarser sediment, or rocky substrates infilled with mud or sand. The restoration of eelgrass habitats is currently the focus of multiple research and implementation efforts throughout the Bay. Other shallow bay areas are focal areas for the restoration of native oyster beds, which have largely disappeared from the Bay.

TIDAL SALT MARSH

Tidal salt marshes are jurisdictional (state- and federally regulated) wetlands (see Section 3.7.4). They are distributed primarily around San Francisco Bay and the inner margins of San Pablo Bay. They are characterized by prevalence of native marsh plants that can tolerate wetland soil salinity that frequently approaches marine salinity (34 parts per thousand salt) during the growing season. Most modern salt marshes in the Bay are generally dominated by relatively few

³² Lower low water is the lower of the two low waters of any tidal day. Mean lower low water is the average height of the lower low waters over a 19-year period. For shorter periods of observation, corrections are applied to eliminate known variations and reduce the result to the equivalent of a mean 19-year value.

native plant species, such as pickleweed (*Sarcocornia pacifica*), saltgrass (*Distichlis spicata*), fleshy jaumea (*Jaumea carnosa*), and sometimes large summer “blooms” of parasitic salt marsh dodder mats (*Cuscuta salina*). Marsh gumplant (*Grindelia hirsutula*; syn. *G. stricta* var. *angustifolia*, *G. x paludosa*) vegetation is widespread along marsh banks of tidal sloughs, where it provides important high tide cover for wildlife. A suite of non-native plant species, many of which are highly invasive, has established abundantly in salt marsh vegetation, including hybrid cordgrass and Mediterranean saltwort (*Salsola soda*) (see “Invasive Species of Tidal Marshes and Adjacent Baylands” below).

TIDAL BRACKISH MARSH

Tidal brackish marshes are jurisdictional (state- and federally regulated) wetlands. Tidal brackish marshes are characterized by an assemblage of plants associated with bay water that is diluted enough by fresh water during the growing season to support a prevalence of tall, emergent sedge family plants, such as tule, bulrush (*Schoenoplectus* spp.), alkali-bulrush (*Bolboschoenus* spp.), and sometimes cattail (native *Typha latifolia*, non-native *T. x glauca*, *T. angustifolia*) species. Tidal brackish marshes border navigable sloughs in the Alviso/San Jose area, Palo Alto, and nearly all of northern San Pablo Bay, Suisun Marsh, and the northern Contra Costa shoreline, and often occur near Backbone Sites in these locations.

Tidal brackish marshes typically support gradients or sharp zones of vegetation between slough banks and marsh plains. Brackish marsh plains usually support patchy mixtures of salt marsh plants like saltgrass and pickleweed, with other brackish marsh plants such as rushes (*Juncus arcticus*; syn. *J. balticus*), and many other tidal marsh broadleaf plants. Invasive non-native broadleaf pepperweed (*Lepidium latifolium*), or invasive non-native populations of common reed (*Phragmites australis*) are widespread and often dominant over extensive areas in brackish tidal marshes.

DIKED NON-TIDAL SALT MARSH

Diked, non-tidal salt marshes adjacent to tidal waters (separated by dikes) are generally jurisdictional (state- and federally regulated) wetlands. Diked non-tidal salt marshes ordinarily support simple vegetation with low plant species diversity. They are usually dominated by pickleweed, or simple mixtures of pickleweed and saltgrass. Such diked non-tidal salt marshes often decline in salinity over time, and admit various non-native weeds such as broadleaf pepperweed.

Diked non-tidal salt marsh and other seasonal wetlands sometimes border navigable sloughs. They are highly visible from adjacent levees, and are often mostly drained from spring to fall. Diked non-tidal salt marshes occur throughout San Francisco Bay and San Pablo Bay, and some, mostly near Fremont (Warm Springs vicinity), Napa, and Fairfield, may contain subsaline/alkaline vernal pool habitats.

DIKED NON-TIDAL FRESH TO BRACKISH MARSH

Non-tidal, diked fresh-brackish marshes adjacent to tidal waters (separated by dikes) are generally jurisdictional (state- and federally regulated) wetlands. They support predominantly freshwater perennial marsh vegetation (tules, cattails, common reed) or sedge family plants that tolerate higher peak soil salinity, such as alkali-bulrush. Some diked baylands, particularly in the

North Bay, also support variable fresh-influence brackish marsh vegetation in seasonal shallow ponds, and even some vernal pool-associated plants. Diked non-tidal fresh to brackish marshes are widespread in northern San Pablo Bay, Suisun Marsh, and the Contra Costa shoreline, and they also occur locally in diked baylands near points of nonsaline wastewater discharges near San Jose, Mountain View, Sunnyvale, and Palo Alto.

ESTUARINE BEACHES

Beaches composed of sand, shell fragments, gravel, or artificially placed sediments occur mostly in Central San Francisco, South San Francisco, and San Pablo Bays. Beaches support a mix of native estuarine beach and dune plants that are uncommon within the San Francisco Estuary. Beaches near public access are often attractive and heavily used for recreation, but inaccessible bay beaches are often protected as sensitive shorebird, tern, or marine mammal habitats (e.g., sand spits of Brooks Island, Richmond; Roberts Landing in San Leandro) and support native beach vegetation. Bay beaches are also highly attractive, accessible and efficient for use as landings by small craft.

OTHER TERRESTRIAL HABITATS BORDERING ESTUARY SHORELINES

Other terrestrial vegetation types in natural or artificial soils occur adjacent to the Estuary's shorelines (Holstein 2000), but most terrestrial vegetation near potential WT trailheads would occur in bay fill or levee soils in diked Baylands, and would typically be highly disturbed and composed primarily of non-native landscaping. This is because most true natural terrestrial soils and general vegetation types (such as coastal bluff scrub, oak woodland, riparian woodland) are associated with steeper hillslope soils or valleys that seldom contact the modern Bay, as a result of historic diking.

SENSITIVE AND SPECIAL-STATUS PLANTS

A number of special status plant species occur around wetlands of the Bay. These are listed in Table 3.7.2-1 and summarized by Bay region below. With a few important exceptions, sensitive plant species are either absent or very rare along urbanized shorelines close to the largest populations of recreational NMSB users. Shorelines of semi-urban, agricultural, or rural settings, shoreline and marsh habitats are more likely to support sensitive plant habitats and populations. The distribution of sensitive plant species is highly variable around the Bay, and each sub-region within the Bay supports a distinct regional suite of sensitive species. Special status species other than those noted below have been recorded in the region, but are either extinct or are in habitats that would not be affected by the project, and therefore are not discussed further in this section. For example, smooth popcornflower and soft popcornflower (*Plagiobothrys glaber*, *Plagiobothrys mollis*) are both presumed extinct in the San Francisco Bay area, and have not been reported from the vicinity of lowlands bordering the Bay, or baylands, in over a century. Many other special-status plant species occur around the Bay Area (appearing in special-status species lists based on location within U.S. Geological Survey quadrangle sheets), but are too remotely located to be relevant to impacts associated with WT activities, which would be concentrated in shoreline or marsh vegetation, or on open water.

Central San Francisco Bay

Richardson Bay supports numerous populations of northern or Point Reyes bird's-beak (*Cordylanthus maritimus* ssp. *palustris*), which sometimes occurs in high salt marsh edges near

TABLE 3.7.2-1. SPECIAL-STATUS PLANT SPECIES WITH POTENTIAL TO BE AFFECTED BY WT PLAN

Name	Status	Ecology and Bay Area Distribution	Potential Occurrence in Areas of WT Use
<i>Arthrocnemum subterminale</i> Alkali pickleweed	SoC - regional	Perennial subshrub, similar to common pickleweed, but regionally rare in San Francisco Estuary; not rare statewide. Typically occurs near alkali clay soils. Recent populations are known from Fremont and Suisun Marsh.	Low potential. Infrequently occurs near tidal slough banks, and shorelines near open water access mostly near Suisun Marsh.
<i>Atriplex joaquiniana</i> San Joaquin saltbush	CNPS 1B, SoC	Annual forb occurs primarily in interior alkali soils, seasonal wetlands, but also rarely in tidal marsh edges. Seeds are dispersed by floating fruits. Populations may be transient at specific locations. Recent populations are reported from Fremont, Napa River, and Suisun Bay area. Not easily identified or detected.	Low potential. May opportunistically colonize high tide shorelines in northeast San Pablo Bay, Suisun Marsh, Contra Costa shoreline. May occur in seasonal saline/alkaline wetlands, southeast San Francisco Bay.
<i>Astragalus tener</i> var. <i>tener</i> Alkali-milkvetch	CNPS 1B, SoC	Small low-growing annual forb of alkali seasonal wetlands, vernal pools. Limited seed dispersal, but likely able to persist as dormant seed. Recent populations are known to occur in Fremont. Not easily identified or detected.	Very low potential. Historic localities in Solano, Alameda counties.
<i>Castilleja ambigua</i> (ssp. undetermined; salt marsh ecotypes) Salt marsh owl's-clover	SoC (CNPS 1B?)	Small erect or spreading annual forb, hemiparasitic, like bird's-beak. Distinct regional ecotypes are rare in high tidal marsh edges (salt or brackish). One population (Benicia) may be rare subspecies <i>humboldtensis</i> (CNPS 1B). Extirpated in San Francisco Bay, where it was formerly widespread. Apparently limited seed dispersal, but likely able to persist as dormant seed. Not easily identified or detected.	Low potential to occur near along marsh shoreline of Point Pinole, Southhampton Bay, Suisun Marsh, Contra Costa shoreline.
<i>Centromadia parryi</i> ssp. <i>congdonii</i> Congdon's tarplant	CNPS 1B	Erect annual resinous forb of seasonal wetlands or alkaline clay soils. Population locations and sizes are likely to fluctuate. Recent populations have been reported from South San Francisco Bay localities in or in the vicinity of diked baylands (Newark to Sunnyvale). May potentially occur along high tidal marsh edges. Detection difficult because of similarity to common tarweed species.	Low potential for occurrence on levees, diked baylands, or high tidal marsh edges.
<i>Cicuta maculata</i> var. <i>bolanderi</i> Bolander's water-hemlock	SoC	Tall perennial forb, possibly extirpated in San Francisco Bay. Formerly endemic and abundant in Suisun Marsh. No recent reports known.	Very low potential to occur along brackish tidal marsh slough banks, Suisun Marsh and Contra Costa shoreline.
<i>Cirsium hydrophilum</i> var. <i>hydrophilum</i> Suisun thistle	CNPS 1B, FE, SE	Short-lived coarse perennial forb, endemic to high tidal brackish marsh plains of Suisun Marsh; most populations fluctuate among years. Known locations near Rush Ranch and Hill Slough. Apparently limited dispersal, confined to vicinity of known populations in recent decades.	Very low potential to occur near tidal brackish tidal marsh banks or on marsh plains, western Suisun Marsh.
<i>Cordylanthus</i>	CNPS	Annual forb, hemiparasitic; restricted to high	Variable: negligible chance of

TABLE 3.7.2-1. SPECIAL-STATUS PLANT SPECIES WITH POTENTIAL TO BE AFFECTED BY WT PLAN

Name	Status	Ecology and Bay Area Distribution	Potential Occurrence in Areas of WT Use
<i>maritimus ssp. palustris</i> Northern salt marsh bird's-beak	1B, SoC	tidal salt marsh. Populations usually in colonies that often persist but fluctuate significantly among years. Apparently limited seed dispersal, but likely able to persist as dormant seed. Recent populations are known from Richardson Bay, Corte Madera, Novato, and Petaluma Marsh. Extirpated in the rest of Central Bay, South Bay. Difficult to detect except in early summer (flowering) during years of abundance. Known recent populations occur near or along shoreline trails in Richardson Bay.	occurrence in San Francisco Bay area outside of Marin County shorelines, but moderate to low chance of occurrence in Marin County.
<i>Cordylanthus mollis ssp. mollis</i> Soft bird's-beak	CNPS 1B, FE, SE	Annual forb, hemiparasitic. Restricted to high brackish tidal marsh. Populations usually occur in colonies that often persist but fluctuate significantly among years. Recent populations are known from Napa Marsh, Southampton Marsh, east of Point Pinole, Contra Costa shoreline, Suisun Marsh. Difficult to detect except in summer (flowering) during years of abundance.	Low potential to occur along brackish marsh edges of northeast San Pablo Bay, Suisun Marsh, Contra Costa shoreline.
<i>Lasthenia conjugens</i> Contra Costa goldfields	CNPS 1B, FE	Small annual forb, usually colonial in alkali vernal pools and similar seasonal wetland habitats; historically also rare along bayshore. Known recent locations near Fremont, Napa River, and Fairfield (north of Suisun Marsh). Apparently limited dispersal, confined to vicinity of known populations in recent decades. Difficult to detect except in spring (flowering) during years of abundance.	Very low potential to occur along contemporary bay shorelines or adjacent diked baylands supporting seasonal wetlands.
<i>Lasthenia glabrata</i> (tidal marsh populations only)	SoC	Small annual forb associated statewide with vernal pools and seasonal wetlands, but San Francisco Bay populations in salt pan edges, high salt marsh and brackish marsh have become rare and localized to Petaluma Marsh, Point Pinole, Suisun Marsh.	Low potential to occur near trailheads or landings bordering sloughs or bay.
<i>Lathyrus jepsonii var. jepsonii</i> Delta tule pea	CNPS 1B, SoC	Tall climbing perennial forb, occurring along tidal marsh banks of sloughs in Napa-Sonoma Marsh and Suisun Marsh. Conspicuous when in bloom (summer), but may be difficult to detect during droughts (saline years) in Napa Marsh.	Variable potential to occur along contemporary bay shores, mostly along fringing tidal marshes of Napa River and its sloughs, and Suisun Marsh. Negligible potential to occur elsewhere in San Pablo or San Francisco Bays.
<i>Lepidium oxycarpum</i> Small-fruited peppergrass	SoC - regional	Tiny annual forb associated with dry edges of alkali vernal pools and (historically) salt marsh edges of San Francisco Bay. Difficult to detect. Likely extirpated in most baylands. Not rare globally or statewide.	Low potential. Similar and related species occur in Newark, near existing boat launch facilities.
<i>Lilaeopsis masonii</i> Mason's lilaeopsis	CNPS 1B, SR	Creeping grass-like and diminutive perennial forb, typically restricted to brackish tidal marsh banks subject to slumping or wave	Low to moderate potential to occur along bay shores of contemporary northeastern San Pablo Bay, Suisun

TABLE 3.7.2-1. SPECIAL-STATUS PLANT SPECIES WITH POTENTIAL TO BE AFFECTED BY WT PLAN

Name	Status	Ecology and Bay Area Distribution	Potential Occurrence in Areas of WT Use
		erosion, or nearby tidal marsh; also occurs in mud on rip-rap or concrete. Known populations occur from northern San Pablo Bay (Tolay Creek mouth) east through Suisun Marsh and Contra Costa shoreline. Difficult to detect.	Marsh, or Contra Costa shorelines.
<i>Navarretia prostrata</i> Prostrate navarretia	CNPS 1B, SoC	Annual low-growing forb, restricted to vernal pools and similar seasonal wetlands. In San Francisco Bay, known only from Fremont, but not near Bay shore.	Very low potential to occur in diked baylands adjacent to San Francisco Bay. No potential to occur in tidelands.
<i>Polygonum marinense</i> Marin knotweed	CNPS 3	Formerly restricted in San Francisco Bay to tidal marshes near Larkspur (Marin County), but this species has spread widely across the North Bay and western Suisun Bay area; it is sometimes locally common. It may be a misidentified non-native (invasive) species.	Moderate potential to occur in tidal marshes of the North Bay, western Suisun Marsh, and Contra Costa shoreline.
<i>Symphotrichum lentum</i> (syn. <i>Aster lentus</i>) Suisun Marsh aster, Marsh aster (This species includes the plant formerly treated as <i>Aster chilensis</i> var. <i>sonomensis</i> of northern San Pablo Bay)	CNPS 1B, SoC	Tall perennial forb, typically forming colonies along brackish or freshwater marsh banks or upland edges tidal marshes in northern San Pablo Bay eastward to Suisun Marsh and Contra Costa shoreline. Presumed extirpated in San Francisco Bay. Conspicuous in flower, but difficult to distinguish from common aster except in flower (fall).	Low to moderate potential to occur in tidal marshes of Napa Marshes east to Suisun Marsh and Contra Costa shoreline. Negligible potential to occur in San Francisco Bay.
<i>Suaeda californica</i> California sea-blite	CNPS 1B, FE	Conspicuous spreading subshrub of sandy salt marshes and estuarine beaches. Original San Francisco Bay population was extirpated, but reintroduced populations have been established since 2000 at several Central Bay localities: Crissy Marsh (Presidio), two San Francisco bayshore sites, Emeryville, and San Leandro. No spread from sites of reintroduction has been detected.	Very low potential to occur except at known sites of reintroduction.
<i>Suaeda moquinii</i> Bush seepweed	SoC - regional	Subshrub associated with alkali or subsaline clay soils in baylands locally in Fremont/Warm Springs. Not rare statewide.	Low potential. In San Francisco Bay, known populations are restricted to Fremont/Warm Springs area, but have spread locally in diked baylands.
<i>Spartina foliosa</i> Pacific cordgrass, California cordgrass	SoC - regional	Tall emergent perennial grass restricted to mid-intertidal marshes and mudflats (low marsh) in San Francisco Bay, San Pablo Bay, and western Suisun Marsh (rarely to eastern Suisun Marsh). In San Francisco Bay, rapidly replaced by invasive hybrids between this species and <i>S. alterniflora</i> since mid-1990s. Intact populations are abundant in San Pablo Bay.	Very high potential to occur along San Francisco Bay and San Pablo Bay marshes and tidal shores.
<i>Trifolium depauperatum</i> var.	CNPS	Small low-growing annual herb of seasonal wetlands, vernal pools, or brackish tidal	Very low potential to occur in diked or tidal marsh habitats of northern San

TABLE 3.7.2-1. SPECIAL-STATUS PLANT SPECIES WITH POTENTIAL TO BE AFFECTED BY WT PLAN

Name	Status	Ecology and Bay Area Distribution	Potential Occurrence in Areas of WT Use
<i>hydrophilum</i> Saline clover	1B, SoC	marsh. Recently reported populations occur in northern San Pablo Bay between Sears Point and Sonoma Creek in diked baylands and adjacent lowlands. Difficult to detect and distinguish from common subspecies.	Pablo Bay and Suisun Marsh.
CNPS List 1B - rare, threatened, or endangered in CA and elsewhere CNPS List 4 – plants of limited distribution; watch list FE – Federally listed endangered SE – California state listed endangered species SR - California state rare species SoC – species of concern (no legal protection, conservation concern at local, regional, or state level based on either valid and substantial scientific evidence, scientific publications, or resource agency policy) Data sources: Baye et al. 2000, CNPS 2001, Hickman 1993, www.efloras.org, and P. Baye, unpublished data			

public trails and potential boat launch sites near roads and other public access facilities (Table 3.7.2-1). In San Rafael Bay, Marin knotweed (*Polygonum marinense*) occurs in tidal salt marshes, but this species has become relatively widespread since it was first identified as a rare and sensitive plant. The taxonomic status, native status, and rarity of this plant are uncertain, as is its status as a sensitive species (Table 3.7.2-1).

One federally endangered plant, California sea-blite (*Suaeda californica*), has been reintroduced to several localities in the Central Bay, long after its original San Francisco Bay populations became regionally extinct. It has not spread from points of reintroduction in limited sandy high salt marsh and beach habitats, and none of its reintroduced localities are at feasible trailheads; they are generally within inaccessible, isolated, and protected marsh and beach habitats.

Pacific cordgrass (*Spartina foliosa*), a common species threatened only by hybridization with an introduced non-native cordgrass species, occurs in the Central Bay, but its hybrids (which are the object of a rapid regional eradication program; www.spartina.org) are currently more common. Thus, with the exception of northern salt marsh bird's-beak, the Central Bay generally has low potential for significant water trail impacts to sensitive plant species.

South San Francisco Bay

A few sensitive plant species have either persisted or regenerated in diked baylands and adjacent lowlands in South San Francisco Bay. A few large and important early historic or prehistoric (“old growth”) tidal marsh remnant vegetation stands persist in the South Bay at upper Newark Slough and outer Dumbarton Marsh (Newark), and the Laumeister Tract (Palo Alto).

Some sensitive plant species associated with alkali clay soils or vernal pools (and similar seasonal wetlands) do occur in the South Bay, but with one exception, these are highly unlikely to occur in areas that would be frequented by WT users, because they are located in areas with distinctive and localized soil conditions, such as the vernal pools in and near the Warm Springs Unit of the Don Edwards San Francisco Bay National Wildlife Refuge. The one exception is

Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*), a rare plant with weedy habits (abundant seed production, rapid dispersal, unstable populations capable of rapid increase or decrease, and affinity for sparse or disturbed vegetation). It may occur infrequently but unpredictably in disturbed clay soils, such as levees, some seasonal wetlands and weedy diked baylands. The federally endangered Contra Costa goldfields (*Lasthenia conjugens*), formerly reported from a San Francisco Bay shoreline locality, is now restricted to vernal pools in Fremont, remote from Bay shorelines.

San Pablo Bay

San Pablo Bay is richer in sensitive plant species in shoreline, marsh or Bay-edge habitats than the remainder of San Francisco Bay. It also has retained more early historic and prehistoric remnant tidal marshes than any other region of the Bay, including China Camp (San Rafael), Heerdt Marsh (Corte Madera), most of Petaluma Marsh, Whittell Marsh (Point Pinole) and Fagan Slough Ecological Reserve and other old marsh fragments in the Napa Marsh. Intact terrestrial soils and stream deltas also contact estuarine marshes in San Pablo Bay at multiple locations. These "old growth" and tidal marshes and their edges conserve important "hot spots" of high native plant diversity.

Two rare species of bird's-beak, northern salt marsh bird's-beak (*Cordylanthus maritimus* ssp. *palustris*) and soft bird's-beak (*C. mollis* ssp. *Mollis*) occur in San Pablo Bay, in addition to owl's-clover (*Castilleja ambigua*, subspecies undetermined). San Pablo Bay also supports sensitive but non-endangered plants of tidal marsh habitats such as San Joaquin spearscale (*Atriplex joaquiniana*), delta tule pea (*Lathyrus jepsonii* var. *jepsonii*), and Mason's lilaeopsis (*Lilaeopsis masonii*). Suisun Marsh aster (*Symphyotrichum lentum*) was historically widely distributed in the Napa-Sonoma marshes. It is reported from the vicinity of Fagan Slough, and it is likely to persist at other localities, where its detection may be masked by the related common aster (*Symphyotrichum chilense*). Some special-status plants, like Mason's lilaeopsis, may be locally common in San Pablo Bay, but are difficult to detect without careful surveys. The locations of some rare plants, like San Joaquin spearscale and Mason's lilaeopsis, are likely to change from year to year.

Suisun Marsh and Northern Contra Costa Shoreline

The brackish marshes of the eastern reaches of the Bay (Suisun Marsh, and the marsh and bay edge habitats along the northern Contra Costa shoreline, Martinez and east), support most of the rare plants found in San Pablo Bay, as well as additional special-status plants. Suisun Marsh retains a large fragment of relatively intact prehistoric tidal marsh around Rush Ranch and upper Hill Slough. The prehistoric tidal marshes around Rush Ranch support a high concentration of native plant species diversity, but substantial native plant species diversity is also widely distributed in the brackish tidal marshes of the eastern reaches of the Bay.

Suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*) is locally present in a few localities around Rush Ranch tidal marshes in Suisun Marsh, south of Fairfield. Bolander's water-hemlock (*Cicuta maculata* var. *bolanderi*), historically abundant and associated with Suisun Marsh thistle, has not been accurately reported from Suisun Marsh in many years; it may be extirpated. Contra Costa goldfields also occurs near Suisun Marsh in alkali vernal pools, but is not known to occur adjacent to navigable sloughs or bay edges. Mason's lilaeopsis and Suisun Marsh aster, among other special-status tidal marsh plants, are widely distributed in Suisun Marsh to the delta.

INVASIVE PLANTS OF TIDAL MARSHES AND ADJACENT BAYLANDS

Many non-native species have established in the Bay Area, but some spread rapidly into natural vegetation and become either excessively abundant, or dominate whole plant communities – sometimes displacing them entirely. It is this subset of highly invasive non-native plants, or wildland weeds, that are the principal concern for conservation of plant resources.

Table 3.7.2-2 presents a selected list of non-native plants that have either proven to be highly invasive, or threaten to become so, and that are found in Bay habitats. A complete list of invasive non-native species that often become dominant in Bay habitats (particularly on levees) would include widespread and long-established terrestrial weeds found throughout central California, such as fennel (*Foeniculum vulgare*), radish (*Raphanus sativa*), oats (*Avena sativa*), poison-hemlock (*Conium maculatum*), star-thistles (*Centaurea* spp.) and a large number of annual Mediterranean grasses (*Bromus* spp., *Hordeum* spp., *Phalaris aquatica*). (Bossard and Randall 2007; Bossard et al. 2000).

Other non-native plant species have “naturalized” in the Bay without dominating wetland zones or whole plant communities. These long-established naturalized non-native species include some that have in the past been assumed to be native (e.g., spearscale or fat-hen, *Atriplex prostrata*), or have been selected for management to benefit certain wildlife species (e.g., brass-buttons, *Cotula coronopifolia*, and spearscale).

A suite of non-native plant species, many of which are highly invasive, has established abundantly in salt marsh vegetation, including hybrid cordgrass and Mediterranean saltwort (*Salsola soda*). Invasive non-native salt marsh plants sometimes displace native salt marsh vegetation or other tidal habitats, such as estuarine beaches or mudflats. Until the 1990s, Pacific cordgrass (*Spartina foliosa*) generally composed the low salt marsh vegetation throughout salt marshes of the San Francisco Estuary, but cordgrass marshes in San Francisco Bay have recently been widely dominated by an invasive non-native hybrid cordgrass, *Spartina alterniflora* x *foliosa*. Marshes in San Pablo and Suisun Bays have remained relatively free of hybrid cordgrass. More recently, Mediterranean sea-lavender (*Limonium ramosissimum*) and European goosegrass (*Puccinellia maritima*) have invaded the bayshore marshes of the San Francisco Peninsula (P. Baye, unpublished data; Gavin Archbald pers. comm. 2009; Katharyn Boyer, pers. comm. 2009).

Invasive non-native plants of San Francisco Estuary wetlands, and their adjacent terrestrial habitats, are among the most important influences on habitat quality and conservation of native plant species diversity. Invasive non-native plants of tidal marshes and estuarine shorelines are dispersed by different processes, and at variable rates. Most long-distance dispersal of seeds is relatively infrequent: most studies of seed dispersal in tidal marshes and shoreline habitats show that most seeds disperse close to the “parent” or source plants, decreasing exponentially with distance. This pattern tends to remain true even for wind-dispersed or water-dispersed seed. Most tidal marsh plants are dispersed naturally by wind and water (Huiskes et al. 1995), but some may be dispersed by ingestion and excretion by wildlife, attachment to wildlife fur or feathers (Vivian-Smith, and Stiles 1994). The same physical seed adhesion features that make some tidal marsh plants susceptible to dispersal by wildlife provide potential for attachment to people

TABLE 3.7.2-2. SELECTED INVASIVE PLANTS OF TIDAL MARSHES AND ADJACENT BAYLANDS

Species	Regional Invasive Status	Ecology and Regional Distribution
<i>Agrostis avenacea</i> Australian bentgrass	Highly invasive; early rapid stages, recent surge of old introduction	High tidal marsh edges, nontidal seasonal brackish pools and wetlands of San Pablo Bay, northwestern San Francisco Bay, Suisun Marsh
<i>Carpobrotus edulis x chilensis</i> Iceplant	Highly invasive; late stages, very old introduction	Disturbed edges of levees, beaches, high tidal marsh; throughout region, but mostly western Bay
<i>Dittrichia graveolens</i> Mediterranean tarweed	Highly invasive, early stages, recent introduction	High tidal marsh edges, levee trail edges, roadsides, nontidal ruderal diked baylands and seasonal brackish wetlands of San Pablo Bay, San Francisco Bay; extremely rapid invasion northward and eastward in progress
<i>Ehrharta erecta</i> Tall veldtgrass	Highly invasive, early stages, recent surge of older introduction	Levee trail edges, roadsides, riparian woodland, upland borders of tidal marshes; San Rafael Bay to San Francisco Peninsula, Berkeley-Albany; spreading.
<i>Elytrigia pontica</i> Russian wheatgrass	Moderately to highly invasive, early stages, old introduction	Levees, high tidal marsh edges, sporadic throughout SF Bay: Palo Alto, Newark, Mare Island are known centers of abundance.
<i>Juncus gerardi</i> Black rush	Locally highly invasive; early stages, old introduction	Brackish high marsh, Southampton Marsh only Benicia and north Richmond
<i>Limonium ramosissimum</i> Algerian sea-lavender (two subspecies)	Highly invasive, very early stage of invasion, likely recent introduction	High tidal marsh edges, adjacent beaches, San Francisco to Foster City; local Richardson Bay
<i>Lepidium latifolium</i> Broadleaf pepperweed	Highly invasive, late stage, recent surge of older introduction	Brackish high tidal or nontidal marshes, levees, high tidal marsh edges. Entire range of Bay.
<i>Piptatherum mileaceum</i> Smilo grass	Moderately to highly invasive, early stages, old introduction	Levees, high tidal marsh edges, brackish high marsh, beaches, riparian woodland edges, San Francisco Bay
<i>Puccinellia maritima</i> European goosegrass	Moderately (to possibly highly?) invasive, early stages, unknown date of introduction	High tidal marsh edges, high salt or brackish tidal marsh plains. Burlingame to Foster City (possibly Bair Island)
<i>Salsola soda</i> Mediterranean saltwort	Highly invasive, late stage, recent surge of older introduction	High tide zone of beaches and tidal marsh plains. Entire range of SF Bay; concentrated in western Bay
<i>Spartina alterniflora x foliosa</i> Hybrid cordgrass	Highly invasive, recent surge of older introduction; eradication program in progress	Tidal salt or brackish marsh, low to high zones, Central and South San Francisco Bay and upper Petaluma Marsh
<i>Spartina densiflora</i> Chilean cordgrass	Highly invasive, recent surge of older introduction; eradication program in progress	High tidal salt or brackish marsh, San Rafael Bay (residual at Point Pinole)
<i>Spartina patens</i> Salt meadow cordgrass	Highly invasive (local), older introduction; eradication program in progress	High tidal brackish marsh, Southampton Marsh only (Benicia)
Data sources: Invasive Spartina Project (ISP 2001), P. Baye, unpublished data.		

(footwear, clothing with mud, sand, or seed adhering), vehicles (equipment or tires), or watercraft.

Patterns suggestive of large “leaps” in the range of some wetland weeds associated with motorized vessels have recently been observed near marinas and offloading facilities where disturbed substrates are present. For example, hybrid cordgrass (*Spartina alterniflora x foliosa*) recently extended its northern limit from the Central Bay to a large infestation in the vicinity of the Petaluma Marina and a nearby sand processing plant, with no colonies in between. Similarly, the center of abundance of Mediterranean tarweed (*Dittrichia graveolens*) in the North Bay in 2006 was the immediate vicinity of Port Sonoma. That species had previously been concentrated in South San Francisco Bay. The intensive recent invasion of high tide shorelines (high marsh, sand, rubble) by Algerian sea-lavender (*Limonium ramosissimum*) in western San Francisco Bay is closely associated with public access points, including main infestations at Coyote Point Marina’s shoreline, Burlingame Lagoon trail edges and adjacent marsh, and tidal marsh trail edges in Richardson Bay (Gavin Archibald, pers. comm. 2009; Katharyn Boyer, pers. comm. 2009).

3.7.3 LOCAL SETTING

The proximity of the 112 Backbone Sites to sensitive habitat and sensitive plant species varies, and would be evaluated carefully as part of the trailhead designation process. The distribution of sensitive habitats around the Bay is shown in Figure 3.7.2-1.

3.7.4 REGULATORY SETTING

Biological resources, including sensitive habitats and plants, are protected under several federal and state statutes. The regulatory setting information provided below addresses biological resources as a whole, and provides supplemental information pertaining to sensitive habitats and plants, where applicable. Local jurisdictions may impose additional protections; locally-applicable requirements would be evaluated during the trailhead designation process if a potential WT site is located in or near sensitive habitats or sensitive plants may be present in the vicinity of the site.

FEDERAL REGULATIONS AND PLANS

ENDANGERED SPECIES ACT

At least three Sections (Sections, 7, 9 and 10) of the Endangered Species Act of 1973, as amended (16 USC 1531; ESA), may be pertinent to the WT Plan. Section 7 of the ESA requires that federal agencies consult with the U.S. Fish and Wildlife Service (USFWS) for ESA-listed plants if a federal action, such as a permit, license, or federal funding, may affect an ESA-listed threatened or endangered species. Federal agencies are prohibited from taking actions that would be likely to jeopardize a federally listed endangered or threatened species. USFWS concludes consultations with either a formal biological opinion or a written determination that a federal action that may affect a listed species would not be likely to adversely affect it. For actions around the San Francisco Bay’s wetlands, Section 7 is often provided through the Corps permit process (see Federal Clean Water Act) or through the San Francisco Bay National Wildlife Refuges (USFWS) for actions within their jurisdictions.

Section 9 of the ESA concerns prohibited actions. For federally listed plants, Section 9 has limited prohibitions concerning malicious damage to listed plants under federal jurisdiction, or removal or damage of listed plants outside of federal jurisdiction when state laws regarding criminal trespass or plant protection are knowingly violated. Section 9 prohibitions are seldom triggered for plants.

Section 10 of the ESA provides for authorization of some “take” incidental to other actions. “Take” authorization may be provided in the form of a Habitat Conservation Plan (HCP), permits for research on recovery actions to benefit listed species, or “incidental take statements” that are included in many biological opinions prepared under Section 7.

CLEAN WATER ACT SECTION 404

Discharges of dredged or fill material into “waters of the United States,” including jurisdictional wetlands and all tidal waters around the San Francisco Estuary, are regulated by the Corps with oversight of the EPA. The Corps has jurisdiction over tidal wetlands, navigable waterways, and most wetlands and other waters adjacent to them (i.e., jurisdictional wetlands and other waters of diked baylands) under Section 404 of the Clean Water Act. The Corps has Section 404 jurisdiction over tidal wetlands up to the “High Tide Line”, and broader jurisdiction under Section 10 of the Rivers and Harbors Act of 1899 up to the Mean High Water line.

The Corps may authorize fill in jurisdictional wetlands and other waters by issuance of standard individual permits (with public notice and interagency coordination), general permits for authorized categories of regulated activities, including Nationwide Permits (no public notice is required; interagency coordination may be required), or letters of permission for certain categories of activity (no public notice is required). Corps and EPA regulations pertaining to Section 404 jurisdiction generally discourage or prohibit discharges of fill that would degrade or destroy the quality of wetlands or other waters. Corps permits may trigger Section 7 ESA consultation if the Corps determines that a permit action “may affect” a federally listed species. Corps permits in the baylands of the San Francisco Estuary generally require some state authorizations or certifications, including Section 401 water quality certification from the Regional Water Quality Control Board – San Francisco Bay Area (RWQCB), and BCDC authorization for activities within their jurisdiction.

EXECUTIVE ORDER 11990–PROTECTION OF WETLANDS

As described in Section 3.2, this Executive Order protects wetlands and requires that all federal agencies minimize the destruction, loss or degradation of wetlands, and preserve and enhance the natural and beneficial values of wetlands. Corps permits are subject to the policies of Executive Order 11990, which applies to federal projects or actions such as leases affecting wetlands.

COMPREHENSIVE CONSERVATION PLANS

A Comprehensive Conservation Plan (CCP) is being prepared for the San Pablo Bay National Wildlife Refuge (NWR) and is expected to be finished in 2010. CCPs comply with standards outlined in NEPA and provide National Wildlife Refuges with guidance for management decisions. A CCP for Don Edwards NWR is expected to be finished in 2012.

STATE REGULATIONS

CALIFORNIA ENDANGERED SPECIES ACT (FISH AND GAME CODE SECTION 2050 ET SEQ.)

The state equivalent of the Federal ESA, CESA has similar but distinct requirements and goals. CESA requires state agencies to coordinate with the CDFG to ensure that state-authorized or state-funded actions do not jeopardize a state-listed species. The state list of species classified as rare, threatened, or endangered does not correspond identically with the federal list of threatened and endangered species. CESA prohibits unauthorized “take” of a state-listed species.

CALIFORNIA NATIVE PLANT PROTECTION ACT (FISH AND GAME CODE SECTION 1900 ET SEQ.)

In addition to CESA, the NPPA protects endangered and “rare” species, subspecies, and varieties of native California plants. The species listed under this law, which preceded CESA, now overlap with those of CESA. NPPA contains many exemptions for agriculture and forestry, and many exceptions, but it otherwise generally prohibits unauthorized “take” of listed plants. NPPA contains “notice and salvage” provisions that require landowners to notify CDFG to “salvage” (rescue by transplanting – a technique no longer generally scientifically supported) listed plants in the path of land-clearing or development activities. In other words, plants may be moved, but not destroyed.

PORTER-COLOGNE WATER QUALITY CONTROL ACT

Biological “beneficial uses” of state waters are subject to regulation under the Porter-Cologne Water Quality Act through various means, including mandatory conditions attached to state water quality certification of Federal Clean Water Act (Sections 401, 404) authorizations and waste discharge permits. The Regional Water Quality Control Boards frequently provide Porter-Cologne compliance with wetland beneficial use policies by attaching mandatory conditions to Section 401 certifications for Corps permits for fill discharges in federal jurisdictional wetlands.

EXECUTIVE ORDER W-59-93, CALIFORNIA WETLANDS CONSERVATION POLICY

This state policy established by the Governor of California in 1993 provides substantive environmental goals to ensure no overall net loss of wetlands, to achieve a long-term net gain in the quantity, quality, and permanence of wetlands in California, with due concern for private property and stewardship.

LOCAL AND REGIONAL REGULATIONS AND PLANS

MCATEER-PETRIS ACT AND THE SAN FRANCISCO BAY PLAN

The McAteer-Petris Act (Act) requires that individuals and organizations obtain permits to fill, extract materials, and make substantial changes in use of land, water or existing structures in the Bay. In determining whether to issue permits, BCDC looks to policies set forth in the McAteer-Petris Act and in the *San Francisco Bay Plan*. In general, these policies authorize fill or excavation of wetlands only for water-dependent projects where no feasible upland alternatives exist, and only if wetlands impacts are mitigated.

The *San Francisco Bay Plan* includes policies to protect wetlands from poor water quality, dredging, and other activities (BCDC 2007a, as amended).

Three policies from the Bay Plan may be directly applicable to the WT. They are specific to tidal marsh and tidal flats, and are found in Part III: The Bay as Resource: Findings and Policies, in the subpart entitled “Tidal Marshes and Tidal Flats – Findings and Policies Concerning Tidal Marshes and Tidal Flats Around the Bay. Policies 1 through 3 from this subpart are as follows:

1. Tidal marshes and tidal flats should be conserved to the fullest possible extent. Filling, diking, and dredging projects that would substantially harm tidal marshes or tidal flats should be allowed only for purposes that provide substantial public benefits and only if there is no feasible alternative.
2. Any proposed fill, diking, or dredging project should be thoroughly evaluated to determine the effect of the project on tidal marshes and tidal flats, and designed to minimize, and if feasible, avoid any harmful effects.
3. Projects should be sited and designed to avoid, or if avoidance is infeasible, minimize adverse impacts on any transition zone present between tidal and upland habitats. Where a transition zone does not exist and it is feasible and ecologically appropriate, shoreline projects should be designed to provide a transition zone between tidal and upland habitats.

Several other policies govern restoration of tidal marshes and tidal flats, and would apply to any WT sites where habitat restoration is proposed as part of a trailhead plan. In addition, BCDC’s policies also state that “The use of non-native plant species in public access landscape improvements should be avoided where a potential exists for non-native plants to spread into the Bay, other waterways, or transition zones between tidal and upland habitats.” (Policy 6 of the Tidal Marshes and Tidal Flats Findings and Policies).

3.7.5 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The level of significance of biological impacts to vegetation is determined partly by regulatory requirements, and partly by the scientific literature on ecology, conservation biology, and related environmental sciences. Potential impacts to vegetation resources associated with implementation of the WT Plan would be considered significant if they would:

- Have a substantial adverse effect, either directly or indirectly through habitat modifications, on any plant species identified as candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game, or U.S. Fish and Wildlife Service. A substantial adverse effect would occur if the project would:
 - Extirpate (cause local extinction of) a population
 - Cause or contribute to a substantial decrease in the distribution (range) or abundance of a sensitive or special status species, substantially diminish or degrade habitat for such a species, reduce a species’ regeneration capacity in existing or historic range(s), or otherwise reduce the viability of a sensitive or special-status plant species
 - Cause or contribute to a substantial increase in the “invasion pressure” of suitable habitat of a sensitive plant species by invasive non-native plants

- Have a substantial adverse effect on any wetland or riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game, or U.S. Fish and Wildlife Service. A substantial adverse affect would occur if the project would:
 - Cause the loss or substantial reduction in area or distribution of a unique or rare plant community
 - Cause substantial loss of composition or structure in a plant community that is very old or mature, and very slow or uncertain to regenerate over many human generations
 - Lead to a major increase in the distribution, rate of spread, abundance, or impact of an invasive non-native species
 - Result in major, long-term reduction in diversity of native species and communities

METHODOLOGY

The evaluation of impacts to biological resources is based on a number of factors: potential proximity of a WT trailhead or WT users to a resource, the sensitivity of that resource to disturbance, and temporal/spatial patterns of both disturbance and resource sensitivity. Primary stressors to sensitive plants and sensitive habitats were first identified. These include actions that could degrade the habitat occupied by sensitive plants, and other direct and indirect damage to sensitive plants. The potential for implementation of the WT to lead to these effects was then evaluated.

REGIONAL IMPACTS AND MITIGATION MEASURES

IMPACT BIO-1: SPREAD OF NON-NATIVE INVASIVE PLANTS

Non-native invasive plants can adversely affect sensitive habitats and sensitive plant species by displacing (out-competing) the native plants. WT activities could potentially facilitate non-native plant invasions in several ways, including weed seed dispersal and habitat disturbances that would favor the establishment of new “outlier” populations of weeds.

Some patterns of estuary weed spread appear to track human activity, such as levee maintenance, localized dredging and grading, or shoreline access points with high traffic (marinas, boat launches, trail entrances, parking lot edges, etc.) (Baye 2000b). Long-distance dispersal events (the definition of “long-distance” depends on the species and the dispersal mechanism) are especially significant for weeds in early stages of regional spread. New “outposts,” or weed founder populations, could create new centers of spread remote from core populations or points of origin.

Generally, widespread wetland and terrestrial weeds have already “saturated” the Estuary as mature invasions. Low levels of additional seed dispersal would normally have little effect on invasion rates of common, widespread weeds in sensitive vegetation. While these weeds may locally erupt in abundance in response to localized disturbances, and may circumstantially cause adverse impacts to native plants, they are generally a less significant risk to biological diversity than recent, early-stage, aggressive invasions. These older, “naturalized” non-native species have

been considered in terms of WT activities or projects and their potential influence on weed invasions, but would not pose a potentially significant impact by themselves.

In contrast, the invasive species listed in Table 3.7.2-2 are in various stages of invasion in Bay habitats, and their regional invasions are likely to be limited by seed dispersal in many parts of the Bay. Thus, low levels of additional seed dispersal across geographic or ecological barriers may have significant effects on the geographic range (expansion), location, or rate of weed invasion of these species. Of the 14 species listed in Table 3.7.2-2, one (Mediterranean tarweed) has a very high potential for increased spread due to implementation of the WT; six others have a moderate-to-high or high potential (Australian bentgrass; tall veldtgrass, Algerian sea-lavender, Smilo grass, hybrid cordgrass, and Chilean cordgrass).

WT users visiting more than one WT site, either during one outing or successive outings, could become significant vectors for colonization by invasive plants in early stages of regional spread by creating new outposts of weeds beyond of the normal geographical range of wind- and water-driven seed dispersal patterns. Weed seed dispersal associated with the use of NMSBs may occur through mud or sand attached to footwear, boating equipment, or fabric (clothing or packs). NMSBs and NMSB users may come into frequent contact with sediment (mud, sand) that may contain seeds of wetland weeds. NMSBs can also navigate shallow sloughs in remote, inaccessible, sensitive tidal wetlands and therefore could facilitate the spread of invasive species to and from these areas. Seeds could also be transported in soils on tires or car bodies, and could colonize disturbed roadside substrate (weed seedling habitat) in or around parking lots.

The risk of significantly elevated impacts of weed seed dispersal and weed spread would depend on the frequency of NMSB use, trailhead location, and the regional setting. Any appreciable increase in the public use of multiple WT sites (increased probability of users visiting multiple individual sites because of the regional network of shoreline access within the WT system, and/or publicity about sites previously unknown to users) could increase the potential for the spread of invasive marsh or shoreline weeds. The potential impact of the WT on the spread of invasive plants would likely be less than significant for most trailheads in urbanized sites in the Central Bay (outside of Marin County). This impact could be **potentially significant but mitigable** in less urbanized parts of the Bay. Impact Bio-1 would be reduced to a less than significant level by implementation of the following measures.

MITIGATION MEASURE BIO-M1: CONDUCT EDUCATION AND SPREAD-REDUCTION EFFORTS

Educational materials shall be provided to educate all WT users about the potential for spread of invasive plant species through WT activities, and methods that WT users can employ to minimize this potential, such as cleaning NMSBs and associated equipment/clothing prior to leaving trailheads (removal of sediment or adhering debris potentially containing weed seeds), or, if not practical at the site, prior to using the equipment and other items at another location.

- The trailhead designation process for all WT sites near either sensitive or invasive plant species habitat shall include a determination of whether information about spread-reduction should be incorporated into signage for the site, and shall require the inclusion of such language if warranted.
- Site owners shall take steps to minimize boat and foot traffic trampling on vegetation (including local weed populations) at trailheads as described in Mitigation Bio-M3, below.

SITE-SPECIFIC IMPACTS AND MITIGATION MEASURES

IMPACT BIO-2: WETLAND HABITAT IMPACTS DUE TO CONSTRUCTION, REPAIR, REHABILITATION, OR MAINTENANCE OF TRAILHEADS

WT activities may include construction, repair, rehabilitation, or maintenance of facilities in or adjacent to wetland habitats, including boat ramps or other WT improvement infrastructure (which does not typically require locations in wetland habitats). For HOSs, these activities would be minimal (i.e., construction would be limited to signage only).

WT strategies (Strategies 1, 3, and 4) would guide WT improvements away from sensitive wetland habitats to the greatest extent feasible. If site-specific constraints make wetland avoidance infeasible at a trailhead, trailhead improvements, rehabilitation, repair, or maintenance may result in unavoidable fill in wetland habitats. Any such fill would be permitted and constructed in accordance with all applicable regulations.

Ordinarily, small wetland fills or other wetland impacts associated with boat launching ramps and small trailhead facilities would not be expected to have significant impacts in most urban wetland settings. In addition, signage or other minor improvements to HOSs are unlikely to adversely affect wetlands. Nevertheless, in some potential non-HOS trailhead locations, depending on the environmental sensitivity of the wetland areas affected, and the environmental sensitivity of special-status wildlife and plants in the vicinity, small wetland fills could result in significant direct or indirect impacts to wetlands. This impact is considered **potentially significant but mitigable**. With implementation of mitigation measure Bio-M2 this impact would be reduced to a less than significant level.

MITIGATION MEASURE BIO-M2: CONDUCT SURVEYS, ADOPT AVOIDANCE MEASURES, AND INSTIGATE COMPENSATORY MITIGATION

Existing regulations and policies require consideration and protection of wetlands that may be affected by construction activities, and/or implementation of compensatory mitigation if impacts to wetlands are unavoidable. The WT will be implemented consistent with these regulations, by following the key steps below:

- Trailhead Plans for non-HOS WT sites shall assess whether wetlands or sensitive vegetation occur on the site.
- If areas are present that may be regulated as wetlands, and these areas cannot be avoided through proper staging of construction activities, owners/managers shall complete pre-construction surveys by qualified biologists to determine the distribution of wetlands and characterize the vegetation present within the vicinity of potential construction, repair, or maintenance footprints (effect areas).
- If surveys determine that wetlands habitat is present at or near a trailhead site, project plans for construction, repair, or rehabilitation of trailhead facilities, including configuration of facilities, shall be designed to avoid or minimize impacts to wetlands to the extent feasible.
- Biological surveys shall include special-status plant species surveys that comply with California Native Plant Society and CDFG guidelines or protocols for rare plant survey methodology.

- If wetland impact avoidance is not feasible, WT site owners/managers shall prepare and implement plans to compensate for unavoidable wetland impacts, consistent with regulatory requirements and technical advice from state and federal resource agencies.

IMPACT BIO-3: WETLAND HABITAT IMPACTS DUE TO INCREASED TRAMPLING OF WETLAND SHORELINE VEGETATION AND SOIL

Although most WT trailheads would be located in urbanized areas and in marinas or other developed facilities, some trailheads would be in relatively undeveloped open space areas in or adjacent to wetland shoreline vegetation. Well-designed boat launching ramps would reduce potential impacts to the environment. Nonetheless, in non-urbanized and undeveloped areas, facility modifications or increased use due to WT publicity could lead to locally increased trampling of vegetation that could gradually eliminate native vegetation, increase exposure to erosional forces, or create vegetation gaps.

Trampling could also occur as a result of informal trails, or boaters making unplanned or unauthorized landings outside of WT-designated trailheads or destination sites because they are experiencing distress during trips, or seeking views from levees. Trampled, matted vegetation, if visible, may be attractive for subsequent landings by other boaters.

Trampling effects on vegetation may in some cases be neutral or benign. At intermediate levels of trampling intensity, trampling may create small vegetation gaps that may provide habitat for seedlings of native marsh or beach plants, including some special-status plant species that specialize in colonizing gaps or sparse vegetation. However, vegetation gaps could also facilitate non-native plant invasions.

Salt marsh vegetation types affect the potential for landings and marsh access by small craft. Slough banks in salt marshes are usually lined with either moderate to gently sloped mud beds with cordgrass vegetation, or steep, nearly vertical, erosional banks (slumps and scarps). Different vegetation types vary in their sensitivity to trampling. Cordgrass vegetation is sensitive to trampling, and crushes easily. Pacific cordgrass roots and rhizomes (horizontal below-ground stems) only loosely bind soft mud. Pacific cordgrass roots and rhizome meshes are usually not strong enough to resist the shear forces of human trampling, which tends to gouge into underlying mud. In contrast, non-native hybrid cordgrass vegetation is usually dense and very tall (resisting visual access or boat landings), but it also provides better footing by binding salt marsh soil more strongly. Mature pickleweed marsh also forms firm ground and solid footing, and also maintains short vegetation. Steep slumped banks restrict landings by small boats at lower tidal stages, but may allow potential landings on firm pickleweed marsh at high tide. Because tule and bulrush marsh vegetation along sloughs of tidal brackish marshes is very tall and dense, it makes views of adjacent marsh plains and access to them from small craft (landings) difficult.

Trampling impacts associated with the WT would be due to NMSB users either trying to get more direct access to the shore, or to approach visually appealing areas from the water. Thus, any WT-related trample paths would all connect to the water, and paths that do not lead to the water would not be due to NMSB use. Most trampling impacts in vegetation around intensive urban shorelines would ordinarily be less than significant because sensitive habitat or plants

would not be present. Similarly, at most HOSs, which include already developed facilities and where the project is not expected to generate substantial new use, this impact would be less than significant. However, in areas with sensitive shoreline wetlands and a significant increase in use, this impact would be **potentially significant but mitigable**. With implementation of mitigation measure Bio-M3, this impact would be reduced to a less than significant level.

MITIGATION MEASURE BIO-M3: ESTABLISH TRAILHEAD RESTRICTIONS, PUBLIC EDUCATION, SURVEYS, AND SIGNAGE

As described in Mitigation Measure Bio-M2, Trailhead Plans for non-HOSs shall consider whether sensitive wetland vegetation occurs at or in the vicinity of proposed trailheads (the precise distance that is of potential concern will vary based on site-specific factors such as typical travel patterns, other features in the area, etc.). If sensitive wetland vegetation is present at or within the vicinity of a potential trailhead, the following measures shall be incorporated into the trailhead designation process.

1. WT staff shall prepare and effectively publicize guidance to discourage landings along vegetated wetland banks of sloughs or establishment of unauthorized landings.
2. Foot traffic and boat contact with wetland weeds or native wetland vegetation shall be minimized at trailheads through proper access route and boat launch area design, to make accessing the water along designated routes more attractive than entering sensitive habitat.
3. Trailhead owners/managers shall annually inspect trailhead locations for the development of new informal trail networks emanating from trailheads. If new informal trails extend into wetlands or other native shoreline vegetation, they shall be closed by placement of symbolic fencing and signage restricting access across vegetation.
4. Trailhead owner/operators shall track the use patterns at their location, and if there is a notable increase in use, they shall conduct periodic (annual or biennial) boat surveys to detect and locate trampling impacts in native or non-native wetland vegetation along sloughs or shoreline vegetation in the vicinity of trailheads. Surveys may be conducted by trailhead stewards, other volunteers, or the site owner/operator. If trampling impacts (incipient unauthorized landings) are detected in wetland vegetation along sloughs or shoreline vegetation in the immediate vicinity of trailheads, trailhead managers shall take feasible actions to close the incipient landings by placing signage or otherwise discouraging or prohibiting landings at trampling-impacted slough bank or shoreline locations.

IMPACT BIO-4: IMPACTS TO SPECIAL-STATUS WETLAND PLANT SPECIES

A large proportion of WT Plan Backbone trailheads would be located in urbanized settings such as waterfront parks, marinas, and developed access areas that are distant from locations of special status plant populations, particularly in South San Francisco Bay and most of the Central Bay outside of Marin County. The likelihood of significant impacts to sensitive plant species is expected to be low for the majority of urban-edge trailheads where armored, engineered shorelines with narrow, young, fringing marshes or no fringing vegetation are prevalent. Most NMSB trips from such sites would also be unlikely to contact sensitive plant populations or habitats.

At trailhead locations in Richardson Bay, San Rafael Bay, San Pablo Bay, Suisun Marsh, and the northern Contra Costa shoreline, however, impacts to special-status plant species could occur. Potentially significant impacts to special status plant species at sites in these locations could occur through increased use of trailheads, or through construction or maintenance of WT trailhead facilities. Activities that may directly or indirectly impact special-status plant species may include trampling, competition with non-native vegetation, erosion control activities, placement of fill, and management of nuisance vegetation.

Trampling of sensitive plant populations, or the habitats in which they regenerate (such as seedling habitats), is described in Impact Bio-3 above. Impacts to special-status plants could also occur away from WT trailheads, due to trampling by NMSB users making emergency landings or seeking to enter a habitat area on foot. Competition or other interference effects of non-native invasive plants may adversely impact special-status plants. Erosion control activities may impact sensitive plant species that typically occur in erosional sub-habitats (e.g., Mason's lilaepsis). Placement of fill for construction of trailhead facilities in diked Bay vegetation could impact special-status plant species where they occur. Management of nuisance vegetation (such as brush removal, mowing, weed control, or vegetation clearing for improved public access) could potentially damage or destroy sensitive plant populations.

At most sites, including all sites meeting HOS criteria, application of WT Strategies 1, 3, and 4 as well as the educational and outreach provided for by Strategies 17, 18, 19, 21, and 22, would be expected to avoid or minimize potential impacts to special-status plant species. However, at sites at or near occurrences of special status plant species, this impact would be **potentially significant but mitigable**. With implementation of mitigation measure Bio-M4, this potential impact would be less than significant.

MITIGATION MEASURE BIO-M4: CONDUCT SURVEYS, ADOPT AVOIDANCE MEASURES, AND INSTIGATE COMPENSATORY MITIGATION

The trailhead designation process for sites that do not meet HOS criteria shall consider the potential for special status plant species to occur on or near the site. If special status plant species potentially occur at or adjacent to proposed trailheads, and these areas cannot be avoided through proper design and staging of construction activities, owners/managers shall complete pre-construction surveys by qualified biologists to determine if any special-status plant species are present within the vicinity of potential construction, repair, or maintenance footprints (effect areas). Biological surveys shall include special-status plant species surveys that comply with California Native Plant Society and CDFG guidelines or protocols for rare plant survey methodology.

If special status plant species impact avoidance is not feasible, trailhead owners/managers shall prepare and implement plans to compensate for unavoidable wetland impacts, consistent with regulatory requirements and technical advice from state and federal resource agencies as appropriate.

Mitigation Measures Bio-M1 and Bio-M3, above, also would apply to this impact.

3.8 BIOLOGICAL RESOURCES – BIRDS

This section discusses the existing sensitive avian resources of San Francisco Bay that could be affected by project-related construction and increased NMSB use resulting from implementation of the WT Plan, identifies potential impacts to those resources, and identifies mitigation measures to reduce or eliminate those impacts.

3.8.1 INITIAL STUDY FINDINGS

The Initial Study (IS) for this project identified potentially significant impacts on sensitive species. The IS also identified potential conflicts with Habitat Conservation Plans, other approved conservation plans, and local ordinances protecting biological resources. Migratory and resident birds were identified as sensitive species in the IS.

Two categories of birds are evaluated in this section: waterbirds and sensitive/special-status birds, including terrestrial species that occur near shorelines (e.g., burrowing owl [*Athene cunicularia*]). Potential impacts to birds were evaluated in the context of the San Francisco Bay area as a whole, and specific sensitive habitats.

3.8.2 REGIONAL SETTING

This section first describes the types of birds considered in this evaluation, and then discusses population trends, including potential factors contributing to the population trends.

WATERBIRDS

San Francisco Bay is an important local, national, and international resource for waterbirds. The term *waterbirds* refers to avian species that are primarily dependent upon aquatic or wetland habitats for their survival. Sensitive (also known as special-status) birds are a subgroup of waterbirds that have been listed or are proposed for listing as threatened or endangered under the federal or California Endangered Species Acts; that are listed as California Bird Species of Special Concern (BSSC) by the California Department of Fish and Game (CDFG); or that are otherwise included on the CDFG's list of special animals.

Open water, tidal marsh, tidal flats/mudflats, salt evaporation ponds, and diked wetlands are all habitat types that are important for waterbirds (Bollman et al. 1970, Takekawa et al. 2001). All of these habitats can be presently found within the Bay, although the modification of the Bay ecological conditions since European settlement has been extensive. Despite these changes, the Bay still provides the most important complex of wetland habitat for migratory and wintering waterbirds on the Pacific Coast (Goals Project 1999, 2000).

Ongoing surveys have shown that the Bay provides wintering habitat for more than 50 percent of the diving ducks on the Pacific Flyway (Takekawa et al. 2000, USFWS unpubl. data), and provides habitat for more than 500,000 individuals annually (Bildstein et al. 1991, Page et al. 1999). San Francisco Bay has been recognized as a Western Hemisphere Shorebird Reserve Network site of international importance (Bildstein et al. 1991, Harrington and Perry 1995).

WATERBIRD USE OF SAN FRANCISCO ESTUARY: SEASONALITY AND ABUNDANCE

The season of peak use for all waterbirds combined is November through mid-March (Takekawa et al. 2000, Avocet Research Associates 2009); however, timing is highly variable year-to-year

and some species may peak in abundance in early October or late March. The vast majority of rafting waterbirds occur in the Bay during their non-breeding season, arriving to spend the winter in mid-October and departing by the end of April. Small, long-distance migrant shorebirds (e.g., western sandpipers [*Calidris mauri*]) tend to reach peak numbers during migratory pulses in late April (Stenzel et al. 2002). The distribution of waterbirds within the Estuary's waters is well documented for most species that over-winter and for all local colonial nesters (e.g., cormorants, egrets and herons) or special-status species (e.g., western snowy plover [*Charadrius alexandrinus nivosus*]).

Although winter is the season of maximum waterbird abundance, the Estuary also provides habitat in spring and summer for breeding populations of herons and egrets (Kelly et al. 2006), gulls and terns (Goals Project 2000), cormorants (Ainley 2000, Stenzel et al. 1995), and waterfowl (especially in managed wetlands of Suisun marsh) (Goals Project 2000), as well as several threatened and endangered waterbird species: the federally endangered California clapper rail (*Rallus longirostris obsoletus*) and California least tern (*Sterna antillarum browni*), federally threatened western snowy plover, and the state threatened California black rail (*Laterallus jamaicensis coturniculus*). San Francisco Bay is the singular refuge of the California clapper rail (Albertson and Evens 2000) and supports an estimated 90 percent of the California black rail population (Trulio and Evens 2000).

Waterbirds can be broken down into different categories based on their habitat preferences and use patterns. These categories are often referred to as *guilds*. The habitat preferences and use patterns associated with the different guilds result in different potential impacts associated with the WT. The following guilds are discussed in this EIR:

- **Waterfowl.** This term is used to describe dabbling and diving ducks, geese, grebes, and their allies. Waterfowl primarily depend on open water habitats for foraging and roosting and wetland/upland habitats for breeding.
- **Shorebirds.** This guild includes sandpipers, plovers, and allies that primarily utilize beach, mudflat, salt pond, or shallow open-water habitats for foraging and roosting. This guild generally nests on beaches and upland areas.
- **Wading Birds.** This guild includes egrets, herons, and night herons that utilize emergent marsh, marsh edge, and shallow open water habitats. These birds generally do not breed inside marshes, instead forming nesting colonies in trees.
- **Gulls.** Although this guild includes many species of gulls, California gulls (*Larus californicus*) are the sole species discussed in this EIR.
- **Marsh birds.** For purposes of this EIR, this guild includes species in a wide range of genera, such as rails and certain passerines, that are dependent upon emergent marshes for most or all of their life stages.

Specific information for the birds making up each of these five major guilds is provided below.

WATERFOWL

Waterfowl are typically divided into two major subgroups: dabbling waterfowl (surface feeders) and diving waterfowl.

Dabblers

Dabblers accounted for less than four percent of open water birds in USFWS aerial surveys of San Francisco Bay over 17 years (1990-2007, USFWS unpublished data). Most dabblers are found on salt ponds (Takekawa et al. 2001, USFWS unpubl. data). Dabblers on open Bay waters are typically observed in shallow water less than one meter (m) deep and on tidal flats (Accurso 1992). Because they are sensitive to salinity values and water depth, large flocks of dabblers move onto the open Bay sporadically (e.g., when runoff from winter storms freshens the system). The most common dabblers in the Estuary are Northern pintail (*Anas acuta*), Northern shoveler (*Anas clypeata*), and American wigeon (*Anas americana*).

Diving Waterfowl

Diving waterfowl include diving ducks, double-crested cormorants (*Phalacrocorax auritus*), and pelicans. Percentages of each species vary widely based on seasonality and interannual fluctuations. For example, cormorants comprise a significant percentage during summer months when virtually all other divers are absent from the bay but a rather small percentage when wintering divers are present. Divers tend to gather in rather large flocks (rafts) and concentrate at the mouths of larger tributaries and in leeward bays and coves, especially during stormy conditions. Under calmer conditions, rafts may move out into deeper Bay waters. The common divers are distributed according to water depths, but because species often occur in mixed flocks, there is substantial overlap. Based on the cumulative results of the USFWS aerial surveys for all areas of the Bay (Table 3.8.2-1), overall 55 percent (33-72 percent) of waterfowl were on open water, and 45 percent were on salt ponds. Of the waterfowl on open water in the four regions of the Bay on USFWS aerial surveys, the vast majority were diving ducks.³³ Figure 3.8.2-1 shows the distribution of rafting birds on the Bay as reported in the Goals Project (Goals Project 2000).

Diving ducks are the most common of 20 species of open Bay waterbirds, comprising 78 percent of all waterfowl (USFWS unpubl. data). The open waters of San Francisco and San Pablo Bays are especially important to the most common waterfowl species groups—scaup (*Aythya marila* and *A. affinis*) and surf scoter (*Melanitta perspicillata*). Significant proportions of wintering populations of canvasback (*Anas valisineria*), ruddy duck (*Oxyura jamaicensis*), and bufflehead (*Bucephala albeola*) are also supported by Bay waters.

San Francisco Bay is one of the three largest wintering habitats for canvasback in North America with San Pablo and Suisun Bays providing especially important sub-regions for this species (Takekawa and Marn 2000). On average over a 45-year period (1955-1999), San Francisco and San Pablo Bays supported 46 percent of scaup, 44 percent of canvasback, and 24 percent of scoters on the Pacific Flyway (Kessel et al. 2002, Mowbray 2002, Savard et al. 1998, USFWS unpubl. data).

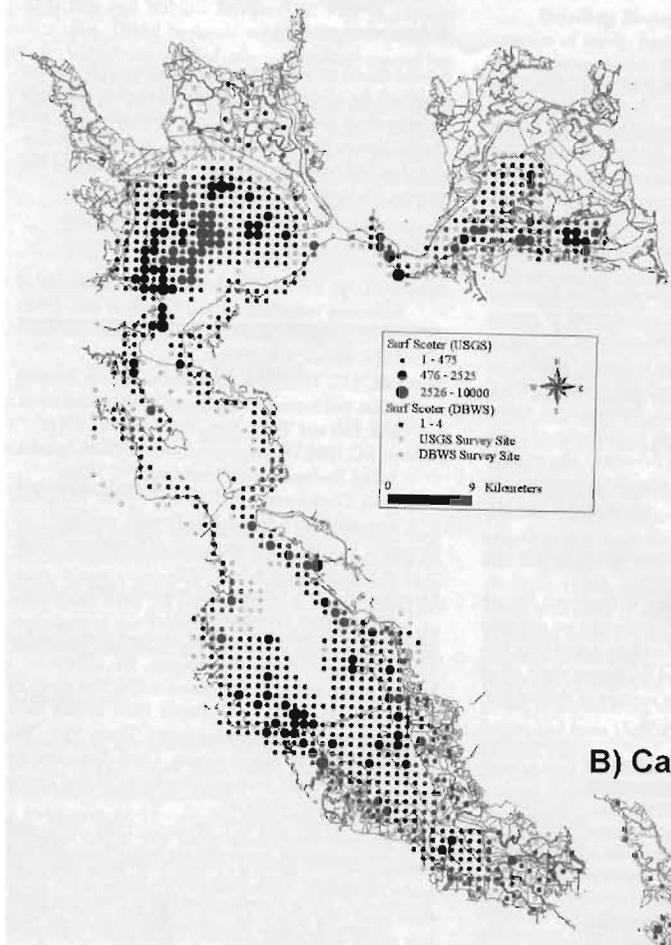
Scaup are most abundant in areas with water depths of 0.1 to 6 m, and scoter are evenly distributed across water depths, including deeper waters (more than 10 m), whereas canvasback and ruddy duck preferentially selected shallower waters less than two meters deep (Accurso 1992). Canvasback, ruddy duck, and bufflehead occur in much higher densities in diked baylands and salt ponds than on open Bay in winter and spring (Takekawa et al. 2001).

³³ <http://www.sfbayjv.org/pdfs/strategy/095-096-ApxC.pdf>

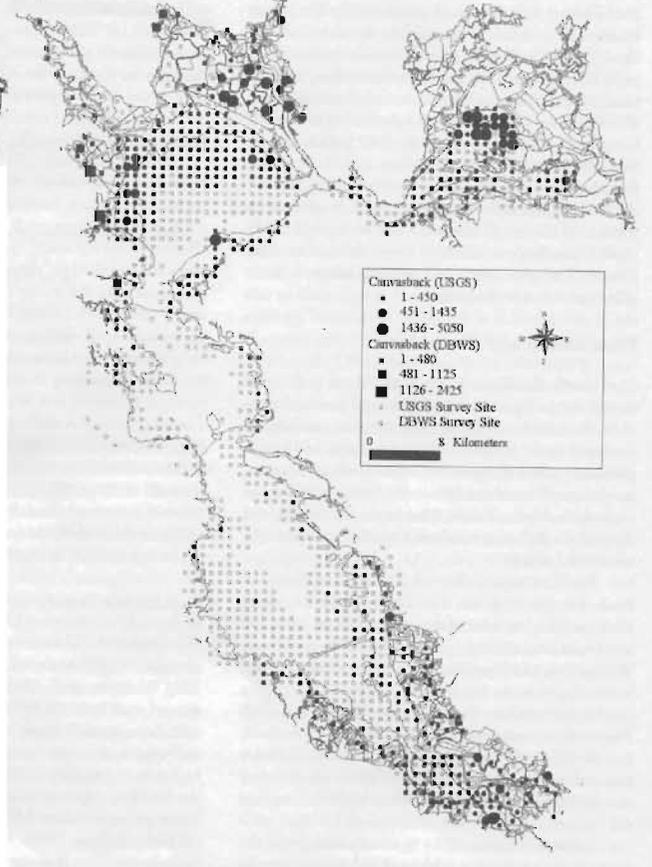
**TABLE 3.8.2-1. RESULTS OF USFWS AERIAL MIDWINTER WATERFOWL SURVEYS,
1990-2007 (EXCLUDING 1996)**

Year	Total Number	Percentage on Open Bay	Percentage North Bay	Percentage South Bay	Percentage Central Bay
1990	252,276	72%	55%	16%	29%
1991	264,155	63%	61%	14%	25%
1992	229,907	75%	34%	26%	40%
1993	117,947	55%	14%	57%	29%
1994	191,887	62%	11%	40%	49%
1995	89,863	34%	4%	14%	82%
1997	114,335	73%	59%	26%	15%
1998	207,884	60%	24%	47%	29%
1999	262,170	74%	38%	14%	49%
2000	169,950	64%	38%	36%	26%
2001	347,889	75%	20%	46%	34%
2002	175,292	33%	27%	30%	44%
2003	143,600	28%	25%	33%	42%
2004	176,428	47%	30%	33%	37%
2005	189,168	42%	17%	30%	54%
2006	132,529	36%	19%	40%	41%
2007	193,422	33%	52%	16%	32%
ALL YEARS	3,258,702	55%	31%	31%	39%

A) Surf Scoters



B) Canvasback



**Figure 3.8.2-1:
Maximum Counts of
Rafting Birds**

Images from Goals Report (2000)



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Although winter is the period of maximum abundance, diving waterfowl occur in the Bay in the summer months as well. The double-crested cormorant (*Phalacrocorax auritus*) nests in San Francisco and San Pablo Bays and is a year-round resident. Cormorants gather in large flocks on the water to forage and also roost on off-shore rocks, jetties, and pilings. Large flocks of cormorants also feed on the mid-winter herring spawn in eelgrass (*Zostera marina*) beds. Double-crested cormorant is considered a sensitive species.

California brown pelicans (*Pelecanus occidentalis californicus*) also occur in summer, arriving here most commonly in April and May and remaining through fall, with most departing for the breeding grounds to the south by late December. California brown pelicans are considered a sensitive species, being listed as Fully Protected by the CDFG, although the species was removed from the federal endangered species list on December 17, 2009, and the California Fish and Game Commission voted to remove the species from the state endangered species list on February 5, 2009. Under the federal Endangered Species Act, monitoring of the species' populations will continue for a period of five years after the date of federal delisting to determine the stability of populations. Traditional roosting sites have important habitat value to both pelicans and cormorants, and are prone to disturbance because many roosting sites are man-made structures (pilings, docks, seawalls, etc.) that are frequently visited by humans and are often fairly close to human activity such as fishing and boating. Some roosting sites are free of disturbance (e.g., the north end of Alcatraz Island) because they are designated as such by USFWS and human intrusion is forbidden.

SHOREBIRDS

In all seasons, the San Francisco Bay Estuary holds more total shorebirds than any other wetland in the conterminous U.S. Pacific coast (Stenzel et al. 2002). Shorebirds forage primarily on tidal flats and roost in adjacent diked wetlands, tidal marshes, and on unvegetated levees and islands during periods of tidal flooding. Most species groups tend to concentrate in greater proportion, relative to the extent of tidal flats, either in the geographic center of the Estuary or in the southern regions of the Estuary (Stenzel et al. 2002). Of 38 species recorded in Stenzel et al. (2002), 23 species occurred in fall, winter, and spring surveys and eight species were considered abundant (10,000 - 500,000+ individuals). Numbers reach their peak during the migratory period, which is protracted in the fall (August-October), but rather abrupt in the spring (April). Locally abundant nesting shorebirds – American avocet (*Recurvirostra americana*) and black-necked stilt (*Himantopus mexicanus*) – are primarily associated with salt ponds rather than tidal flats (Takekawa et al. 2001).

WADING BIRDS

Four species of wading birds nest in or around the Estuary shoreline: snowy egret (*Egretta thula*), great egret (*Ardea alba*), great blue heron (*Ardea herodias*), and black-crowned night heron (*Nycticorax nycticorax*). These birds nest in colonies that may consist of several hundred, just a few, or even a single nest (Kelly et al. 2006). They choose nesting sites for their isolation from intruders and their proximity to wetland feeding areas. Nesting sites are generally located in groves of trees or dense stands of shrubbery close to the Bay shore. On islands or other inaccessible sites, nests of night-herons, in particular, may be on the ground. Colony location provides efficient access to foraging habitat and prey availability (Kelly et al. 2006). Despite their colonial nesting habits, wading birds are solitary foragers, and feed in a wide variety of

wetland habitats ranging from tidal flats, to salt ponds, to densely vegetated tidal marsh and seasonal wetlands. Nesting wading birds usually feed within several kilometers of their nesting sites, primarily in wetlands.

CALIFORNIA GULLS

California gull nesting was recorded in the Estuary for the first time in 1980. Colonies are concentrated in the South Bay salt ponds and at the former Alameda Naval Air Station (NAS). There are no known colonies in the North Bay (Ryan 2000a). They are the most abundant colonial nesting waterbird in the Estuary with 22,718 nests counted in the South Bay in 2008 (Schacter et al. 2008) and an estimated total of 46,800 breeding gulls (Ackerman et al. 2009). Nests are clustered on salt pond levees and artificial islands in or near salt ponds and are vulnerable to mammalian predators in years when water levels recede before nesting is completed (Ryan 2000a). The nesting season is spring, with hatches in late May or early June. Roosting occurs on salt pond levees.

MARSH BIRDS

Although much reduced from their former extent, tidal marshlands that fringe the Bay shore are productive and sensitive habitats supporting a unique suite of plants and animals. Several bird species are entirely dependent on San Francisco Bay's tidal marsh habitats: the federally endangered California clapper rail and the state-threatened California black rail. The most valuable marshlands to rails are large and fully-tidal, and encompass dendritic networks of sloughs and channels. These natural drainage systems provide core habitat for nesting and foraging and therefore are of critical importance (USFWS 2010).

Also, three subspecies of song sparrow – Alameda song sparrow (*Melospiza melodia pusillula*), San Pablo (*M. m. samuelis*) song sparrow, and Suisun song sparrow (*M. m. maxillaris*) – are endemic to San Francisco Bay tidal marshes. Each taxon is resident in a distinct subregion of the Bay and all are California BSSC because of limited distribution and endemism (Shuford and Gardali 2008). The San Francisco (or “saltmarsh”) common yellowthroat (*Geothlypis trichas sinuosa*) is another resident subspecies of the San Francisco Bay marshes; it also is a BSSC. Each of these bird taxa, along with the black rail, has been considered a "Species at Risk" under the Federal Endangered Species Act (i.e., candidates for protection as "threatened" or "endangered").

Several raptors use both saline and brackish marshlands for nesting, foraging, and roosting. Marshes are commonly used by northern harrier (*Circus cyaneus*) and white-tailed kite (*Elanus leucurus*), and occasionally by short-eared owl (*Asio flammeus*). The fresher or less saline portions of the Estuary, such as the upper reaches of Suisun Bay or the Napa and Petaluma Rivers, support several other marsh-adapted birds, including American bittern (*Botaurus lentiginosus*) and least bittern (*Ixobrychus exilis*). Each of these species resides in marshes that support dense stands of emergent monocots (e.g., tules and cattails).

SENSITIVE/SPECIAL-STATUS BIRDS

As described above in the discussion of waterbird guilds, San Francisco Bay is home to or an important migratory stopping point for a large number of avian species that have been listed or proposed for listing as threatened or endangered under the federal or California Endangered

Species Acts; that are listed as California Species of Special Concern by the California Department of Fish and Game (CDFG); or that are otherwise included on the CDFG’s list of special animals. Sensitive/special-status birds that may occur in the WT Plan area and their existing potential for interaction with NMSBs in the Bay are described below and summarized in Table 3.8.2-2. In the context of the WT, “interaction” means that WT users are in close enough proximity to the birds that the birds become aware of their presence (i.e., that some level of response is triggered).

TABLE 3.8.2-2. SENSITIVE BIRDS AND EXISTING LEVELS OF POTENTIAL DISTURBANCE

Name	Listing Status	Ecology and Bay Area Distribution	Existing Potential for Interaction with NMSBs
American bittern (<i>Botaurus lentiginosus</i>)	CDFG: Special Animals	Sparsely distributed in low densities in large patches of emergent monocot vegetation. More common in the fresher portions of the Bay and the northern reaches.	Low. Habitat preference and patchy distribution isolates this species from frequent contact with NMSBs
American peregrine falcon (<i>Falco peregrinus anatum</i>)	Delisted (ESA [1999] and CESA [2009]); FP	Year-round resident widely distributed around the Bay. Nests on bridges, towers, and buildings, often at bay edge. Forages primarily on waterfowl, shorebirds, and pigeons.	Low. Nest sites tend to be located inaccessibly and distant enough from water to avoid disturbance from NMSBs
Black oystercatcher (<i>Haematopus bachmani</i>)	CDFG: Special Animals nest sites	Present in small numbers in San Francisco Bay year-round, and nests in small numbers on rocky outcrops, abandoned wharfs and barges, and jetties, usually in inaccessible locations. Known nesting locations in the Estuary include Red Rock in the Central Bay and Oyster Cove Pier in the South Bay.	Low to moderate. There are few nests and they are widely distributed around the Bay shore. Cryptic nests are typically located on substrate at the water’s edge (rock jetties etc.), which places them close to probable travel routes of NMSBs.
California black rail (<i>Laterallus jamaicensis coturniculus</i>)	ST, FP	Resident population is confined almost entirely to San Pablo and Suisun Bays and restricted to the tidal and brackish marsh vegetation.	Low. Habitat tends to be away from the immediate edges of tidal channels; nest sites cryptic and obscured by dense vegetation.
California brown pelican (<i>Pelecanus occidentalis californicus</i>)	Delisted (ESA [2009] and CESA [2009]). Will require monitoring for five years. FP	Visitor to San Francisco Bay in non-breeding season, from May through November; forages in shallow nearshore waters. Flocks move throughout the more marine portions of the estuary system as the availability of prey shifts; however, there are some traditional roost sites in the vicinity of Fisherman’s Wharf, Alcatraz Island, and Fort Cronkite, Sausalito.	Moderate. Some roost sites are located near high human activity centers including docks, piers, and breakwaters and sand spits. NMSBs are likely to flush roosting birds at ~50 m., especially from low-lying roost sites.
California clapper rail (<i>Rallus longirostris obsoletus</i>)	FE, SE, FP	Resident in SF Bay with entire population restricted to tidal marshlands of San Pablo, Central, and South Bays. Sloughs and channels along the Bay shore provide critical habitat with birds occupying vegetated marsh along the full range of tidal influence (see Figure 3.8.2-2).	Moderate to high. NMSBs may enter tidal sloughs and channels. Rails forage along channel slopes and nests tend to be associated with the headward extent of channels.
California least tern (<i>Sterna antillarum</i>)	FE, SE, FP	Active nesting sites are located at Alameda Naval Air Station, Montezuma	Low to moderate, depending on season. Colonies are located away

TABLE 3.8.2-2. SENSITIVE BIRDS AND EXISTING LEVELS OF POTENTIAL DISTURBANCE

Name	Listing Status	Ecology and Bay Area Distribution	Existing Potential for Interaction with NMSBs
<i>browni</i>)		Slough (Solano County), Pittsburg power plant (Contra Costa Co.), Napa Plant Site (Napa Co.), and Montezuma Slough wetlands (Solano Co.); these locations are shown in Figure 3.8.2-3 They have also nested historically at Oakland Airport and Bair Island.	from expected watercraft thoroughfares and typically on protected properties where access is restricted. Overlap between NMSB routes and tern foraging habitat along the East Bay shoreline in summer (April-August) is likely.
Caspian tern (<i>Hydroprogne caspia</i>)	CDFG: Special Animals nesting colonies	Active nesting colonies of Caspian tern are located at Knight Island, Brooks Island, Coyote Hills, Alviso, Hayward Shoreline, former Alameda NAS, and Ravenswood Open Space Reserve.	Low to moderate. Most colonies are relatively inaccessible or remote. Colonies on islands could be accessible to NMSB users, such as at Brooks Island, which is protected only by signage.
Colonial nesting wading birds: snowy egret (<i>Egretta thula</i>), great egret (<i>Ardea alba</i>), great blue heron (<i>Ardea herodias</i>), and black-crowned night heron (<i>Nycticorax nycticorax</i>)	CDFG: Special Animals Rookery sites	Colonial wading birds choose nesting sites for their isolation from intruders and their proximity to wetland feeding areas. Nesting sites are generally located in groves of trees or dense stands of shrubbery close to the Bay shore. On islands or other inaccessible sites, nests of night-herons, in particular, may be on the ground. Distribution of nesting sites around the Bay has been thoroughly documented in Kelly et al. 2006 (see Figure 3.8.2-4).	Moderate. Many colonies are located in trees or other inaccessible structures. Colonies on islands could be accessible to NMSB users. Some sites are protected and patrolled (e.g., Alcatraz Island). Others are protected only by signage (e.g., Brooks Island).
Double-crested cormorant (<i>Phalacrocorax auritus</i>)	CDFG: Special Animals Rookery sites	A common colonial nesting waterbird in the Bay; major colonies are located at the Napa Sonoma Marshes Wildlife Area near Napa, in the Central Bay on the Richmond and Oakland-Bay bridges, and in the South Bay on the Dumbarton Bridge. Large foraging flocks move in and out of the Bay, often over deeper water, as prey availability shifts.	Low to moderate. Nesting colonies are mostly high, on man-made structures. Roosting sites and foraging area may overlap with NMSB use areas.
Elegant tern (<i>Thalasseus elegans</i>)	CDFG: Special Animals (nesting colony)	The elegant tern roosts in large flocks during migration (July-Sept) along sand spits, levees, breakwaters, islets, and other shoreline features. It does not yet nest in the Bay (but its distribution is expanding northward).	Moderate. Roosting flocks may occasionally be present in areas used by NMSBs, especially sandbars, jetties, islands, and low-lying flats.
Forster's tern (<i>Sterna forsteri</i>)	CDFG: Special Animals Nesting colonies	Forster's terns nest in many of the same locations as California least tern, snowy plover, and California gull, and often roost on undisturbed Bay beaches, jetties, etc. In the North Bay, Forster's tern nesting sites are associated with the Napa River salt ponds, notably at Russ Island, Knight Island, and White Slough. Numbers are higher in the South Bay where several dozen sites are associated with the Dumbarton (Ravenswood), Baumberg (Eden Landing), Coyote Hills, Hayward Shoreline, and Turk Island ponds (Ryan 2000b).	Low to moderate. Colony locations are mostly inaccessible and protected, though incipient colonies may be prone to inadvertent disturbance.

TABLE 3.8.2-2. SENSITIVE BIRDS AND EXISTING LEVELS OF POTENTIAL DISTURBANCE

Name	Listing Status	Ecology and Bay Area Distribution	Existing Potential for Interaction with NMSBs
Least bittern <i>(Ixobrychus exilis)</i>	BSSC	Very rare inhabitant of fresh to brackish marshes with dense emergent monocot vegetation. More likely to occur in Delta than San Francisco Bay proper.	Low. Rarity of species and habitat preference reduces the risk of interaction.
Western burrowing owl <i>(Athene cunicularia hypugaea)</i>	CDFG: BSSC	Burrowing owls occur in lowlands and at the edge of tidal wetlands, especially in the non-breeding season. Typical nesting habitat consists of sparsely vegetated levees, especially where cavities in rubble, debris, rip-rap, or mammal burrows occur. This species is largely extirpated from former breeding sites around the Bay. Nearly all of the remaining nesting burrowing owls in the Bay area are between Palo Alto and the Fremont-Newark area of the South Bay (Trulio 2000). The only sites that support viable breeding populations are the NASA Ames Research Center and the San Jose Airport (Townsend and Lenihan 2007).	Low. Nesting sites are located away from water’s edge. Winter roost sites may be in rip-rap of seawalls or levee berms (e.g., Cesar Chavez Park, Berkeley) and could be encountered by watercraft that approach close to these features.
Western snowy plover <i>(Charadrius alexandrinus nivosus)</i>	FT BSSC	SF Bay contains an estimated 5-10 percent of the nesting western snowy plovers in California (Page et al. 2000, USFWS 2007). Most nesting in San Francisco Bay is associated with emergent or dry salt pond beds, or sometimes levee roads. Breeding locations in the Estuary at Eden Landing Ecological Reserve/ Baumberg North, salt ponds at Oliver Salt Ponds, Dumbarton Salt Ponds, Warm Springs, Alviso, and Ravenswood. In the North Bay nesting occurs at Ponds 7 and 7A in the Napa Sonoma Marshes Wildlife Area and at the Montezuma Slough Wetland Restoration site (see Figure 3.8.2-3).	Moderate. Nest sites are mostly on access-limited sites or in pans away from watercourses. Nests on levees adjacent to sloughs and open baylands may be encountered by NMSB users. (See text for prescriptions in the 2007 Recovery Plan.)
<p>FE —Federally listed endangered FT —Federally listed threatened SE —California state listed endangered species ST—California state listed threatened FP—State Fully Protected CDFG Special Animals (July 2009) BSSC — California Bird Species of Special Concern (2008) References: Shuford, W.D. and T. Gardali. Eds. 2008 CDFG Special Animals (July 2009)— http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/spanimals.pdf</p>			

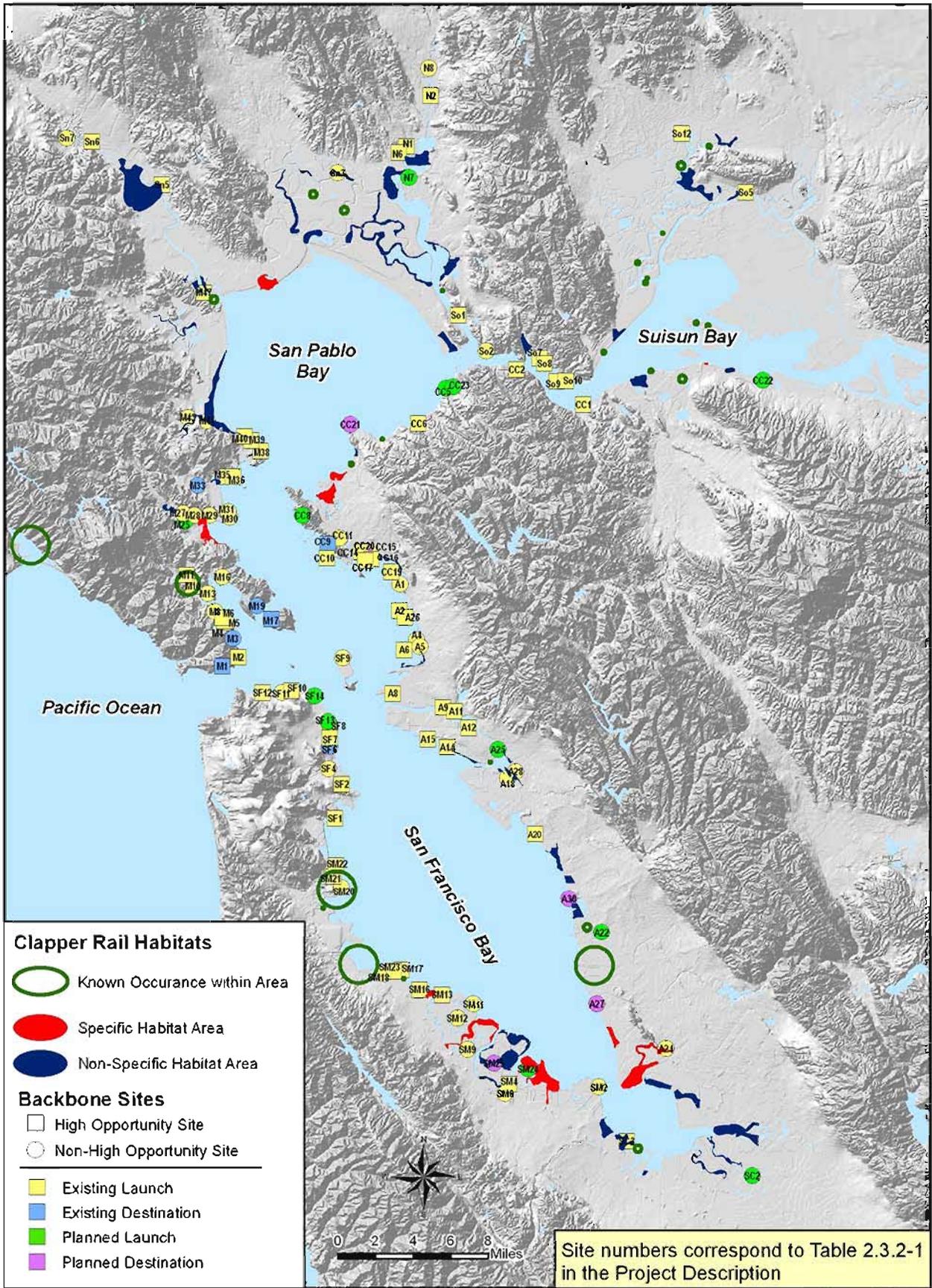


Figure 3.8.2-2
Clapper Rail Habitats

Bay Water Trail GIS data provided by BCDC
Clapper rail data from CNDDB, 2007



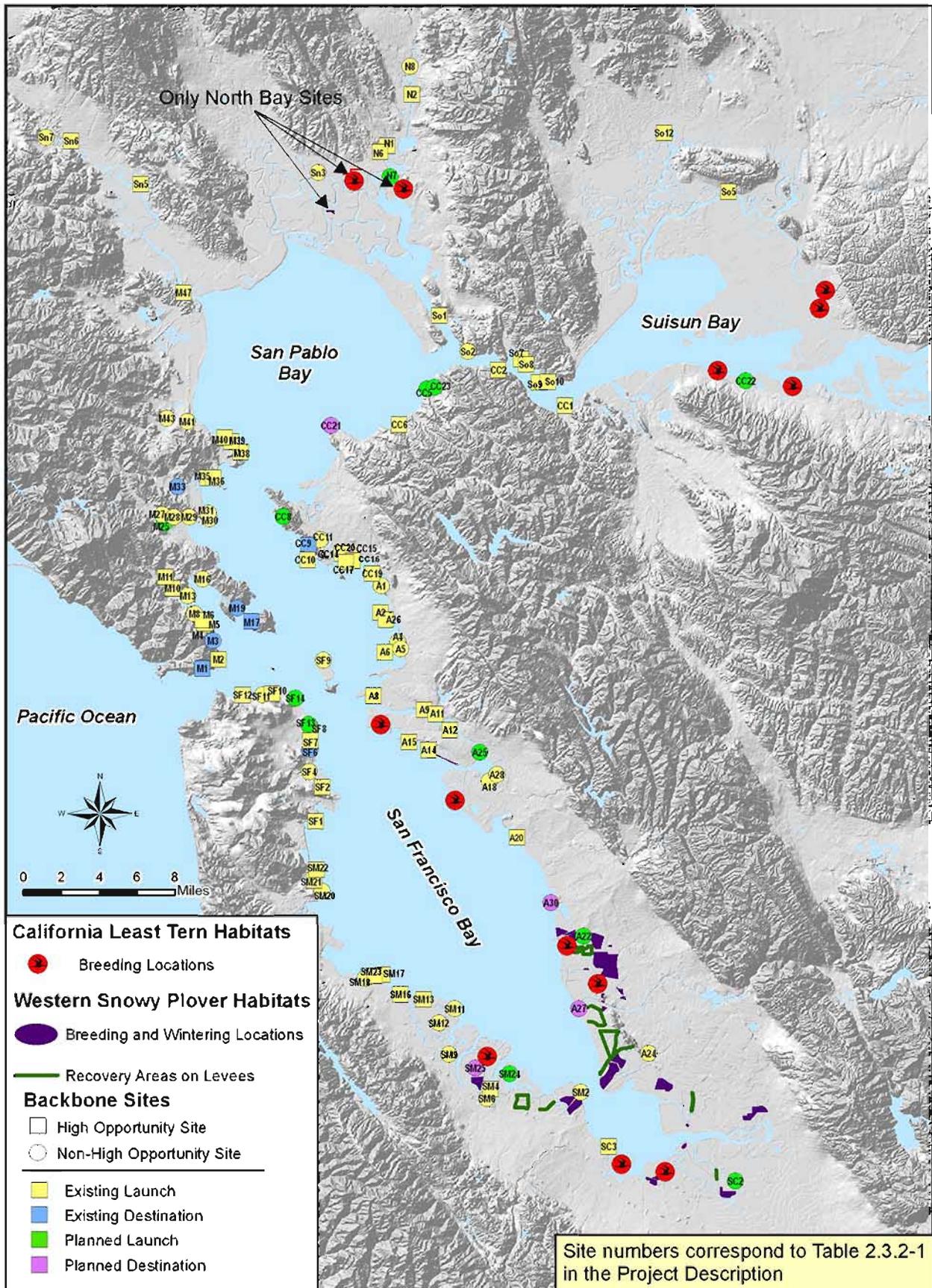


Figure 3.8.2-3
Western Snowy Plover and
California Least Tern
Habitats

Site numbers correspond to Table 2.3.2-1 in the Project Description

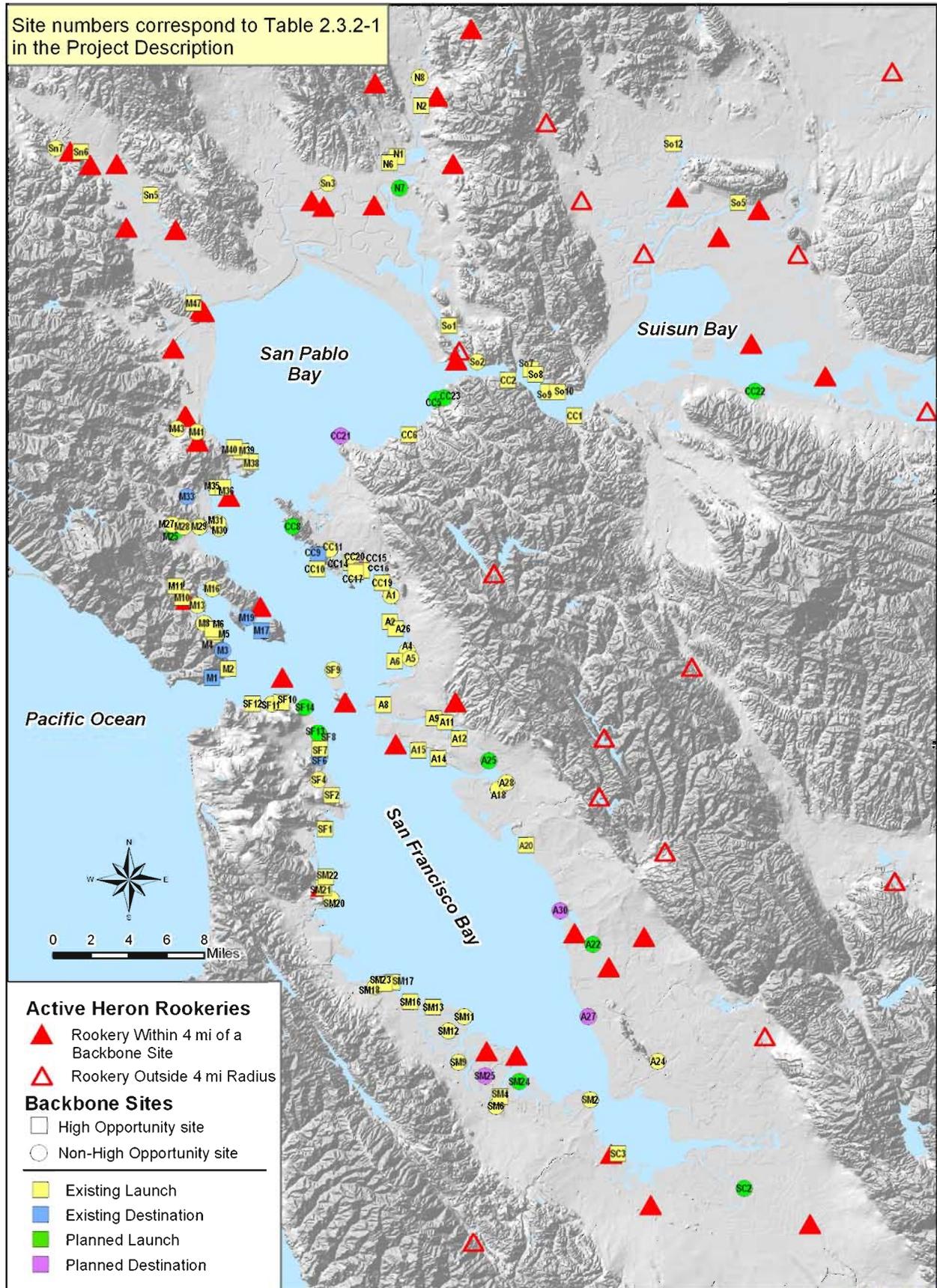


Figure 3.8.2-4
Heron and Egret Rookeries

Bay Water Trail GIS data provided by BCDC
Heron rookery data from Kelly et al. 2006

GEC Environmental Consulting



AMERICAN BITTERN AND LEAST BITTERN

The American bittern (*Botaurus lentiginosus*) is included in the CDFG list of Special Animals (2009), and the least bittern (*Ixobrychus exilis*) is a BSSC during the nesting season. Both are rare inhabitants of San Francisco Bay marshes and occur in brackish to freshwater environments with dense growth of relatively tall tule and cattail marsh vegetation (*Schoenoplectus* and *Typha*) characteristic of the inner reaches of Suisun Bay and, to a lesser extent, innermost San Pablo Bay. Both species forage on channel edges.

AMERICAN PEREGRINE FALCON

The American peregrine falcon (*Falco peregrinus anatum*) is included on the CDFG list of Fully Protected Animals and is a USFWS bird of conservation concern. The peregrine falcon population is increasing in the Bay Area. The peregrine has recently been “delisted” from endangered status by the CDFG in part because of the strength of the population and increased reproductive success. Peregrines nest solitarily in the Bay Area on the larger bridges (e.g., Bay Bridge), PG&E power towers along the shoreline (e.g., Napa River), and occasionally on skyscrapers.

BLACK OYSTERCATCHER

The black oystercatcher (*Haematopus bachmani*) is on the CDFG list of Special Animals (2009) to protect nesting sites and is a USFWS bird of conservation concern. This highly territorial bird is present in small numbers in San Francisco Bay year-round, and nests in small numbers on rocky outcrops, abandoned wharfs and barges, and jetties, usually in inaccessible locations. Oystercatchers are extremely vigilant and scold intruders at a distance.

CALIFORNIA BLACK RAIL

The California black rail is state-threatened under the California Endangered Species Act and was formerly classified as a Category 1 taxon by USFWS, a candidate for federal listing as threatened. It is also included on the CDFG list of Fully Protected animals. The bulk of the western population (>90 percent) is confined to the remnant emergent tidal marshlands of the Bay (Evens et al. 1991, Evens and Nur 2002). The black rail is resident in the Bay. Vegetation at and above mean higher high water (MHHW) is a necessary habitat feature, providing refuge from predation for the birds during periods of extremely high tides (Evens and Page 1986, Trulio and Evens 2000). The breeding population in the Bay is confined almost entirely to San Pablo and Suisun Bays (Figure 3.8.2-2). Black rail populations are highly dynamic, and abundance estimates are somewhat theoretical. The most recent estimate is of a population size range from 4000-7200 individuals in each of the two subregions (Evens and Nur 2002). The most valuable marshlands to rails are fully tidal and encompass dendritic networks of sloughs and channels which provide core habitat for nesting and foraging and therefore are of critical importance to rails.

CALIFORNIA BROWN PELICAN

The California brown pelican was delisted under the federal Endangered Species Act effective December 17, 2009; the estimated nationwide population is now 650,000 individuals. However, the delisting requires continued monitoring for a period of five years and the California brown pelican continues to be subject to the MBTA (74FR59444). On the State level, this species was

delisted under the California Endangered Species Act in 2009, but it is still considered a California Fully Protected species. California brown pelicans tend to congregate adjacent to open Bay waters, rarely traveling up smaller sloughs and watercourses. This species' nesting and foraging locations and preferences are described on Table 3.8.2-2.

CALIFORNIA CLAPPER RAIL

The California clapper rail is a federally and California-listed endangered species, and it is included on the CDFG list of Fully Protected animals. Although more widely distributed along the central California Coast historically, this species is now wholly confined to Estuary marshes. Numbers of clapper rails were estimated at 300-500 individuals in 1990-91 (USFWS unpubl. data), followed by a rebound to 800 individuals by 1993 (Albertson and Evens 2000). More recent population estimates place the Baywide population at about 1,500 individuals evenly distributed between north and south Bay marshes (Albertson and Evens 2000, Avocet Research, CDFG, PRBO, and USFWS, unpubl. data). The increase and stabilization of the population is attributed, in part, to control of non-native predators such as red fox (*Vulpes vulpes*) and Norway rat (*Rattus norvegicus*) (Albertson and Evens 2000). The clapper rail occurs primarily in emergent salt and brackish tidal marshlands, subject to direct tidal circulation and with a predominant cover of pickleweed, extensive stands of cordgrass, and abundant high tide cover (Figure 3.8.2.-2). Many of the tidal marsh restoration projects underway and proposed in San Francisco Bay have a primary goal of increasing clapper rail habitat and serving the recovery goals of this species.

CALIFORNIA LEAST TERN

The California least tern is federally and state-listed as endangered, and it is included on the CDFG list of Fully Protected animals. Active nesting sites are located at Alameda Naval Air Station, Montezuma Slough (Solano County), Pittsburg power plant (Contra Costa Co.), and most recently the Napa Plant Site (Napa County); historically, terns also nested at Oakland Airport and Bair Island (Feeney 2000, Keane 1998). For nesting, least terns require sparsely vegetated nearshore tracts of open sand or gravel. They feed regularly during the breeding season (April through August) over shallow, open, nearshore waters of the Bay, especially along the east shore of the central Bay (e.g., Alameda shoreline) and the south shore of Suisun Bay (Pittsburg shoreline). The species responds favorably (increased number of pairs, improved productivity) to management and protection of nesting areas (Britton 1982). San Francisco Bay is also the northernmost breeding location for the California least tern, with the nearest colony 330 km to the south (at Pismo dunes). The Alameda colony was the State's fourth largest producer of fledglings (Feeney 2000) (Figure 3.8.2-3). Nesting status of the Alameda colony in 2009 included 344 nests (S. Euing, pers. comm. July 3, 2009).

CASPIAN TERN, ELEGANT TERN, AND FORSTER'S TERN

The Caspian tern (*Hydroprogne caspia*), elegant tern (*Thalasseus elegans*), and Forster's tern (*Sterna forsteri*) are all USFWS birds of conservation concern; the elegant tern is also classified as California BSSC (nesting colonies) by CDFG. These terns nest in many of the same locations as California least tern, western snowy plover, and California gull. Terns often roost on undisturbed Bay beaches. Various species are often intermingled within a colony or roosting flock. Elegant tern does not nest in the Bay (but its distribution is expanding northward), but Forster's and Caspian nest on dredge spoil islands and degraded, insular levees. Additional

information on these species' nesting and foraging locations and preferences is presented on Table 3.8.2-2.

COLONIAL NESTING WADING BIRDS

Colonial wading birds, such as herons and egrets, are listed on the CDFG list of Special Animals (2009) to protect nesting sites, and are most sensitive to disturbance during the nesting season. As large, colonial birds, they are more sensitive to disturbance than many other types of birds. Nests are subject to high predation pressure if the adult birds are flushed from the nests. Timing of nesting is an important management criterion. The early portion of the nesting cycle is when these birds are most prone to disturbance (abandonment, lowered reproductive success) (Carney and Sydeman 1999, Kelly et al. 2006). The only time period when colonies are not likely to be active is mid-September into mid-December. The availability of appropriate nest sites is a limiting factor on population size. Nesting wading birds usually feed within several kilometers of their nesting sites, primarily in wetlands, and access to these wetlands is an important component of nesting success and colony vigor (Kelly et al. 2005, McCrimmon et al. 2001). Distribution of nesting sites around the Estuary has been thoroughly documented in Kelly et al. 2006 (Figure 3.8.2-4). The protection of these nesting sites from human intrusion is a necessary component of population viability.

DOUBLE-CRESTED CORMORANT

CDFG removed the double-crested cormorant from its list of BSSC, but it is still on the CDFG's list of special animals out of concern for rookery sites. Since the 1970s, the double-crested cormorant has nested in small numbers around the Estuary, especially on transmission towers, bridges, snags and occasionally trees. It is a colonial nesting waterbird, now common in the Estuary, and major colonies are located at the Napa Sonoma Marshes Wildlife Area (Napa County), in the Central Bay on the Richmond and Oakland-Bay bridges, and in the South Bay on the Dumbarton Bridge (Ainley 2000). The double-crested cormorant forages in flocks on open water and is regularly in the Estuary year-round. It is more common, however, in winter.

WESTERN BURROWING OWL

The western burrowing owl is a California BSSC (burrows and some wintering sites) and a USFWS bird of conservation concern. While not a wetland species, per se, burrowing owls do occur in lowlands and at the edge of tidal wetlands, especially in the non-breeding season. Typical nesting habitat in the Estuary is associated with sparsely vegetated levees, especially where cavities in rubble, debris, rip-rap, or mammal burrows occur. This species is largely extirpated from former breeding sites around the Estuary. Nearly all of the remaining nesting burrowing owls in the Estuary area are between Palo Alto and the Fremont-Newark area of the South Bay (Trulio 2000). The only sites that support viable breeding populations are the NASA Ames Research Center and the San Jose Airport (Townsend and Lenihan 2007).

WESTERN SNOWY PLOVER

The Pacific coastal population of western snowy plover is federally threatened (03/05/1993), a California BSSC, and a federal bird of conservation concern. Critical habitat was designated on September 29, 2005; a recovery plan was published on September 24, 2007. The number of adult plovers in San Francisco Bay declined from a high of 351 in 1977/80 to 99 in 2006, approximately seven percent of the species' California population. San Francisco Bay contains

an estimated 5-10 percent of the nesting western snowy plovers in California (Page et al. 2000, USFWS 2007) (Figure 3.8.2-2). The goal of recovery is 500 breeding adults in San Francisco Bay (USFWS 2007). A Bay-wide survey in 2009 indicated the presence of approximately 147 adults³⁴.

Recent surveys locate the largest breeding populations in the Bay at Eden Landing Ecological Reserve/Baumberg North managed by CDFG. Other population centers are located in salt ponds at Oliver Salt Ponds, Dumbarton, Warm Springs, Alviso, and Ravenswood. In the North Bay, the only known locations are in Napa County at Napa Sonoma Wildlife Area Ponds 7 and 7A (USFWS 2007), and recently (2006/2007) at the Montezuma Slough Wetland Restoration site (R. Leong, pers. comm.). Most nesting in San Francisco Bay is associated with emergent or dry salt pond beds, or sometimes levee roads (Page et al. 1995). The distribution of nesting sites around the Estuary is depicted in Figure 3.8.2-3.

WATERBIRD POPULATION TRENDS

Waterbird population trends are difficult to determine, because there is substantial inter-annual variation in bird populations. In addition, for most waterbird species, standardized surveys of San Francisco Bay populations have not been conducted over a sufficient period to allow for population trends to be determined. The exception is provided by waterfowl, which have been surveyed by the USFWS via mid-winter aerial surveys since 1970 (Table 3.8.2-1). For waterfowl in San Francisco Bay, average waterfowl abundance during these mid-winter surveys has declined from 425,000 during the period 1970-1991 to 182,800 during the period 1992-2007 (excluding 1996) (Takekawa et al. 2008). Bay area waterfowl numbers decreased 25 percent from the 1950s to 1990 (Takekawa et al. 2000). This decline in abundance of waterfowl is likely the combined result of local, regional, continental, and even global influences. Many stressors on bird populations operate at these different scales simultaneously. Some of the primary stressors on waterbird populations within the San Francisco Estuary are described below.

HABITAT LOSS

The quantity and quality of habitat in San Francisco Bay has an influence on the fitness and survival of the species that migrate through, spend the winter, and nest in the Estuary. Anthropogenic changes to the Estuary have drastically changed the extent and nature of its open water and wetland habitats, reducing the amount of available habitat for both resident and migratory waterbirds. Habitat loss is not limited to San Francisco Bay, so for many migratory waterbirds, habitat loss in both breeding and wintering areas produces collective adverse impacts. While most habitat loss in the Bay has been a direct result of human activities such as diking and filling, habitat loss via global warming mechanisms (e.g., sea level rise, constriction of intertidal habitat, changes in local vegetation communities) may be an indirect yet significant means by which additional waterbird habitat is lost (Galbraith et al. 2002).

CLIMATE CHANGE

Warming temperatures associated with climate change are expected to result in an acceleration in current rates of sea level rise, inundating many low-lying coastal and intertidal areas. Rising sea

³⁴<http://www.fws.gov/arcata/es/birds/WSP/documents/2009%20Pacific%20Coast%20breeding%20SNPL%20survey.pdf>

levels are expected to have a huge impact on lowland coastal habitats around the world, and coastal bird and seabird species are likely to suffer as a result. Habitat changes associated with sea level rise will have important implications for organisms that depend on these habitats, including shorebirds that rely on intertidal flats for feeding habitat during their migrations and in winter (Galbraith et al. 2002) and resident tidal marsh birds that nest in inter- and supra-tidal habitats (Evens et al. 1991, Goals Project 1999). The effect of predicted climate change will not only reduce habitat availability for shorebirds and tidal marsh birds, but will disrupt ecological and behavioral synchronicity (i.e., phenology of migration and nesting). The effect of sea-level rise associated with climate change will affect those species that nest on low-lying nearshore substrates—terns, rails, waterfowl, wading birds, song sparrows—not only through direct habitat loss, but also through the increased incidences of storm surge and its impact on reproductive success (Wormsworth and Mallon 2008).

Birds that nest only in tidal marshes, like the California clapper rail, will be especially vulnerable to climate change. Climate change is expected to threaten these species by making marsh depths more variable, pushing water levels above or below the 5-12 cm range preferred by birds that nest in or adjacent to tidal marsh.

POLLUTION

Pollution within and around the Bay impairs ecosystem health and productivity, limiting the size of waterbird populations that the Bay is capable of supporting, and reducing nesting success (Ackerman et al. 2007). Acute pollution events such as oil spills are capable of killing large quantities of waterbirds in a short period of time; for example, the November 2007 Cosco Busan spill is thought to have killed over 20,000 waterbirds, many of them rafting waterfowl such as scoters and grebes (IBRRC 2008).

INVASIVE AND NON-NATIVE SPECIES

Invasive plants are changing the structure of many ecosystems around the Bay, which can potentially reduce the ability of these systems to support native waterbirds. For example, invasive smooth cordgrass chokes tidal channels and rapidly colonizes mudflats, reducing foraging habitat for rails and shorebirds, respectively (ISP 2001). Invasive wildlife such as clams, snails, crabs, and fish may also adversely impact waterbirds by changing food web dynamics throughout the Bay. Non-native species such as feral cats adversely impact certain waterbird communities (especially marsh birds such as rails) by directly preying on individuals (Avocet Research Associates 2008).

WATERCRAFT TRAFFIC

As a major port center on the West Coast of the U.S., San Francisco Bay has experienced heavy ship traffic since the earliest days of European settlement. This traffic increased progressively through the last 160 years as the Bay Area developed into a commercial hub. This activity has caused ongoing and increasing disturbance to waterbirds, but the cumulative extent of these impacts is unknown. Commercial and military traffic was and is largely confined to the deep-water channels and the vicinity of ports in the Central Bay. Public transportation (e.g., the Golden Gate ferry system) also follows relatively deep water channels and prescribed shipping lanes in the shallower areas of the Bay.

A recent U.S. Geological Survey (USGS) study on the effects of ferries on waterfowl in San Francisco Bay indicated that passing ferries create disturbances to waterbirds at distances ranging from 50 to 600 meters on both sides of the ferry, with most effects observed within a 300-m zone (for scoters) on both sides of the ferry (Takekawa et al. 2008). Scoters were determined to be more sensitive than scaup in terms of an alert response; however, other behaviors (swimming away, diving, flying away) were triggered at similar distances for both types of waterbirds. At a distance of approximately 225 meters, many birds flew out of the area; at greater distances, disturbance responses included swimming away, alerting, and diving. These birds are the most common waterbirds in the Estuary and provide a general understanding of the potential distribution patterns for waterbirds³⁵. The study indicated that the existing ferry routes transect approximately 3 percent of the 315.13 km² in the Bay determined to be foraging zones for waterbirds, with a total effect zone that equals approximately 106 km², or 11 percent of San Francisco Bay. With the addition of the 10 ferry routes proposed by the WETA, the area of San Francisco Bay that would be subject to ferry traffic and effect zone for birds would increase by 126.05 km² to 23 percent. Foraging zones affected by these additional routes would increase by 47.91 km² to 18 percent of existing foraging zones.

Recreational watercraft, both motorized and non-motorized, have also had an abiding presence in the Bay. Recreational use by NMSBs, especially kayaks, increased substantially beginning in the 1970s as described in Section 3.3. The shallow draft of these watercraft allow people to enter shallower water, including tidal sloughs and channels. In addition, sailboarders and windsurfers, biological research vessels, military training exercises, canoeists and small fishing vessels have used every navigable waterway in the Bay for many decades. There are few studies that quantify the effects of these ongoing disturbances on waterbird populations in the Estuary, and those that have been conducted are site specific (e.g., at North Basin on the Berkeley waterfront [Avocet Research Associates 2009]).

3.8.3 LOCAL SETTING

The proximity of the 112 Backbone Sites to sensitive habitat and sensitive species varies. Certain areas have been specifically identified as sensitive in a number of planning documents, as described below under Regulatory Setting. The distribution of sensitive habitats for key bird species around the Bay is shown in Figures 3.8.2-2 to 3.8.2-4. The potential for sensitive species to be present in the vicinity of a trailhead will be evaluated for each trailhead during the trailhead designation process.

3.8.4 REGULATORY SETTING

FEDERAL REGULATIONS AND PLANS

Federal regulations described in Section 3.7 of this document - Sections 7, 9, and 10 of the Endangered Species Act, Section 404 of the Clean Water Act, and Executive Order 11990 - also apply to the protection of birds. The Comprehensive Conservation Plans (CCPs) being prepared for the San Pablo Bay NWR and Don Edwards NWR will also address birds.

³⁵ Recent surveys show that scaup and scoter are the most common waterbirds in the Estuary, comprising 87% of the total waterbirds on open water during three recent winter counts (2004/2005, 2005/2006, and 2006/2007) (Takekawa, et al., in publication).

MIGRATORY BIRD TREATY ACT (MBTA)

In addition to the above, the provisions of the Migratory Bird Treaty Act (MBTA) of 1918³⁶ apply to non-resident birds using the Estuary. The MBTA states that: “Unless permitted by regulations, the Act provides that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not.” The relevant provision as it applies to migratory waterfowl and watercraft is “pursue.” Virtually all the waterbirds that occur in San Francisco Bay are included on the list of species covered by the MBTA.

TIDAL MARSH RECOVERY PLAN

The *Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (USFWS 2010) was released for public comment on February 10, 2010. For the California clapper rail and salt marsh harvest mouse (*Reithrodontomys raviventris*), the Draft Recovery Plan, when adopted, will replace the outdated 1984 recovery plan that covered these two species. The current Draft Recovery Plan also covers three federally listed tidal marsh-dependent plant species: the soft bird’s beak, California sea-blite, and Suisun thistle. It also addresses 11 species of conservation concern that are not federally listed: the salt marsh wandering shrew (*Sorex vagrans halicoetes*), Suisun shrew (*Sorex ornatus sinuosus*), San Pablo vole (*Microtus californicus sanpabloensis*), California black rail, the three song sparrow subspecies inhabiting the San Francisco Bay, San Francisco common yellowthroat, old man tiger beetle (*Cicindela senilis senilis*), delta tule pea, and Pacific cordgrass.

The Draft Recovery Plan assesses the habitat and life cycle requirements of these species, the reasons these species are of conservation concern and potential threats to these species, and also identifies a recovery strategy for tidal marsh ecosystems in northern and central California and for the individual species. For each of the federally listed species covered by the draft Plan, recovery units are identified around core populations, and specific criteria for success of population recovery efforts are identified.

For the California clapper rail, recovery units are identified for core populations around San Francisco and San Pablo Bays. The recovery units for the California clapper rail identified in the draft plan are listed below.

Central/Southern San Francisco Bay Recovery Unit

- Corte Madera marsh
- Bair-Greco-Ravenswood
- East Palo Alto-Guadalupe Slough
- Guadalupe Slough-Warm Springs
- Mowry-Dumbarton,
- Hwy 84 to Hwy 92 (Coyote Hills/Baumberg)

³⁶ 16 U.S.C. §§ 715-715r, February 18, 1929, as amended 1935, 1961, 1962, 1966-1968, 1970, 1973, 1976, 1978, 1983, 1984, 1986, 1988 and 1989.

- Cogswell-Hayward Shoreline/Ora Loma/Robert's Landing

San Pablo Bay Recovery Unit

- China Camp to Petaluma River
- Petaluma River marshes
- Petaluma River to Sonoma Creek
- Napa marshes (Sonoma Creek to southern tip of Mare Island)
- Point Pinole marsh

Suisun Bay Area Recovery Unit

- Western Grizzly and Suisun Bays and marshes of Suisun, Hill and Cutoff Sloughs.

Specific criteria for downlisting and recovery of the California clapper rail focus on achievement of minimum population sizes within each of these three recovery units and a reduction in threats to the species' habitat and populations by achieving minimum acreages of high-quality tidal marsh habitat within each core population; controlling invasive smooth cordgrass and its hybrids; reducing the extent of broadleaf pepperweed; and reducing disturbance to rails. This latter criterion, which is most applicable to the WT Plan, includes "Implementation of site-specific management plans on lands owned by U.S. Fish and Wildlife Service, California Department of Fish and Game, East Bay Regional Park District, and Mid-Peninsula Open Space District to reduce recreation-based (human-caused) disturbance to rails, both by reduction of physical disturbance to rails from humans or dogs and by elimination of litter and feeding stations which serve to attract predators, thereby degrading habitat quality."

Also applicable to the WT Plan is one of the five ecosystem-level strategies for recovery of these tidal marsh ecosystems: "Improve coordination, participation, and outreach activities to achieve recovery of listed species and long-term conservation of species of concern." The educational efforts of the WT Plan, particularly with regard to educating boaters regarding the importance of avoiding, and ways to avoid, disturbance of clapper rails furthers this component of the Draft Recovery Plan's conservation strategy.

Among the Draft Recovery Plan's regional conservation strategies is a set of guidelines on public use. These guidelines acknowledge and encourage the importance of tidal marsh appreciation by the public but also encourage the design of public use with consideration of impacts to tidal marsh species. These guidelines recommend that public use be guided to a few low-impact locations, that trails within marsh habitat be minimized, and that terrestrial shoreline trails be located well away from the high tide edge and high tide refugia.

WESTERN SNOWY PLOVER RECOVERY PLAN

The Pacific coast population of the western snowy plover was listed as threatened on March 5, 1993 and the Recovery Plan was finalized and released on September 27, 2007 (USFWS 2007). The recovery strategy listed in the Recovery Plan includes three major components: increasing population numbers throughout the range of the Pacific coast population of the species, reducing or eliminating threats through habitat management, and monitoring plover populations and threats to determine recovery success and refine management actions. Among six recovery units

established in the Recovery Plan, San Francisco Bay was included with a goal of supporting 500 breeding adults. As noted earlier, a Bay-wide survey in 2009 indicated the presence of approximately 147 adults³⁷. Recovery criteria focus on achieving targets for population size within sub-regions, meeting targets for reproductive success, and establishing management actions.

Pertinent to the WT Plan, boating is not specifically included in the long list of factors affecting the continued existence of the western snowy plover on pages 153-155 of the Recovery Plan, which indicates that “Recreational activities that occur in or over deep water (such as the beach- and water-oriented activities of surfing, kayaking, wind surfing, jet skiing, and boating...) may not directly affect western snowy plovers.” However, the Plan does state that people accessing the shoreline in areas where plovers occur could potentially affect this species. In addition, specific recommendations regarding access by boaters to areas used by snowy plovers are included in one of the recovery actions in the Recovery Plan, as follows:

2.3.1.2 Locate new access points and trails well away from western snowy plover nesting and wintering habitat, and modify existing access and trails as necessary. Recreational users such as campers, clammers, anglers, equestrians, collectors, etc., should be encouraged to consistently use designated access points and avoid restricted areas. Roads, trails, designated routes, and facilities should be located as far away from western snowy plover habitat as possible. Recreationists using boats should be restricted or prohibited from areas being used by the western snowy plover.

Appendix C, Table C-1 of the Recovery Plan identifies six locations within San Francisco Bay where boat use is currently prohibited or restricted to protect snowy plovers. These are the levee of Salt Pond 7A along the Napa River, the Alameda South Shore, the salt ponds north of Highway 92 in Hayward, the Mowry salt ponds in Fremont, the Knapp salt pond (Pond A6) near Alviso, and Crittenden Marsh in Mountain View. This table also lists one location, Crissy Field in San Francisco, where restrictions on boat access are recommended in the future to protect plovers.

One of the conservation efforts on public lands listed as important in the Recovery Plan is public outreach and education. The educational efforts of the WT Plan, particularly with regard to educating boaters regarding the importance of avoiding, and ways to avoid, disturbance of sensitive species such as the western snowy plover furthers this component of the Recovery Plan’s conservation strategy.

STATE REGULATIONS

As described in Section 3.7, the Porter-Cologne Water Quality Act protects the beneficial uses of California’s waters including wetland habitat. Executive Order W-59-93, California Wetlands Conservation Policy, stresses no overall net loss of wetlands and the restoration of wetlands with the purpose of protecting habitat for bird and other wetland dependent species.

CALIFORNIA ENDANGERED SPECIES ACT/CALIFORNIA FISH AND GAME CODE

³⁷<http://www.fws.gov/arcata/es/birds/WSP/documents/2009%20Pacific%20Coast%20breeding%20SNPL%20survey.pdf>

The California Endangered Species Act, described in Section 3.7, also applies to birds. In addition, certain provisions of the California Fish and Game Code, Section 1600 et seq. (Streambed Alteration Agreements) apply to wildlife. This section of the Fish and Game Code is designed to protect the state’s fish and wildlife resources from harmful impacts of activities that occur near any rivers, streams, lakes and other water bodies in the state, regardless of the amount or duration of flow. Prior to undertaking stream-altering activities that may adversely affect fish or wildlife, applicants must notify the CDFG, pay fees, and enter into an agreement with CDFG for authorization. CDFG may authorize (for up to five years) alteration of streams with scientifically sound, reasonable conditions to avoid or minimize harm (substantial adverse effects) and protect fish and wildlife resources. CDFG has discretionary authority to modify the conditions of a Section 1600 Stream Alteration Agreement.

Other sections of the California Fish and Game Code protect various species and habitats. Birds are specifically addressed in Sections 3500-3864 of the Code.

“FULLY PROTECTED” SPECIES

The Fish and Game Code also includes a less familiar special legal status for some species as “fully protected,” which is a category developed before CESA was authorized.³⁸ Most “fully protected” species have been placed on the state list of rare, threatened, or endangered species, but some have not. Prohibitions against take of “fully protected” species are more stringent and inflexible than those of CESA, generally prohibiting nearly all “take,” and provide no instrument to authorize “take” except for recovery and research actions. Among the species that are considered fully protected are five birds that occur within the San Francisco Bay area: the California clapper rail, California black rail, California brown pelican, California least tern, and American peregrine falcon.

LOCAL AND REGIONAL REGULATIONS AND PLANS AND POLICIES

MCATEER-PETRIS ACT

The McAteer-Petris Act, described in Section 3.7, promotes the protection of existing tidal water habitats and restoration of wetlands that would provide habitat for the species described above. The public access and recreation policies of the Bay Plan recognize the potential for adverse impacts to wildlife from recreational activities, and support proper location, improvement, and management of recreational uses as tools for reconciling habitat and wildlife conservation with recreation (BCDC 2007a). These policies also call for public access to be sited, designed and managed to prevent significant adverse effects on wildlife.

3.8.5 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The potential significance of impacts to avian resources is determined partly by regulatory requirements, and partly by the scientific literature on ecology, conservation biology, and related environmental sciences. The following criteria are considered in this EIR as thresholds of significance for adverse environmental impacts to avian resources. Potential impacts to habitats were addressed in Section 3.7. Potential impacts were considered significant if they would:

³⁸ Fish and Game Code CCR Title 14, Division , subdivision 1, Chapter 2, Article 4, Section 5.93

- Have a substantial adverse effect, either directly or indirectly through habitat modifications, on any species identified as candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game, or U.S. Fish and Wildlife Service. A substantial adverse effect would occur if the project would:
 - Extirpate (cause local extinction of) a population
 - Cause or contribute to a substantial decrease in the distribution (range) or abundance of a special status or sensitive bird species, substantially diminish or degrade habitat for such a species, reduce such a species' regeneration capacity in existing or historic range, or otherwise reduce the viability of a sensitive or special-status bird species
 - "Take" one or more individuals of a threatened or endangered species
- Interfere substantially with the movement of any native resident or migratory bird species or conflict with established native resident or migratory corridors, or impede the use of native nesting sites.
- Disturb nesting, roosting, rafting, or foraging such that the project results in, or contributes substantially to, a substantial decline in regional (i.e., San Francisco Bay area) abundance of a waterbird community.
- Disturb nesting, roosting, rafting, or foraging such that the project results in, or contributes substantially to, a substantial decline in regional (i.e., San Francisco Bay area) waterbird species diversity.

METHODOLOGY

In general, potential impacts to waterbirds were evaluated based on the likelihood that the various species of birds could be disturbed due to implementation of the WT Plan and the predicted magnitude of such disturbance resulting specifically from the WT Plan implementation relative to the potential reduction in disturbance resulting from improved education of all boaters expected to result from the Plan's educational efforts. Disturbances could occur if WT users approached nesting, foraging, or roosting birds closely enough to elicit an alert or flight response. The impact assessment for waterbirds also evaluated the potential for incidental take. Incidental take could occur if WT users made a planned or unplanned landing and directly damaged a nest, injured a chick or adult, or elicited a predator response that impacted nesting success. However, an important component of the WT Plan is improved education of NMSB users of the WT and WT-related facilities concerning boating practices that avoid and minimize impacts to sensitive ecological resources. As a result, overall education of boaters (including those who would use the Bay specifically due to the WT Plan and the even greater number of boaters who would use the Bay even without the WT Plan) concerning boating practices that would avoid and minimize disturbance of waterbirds or take of sensitive species would increase substantially as a result of the Plan.

As described in Chapter 2, development of the WT is not expected to substantially increase overall use of NMSBs on the Bay, and population growth is likely to be a much stronger driver of increased NMSB use. However, there is some potential for local increases in boating in sensitive areas of the Bay (e.g., areas where waterbirds congregate), or for the boaters who use the Bay solely due to the WT Plan's outreach efforts to disturb waterbirds to some degree.

Increases in NMSB use in such areas could increase energetic costs to waterbirds. At the same time, improved education of all NMSB users would counteract such disturbance by reducing the likelihood that any particular boater would disturb waterbirds. The factors influencing disturbance response, sensitive distances that could be applied to buffer recommendations for WT users, and consideration of site-specific sensitivity of waterbirds to impacts from the WT Plan are described below, followed by a discussion of specific potential impacts of the WT Plan on waterbirds.

DISTURBANCE RESPONSE

In the context of waterbirds and for the purposes of this analysis, “disturbance” includes any human activity that is an intrusion or interruption in the natural, daily activity of an animal (i.e., “normal behaviors”) or that disrupts the abundance, distribution, and function of a waterbird community. Normal behaviors primarily involve foraging or roosting and nesting, though most waterbirds occurring in San Francisco Bay do not breed in San Francisco Bay. In addition, social interaction and community dynamics may be affected. A number of factors contribute to the overall potential for disturbance: potential proximity of a WT trailhead or WT users to a resource, the sensitivity of that resource to disturbance, and temporal/spatial patterns of both disturbance and resource sensitivity.

Waterbird response to intrusion may be similar to anti-predator behavior. The most observable response of waterbirds to disturbance (Ydenberg and Dill 1986, Blumstein 2003) is “flushing,” in which a bird or a group of birds moves away from or flees from an approaching threat. In waterbirds, flushing responses include swimming, diving, or flying and are usually preceded by an alert response (e.g., “head alert”). Because birds may concentrate their activities where there is the best opportunity to maximize energy gain (Davidson and Rothwell 1993), flushing may reduce the time waterbirds spend feeding or resting and cause them to be displaced to less-than-optimal feeding and resting areas (Knapton et al. 2000) or, under increased levels of disturbance, cause complete abandonment of foraging habitat. Repeated flushing increases energy costs to waterbirds, and may have cumulative effects on migratory energy budget and, ultimately, reproductive success (Riffel et al. 1996, Cywinski 2004).

A number of factors contribute to disturbance response by waterbirds, including the following:

- **The size of the area available to the species.** The larger the habitat “patch,” the more refugia are available. Thus, birds foraging in extensive habitat areas such as open waters or mudflats of the Bay are less likely to have to flush long distances when disturbed than birds using small coves.
- **Flock size and diversity.** Mori et al. (2001) found that flight distances (a measure of disturbance response) increase with flock size and species diversity.
- **The “shyness” factor of the species.** Some species are more nervous than others and different species respond differently to disturbances (Burger and Gochfeld 1991, Fitzpatrick and Bouchez 1998). Scaup, scoters, and canvasback, the most abundant waterfowl in the Estuary, are also among the most sensitive (Korschgen and Dalhgren 1992). The shorter the disturbance distance that triggers flight response, the lower the impact of disturbance events, since the birds will tend not to flush unless approached very closely.

- **Size of the species.** Larger animals tend to have greater response distances than smaller animals (i.e., the larger the bird, the greater the distance from the source of disturbance when it takes flight).
- **Behavior of the birds.** Mori et al. (2001) found that flight distances tended to be longer for waterfowl that used open water for feeding than those that used it primarily for resting.
- **Season.** Animals behave differently in the breeding season than in the non-breeding season. Annual periods of high-energy cost (e.g., molting, nesting) put animals at greater risk and may elicit more expensive responses.
- **Daily disturbance patterns and habituation.** In a study of shorebirds on southern California beaches, Lafferty (2001) found that “The average distance that birds reacted to humans increased with the proportion of birds that were disturbed on a particular day, suggesting disturbance sensitized birds.” Waterbird responses to repeated disturbance may be highly variable. In some studies, repeated disturbance caused a proportion of waterbirds to abandon areas previously occupied (Burger and Gochfeld 1991, Klein et al. 1995), and abundance of sensitive species may be reduced by 50 percent at high disturbance levels (Pfister et al. 1992).

On the other hand, some individuals may be tolerant of disturbance; such birds appear to habituate to conditions in areas where human disturbance is ongoing (Cooke 1980, Burger and Gochfeld 1991). Habituation occurs when organisms are exposed to repeated stimuli and cease to respond, or the response level is reduced, thereby preventing needless energy expenditure. Advantages of habituation to wintering waterfowl are “accrued by maximizing time available for maintenance, energy intake (foraging), and energy-conservation (roosting) activity” (Conomy et al. 1998.) or using the available time to preen, forage, and roost rather than flee. Ability of birds to habituate varies by species, social organization, environment and season (Burger 1981, Conomy et al. 1998). Conomy et al. found that “time required to habituate may depend on the frequency and intensity of the disturbance.” In San Francisco Bay, there are a number of sites where high abundance and diversity of waterbirds occurs despite the presence of high levels of disturbance in the form of pedestrian traffic, pets, vehicular traffic, and noise, as birds in these areas have habituated to that disturbance. Examples of such locations include the Palo Alto Baylands, South Bayside System Authority Treatment Plant in Redwood Shores, Shoreline Park in Mountain View, and the San Jose-Santa Clara Water Pollution Control Plant (Steve Rottenborn, H.T. Harvey, pers. obs. June 22, 2010).

- **Direction and speed of approach.** A seminal shorebird study found that birds flushed more frequently when exposed to fast movement or when humans were in close proximity, while birds were able to habituate to human activity (birders or clambers) when they were not being approached directly (Burger 1981). Other studies have found that birds flush more readily when approached directly rather than obliquely (Burger 1981, Burger and Gochfeld 1991, Kramer and Bonenfant 1997, Rodgers and Schweikert 2003). In general, approaches of birds along a shoreline from the water seem to disturb birds more than from the land (Smit and Visser 1993 in Davidson and Rothwell 1993).

Responses of waterbirds to human intrusion can be extremely nuanced. For example, one study found a “chromotropic response” (color-sensitive reaction) to observer clothing: birds flushed more readily, or were harder for the observer to detect, when orange vests were worn by

observers (Gutzwiller and Macum 1993). Therefore, brightly colored watercraft, lifejackets, or clothing may cause greater disturbance levels than intruders of more muted colors.

Several studies have documented a reduction in feeding time due to disturbance by motorized watercraft (Korschgen et al. 1985, Kahl 1991) or experimentally examined flush distances of waterbirds by watercraft (Rodgers and Smith 1997, Peters and Otis 2006). The literature contains fewer studies of disturbance response of waterbirds to non-motorized vessels; however, Rodgers and Schwikert (2003) and Avocet Research Associates (2009) studied responses of waterbirds to approach by NMSBs, identifying varying flush distances depending on the species. Peters and Otis (2006), in a South Carolina study of a tidal creek refuge, found that canoe intrusion caused approximately one-half of individuals of all waterbird species except snowy egret to “immediately abandon” the site, but only two species (yellow-crowned night heron [*Nyctanassa violacea*] and great egret) avoided high-use creeks.

The effects of human disturbance on waterbirds can range from insignificant to lethal for different species and different individuals (Boyle and Sampson 1985, Riffell et al. 1996). Human disturbance may have cumulative impacts that reach population levels, affecting habitat use, reproduction, and survival (Burger 1983, Riffell et al. 1996), and may reduce species diversity and abundance at both the landscape and regional level (Rodgers and Smith 1997). Increasing human use of natural areas increases the incidence of disturbance and tends to disrupt foraging and social behavior of waterbirds (Burger 1981, Klein et al. 1995). It is reasonable to infer that the cumulative impacts of numerous or serial disturbances may have deleterious effects on waterbird populations within a given area; such frequent disturbance may adversely affect the health or productivity of birds that remain in an area where disturbance results in substantial impacts to energy budgets, or may cause birds to leave an area altogether to seek out areas where their energy budgets can be balanced. In either case, the end result may be a decline in local abundance. Compounding impacts may result when the periods between successive intrusions are too short for birds to recover and return to their normal, pre-disturbance behavior. In this way, numerous small disturbances can be more damaging than fewer, larger disturbances (West et al. 2002).

SENSITIVE DISTANCE

Several studies have been conducted to determine the “sensitive distance” of waterbirds (i.e., the distance from a source of disturbance at which the birds flush or show other behavior indicating that they are being disturbed). A study of the impacts of sailboats on waterfowl measured distances at which flocks of ducks moved from an oncoming dinghy; this study found the sensitive distance for the tufted duck (*Aythya fulgula*), a congener and useful surrogate for scaup that use San Francisco Bay, to be 275 m (Batten 1977).

Rodgers and Schwikert (2003) developed a formula for determining sensitive distances that accounts for 95 percent of all flush observations and adds 40 m to account for unmeasured responses that are not observable in the field (e.g., increased heart rate). The addition of 40 m as a safety margin to the calculation of buffer distances is a conservative strategy to minimize adverse disturbance responses by birds before they flush, taking into account variables such as flock size and mixed species assemblages that may increase the sensitive distance (Rodgers and Schwikert 2003).

Following the example provided by studies such as that of Rodgers and Schwikert (2003), Avocet Research Associates (2009) conducted an experimental study of sensitive distances with waterbirds in the North Basin, an enclosed embayment located along the Berkeley shoreline in San Francisco Bay. In this study, the researchers paddled kayaks along transects and measured the flush distances (i.e., the distances at which birds first began to swim, dive, or fly away from the kayaker) of waterbirds, predominantly wintering waterfowl. They then determined the sensitive distances of various species using the conservative formula developed by Rodgers and Schwikert (2003). The sensitive distances in the North Basin study varied considerably among the 15 species for which an adequate sample size was achieved, ranging from 78 m for Clark's grebe (*Aechmophorus clarkii*) to 252 m for lesser scaup (*Aythya affinis*). According to Rodgers and Schwikert (2003), when dealing with mixed species, buffer zones should be based on the largest flush distance of the species most sensitive to human disturbance. Following this principle, Avocet Research Associates (2009) concluded that a buffer zone of 250 m represented a conservative recommendation for a buffer width suitable for minimizing the effects of NMSB activity on rafting waterbirds in the North Basin.

MINIMIZATION OF DISTURBANCE IMPACTS ASSOCIATED WITH WATER TRAIL SITES

The guiding principle of managing human activities in areas that support important waterbird populations is to avoid or limit overlap of human activity with those populations. Avoidance can be accomplished by restricting access (closure) or by implementing buffers (i.e., maintaining appropriate distances from birds). Physical means of designating appropriate buffer distances, such as buoys, would only be applicable in limited instances and may not be feasible. Educating boaters about the need to maintain a certain buffer distance and to not enter sensitive habitat (except if dictated by an emergency) would be more effective at limiting human overlap with important waterbird populations. In cases where NMSB users may not be able to see birds on the water from a distance that would minimize the potential to cause disturbance (e.g., 250 m for rafting waterbirds), those boaters will need to avoid the birds as soon as they are aware of them.

The potential for waterbird disturbance associated with the use of a specific WT site depends on a suite of variables that will differ from site to site and that would be evaluated during the trailhead designation process. By definition, sites that meet HOS criteria would have no or only a very minor potential to cause any additional disturbance to sensitive species compared to the existing baseline.

Measures to minimize potential disturbance of waterbirds at non-HOSs will depend on the specific potential concerns identified. The WT has no direct authority to close sites or restrict access. As recommended in Strategy 24, periodic closure and/or controls on site use may be employed by the site owner/manager if warranted at a specific trailhead. Recommendations for periodic or seasonal site closure could be included in the trailhead plan for a specific site if site-specific analysis indicated that this would be needed to avoid significant impacts.

In addition, the WT would recommend against funding site improvements that could result in added disturbance to waterbirds if no feasible measures are identified to minimize the potential incremental disturbance. Strategy 3 requires that improvements be consistent with site characteristics, in part to prevent uses that are incompatible with wildlife protection. The WT

may also choose not to designate certain sites as WT trailheads. However, any sites not included in the WT would not benefit from the educational and outreach efforts provided through the WT.

REGIONAL IMPACTS AND MITIGATION MEASURES

IMPACT BIO-5: DISTURBANCE OF RAFTING WATERFOWL FROM ROOSTING AND FORAGING HABITAT

Of the diverse waterbird community that depends on San Francisco Bay, rafting waterfowl comprise one of the groups most susceptible to disturbance by watercraft because rafting waterfowl are widespread in the Bay, occur over a range of water depths (including areas fairly close to shore where much NMSB activity is expected to take place), and tend to have relatively high sensitive distances (e.g., 250 m for lesser scaup [Avocet Research Associates 2009]). This impact could be regional in nature, as WT users initiating outings from a variety of trailheads could affect rafting waterfowl.

As described above, movement patterns and foraging behavior of waterfowl represent a balance between costs and benefits of wintering in a human-influenced environment (Reed and Flint 2007). Rafting in dense flocks serves an anti-predator function, a “safety in numbers” strategy for waterfowl and the energetic costs of such disturbance are equivalent whether flocks are flushed by predators or boats. Flush responses can affect waterbirds by resulting in a loss of access to favored feeding areas, loss of feeding time, and additional energetic cost of flight. Mathews (1982) studied water-based recreation in Britain and ranked “sailing, wind-surfing, rowing, and canoeing” as the second greatest cause of disturbance, after power-boating, to wintering waterfowl.

Two primary factors may help to minimize impacts of NMSBs on San Francisco Bay to rafting birds:

- The seasons of least use by wintering waterbirds (May-September) are the time periods when NMSB use is likely to be highest (Cal Boating 2009). Rafting waterfowl abundance peaks in winter, when NMSB use would be lowest.
- Waterbird flocks tend to coalesce (raft) and hug the shore in leeward bays (i.e., in areas close to shore where NMSB use may be highest) when weather conditions are most severe (high winds, choppy water, winter storm surges). These are the periods least likely to be favored by NMSB users.

Nevertheless, if WT site improvements, outreach, or educational activities result in increased use of a site within or near areas of high waterfowl use, that increased use could result in disturbance of waterfowl, possibly in large numbers. Given the number of potential WT sites from which areas frequented by rafting waterbirds are accessible on a day trip, and the relatively large distance required to maintain a buffer against disturbance to species that are more easily disturbed, increased NMSB use could lead to an increase in disturbance of rafting waterfowl. With repeated disturbance in a particularly sensitive area frequented by large numbers of waterfowl, it is possible that the project could result in a substantial decline in regional (i.e., San Francisco Bay area) abundance of these waterfowl, resulting in a potentially significant impact.

However, it is likely that the educational benefits of the WT Plan would counteract potential impacts to rafting waterfowl resulting from implementation of the Plan by also resulting in

boaters who are more aware of the potential impacts of their boating activities on sensitive resources such as rafting waterfowl and who are educated about ways in which such impacts should be avoided or minimized. Education has been shown to be effective at reducing the potential for disturbance to sensitive species. At a southern California beach, erecting signage increased the percentage of the public that could identify snowy plovers from 3 percent to 15 percent; once docents were employed recognition increased to over 80 percent (Lafferty 2001, Lafferty et al. 2006). After implementation of the educational signage and a docent program, disturbance was reduced by more than 50 percent and successful breeding was reestablished. The docent program included reminding people about leash laws and not trespassing into the roped-off plover breeding area, and scaring crows from nests.

Currently, in the absence of the WT Plan, education regarding appropriate boating behavior in sensitive areas may be accomplished by boating organizations on a small scale, but no Bay-wide, comprehensive educational program targeted at NMSB users, and focusing on key issues of greatest ecological importance, exists. Through signage at WT trailheads, brochures, and other materials, the WT would not only educate the small incremental increase in boaters who would begin using the Bay as a result of the WT Plan, but also extend that education to all WT users, even if only at the trailhead(s) that those boaters currently use.

For purposes of impact assessment, only the incremental increase in NMSB users on the Bay, or the increase in use of sensitive areas (such as areas of high waterfowl use), resulting from the WT Plan itself is considered. This incremental increase can then be weighed against the potential reduction in disturbance due to improved education of boaters regarding avoidance of sensitive biological resources to determine whether the WT plan will have a net adverse or beneficial effect. The way in which a reduction in the percentage of NMSB excursions leading to disturbance of waterfowl, as a result of improved education, can offset an increase in Bay users can be demonstrated mathematically. For example:

- Assume that 100 excursions per winter occur in a particular part of the Bay, and that 20 percent of those excursions result in disturbance of rafting waterfowl; waterfowl would then be disturbed by NMSBs 20 times during the winter:
$$(100 \text{ excursions}) \times (0.2) = 20 \text{ disturbances}$$
- If the number of excursions increases by 5 percent as a result of the WT Plan, the disturbance rate (i.e., the percentage of excursions resulting in disturbance of waterfowl) would have to decline by approximately 4.8 percent to maintain the same number of disturbance events:
$$(105 \text{ excursions}) \times [0.2 - (0.048)(0.2)] = 20 \text{ disturbances}$$

The degree to which the disturbance rate would have to decline as a result of improved boater education, in order to offset an increase in excursions, is related to the rate of increase in number of excursions. Therefore, as the number of new users of the Bay increases, the effectiveness of education in reducing the likelihood of waterbird disturbance has to improve as well.

The example above uses a percent increase in boaters that may be above that which would actually occur as a result of implementation of the WT Plan, although the WT Plan does not

provide a specific growth prediction. As discussed in Section 2.2.2 of this EIR, the annual growth rate (in terms of NMSB users on the Bay) of 3.84 percent per year predicted without the WT (Cal Boating 2009) is likely considerably higher than the incremental increase in NMSB users on the Bay that would result from implementation of the WT Plan. Therefore, the five percent increase in excursions used in the example above is an exaggeration of the expected increase in NMSB use of the Bay resulting from the WT Plan. However, it is certainly possible that improved education of all NMSB users (including those who would use the Bay in the absence of the WT Plan) would result in a reduction in the probability of waterbird disturbance far exceeding the percent increase in disturbances due to the WT. Therefore, it is possible that the WT Plan could actually result in a net benefit to waterbirds if educational efforts regarding avoidance and minimization of impacts to sensitive biological resources are appropriate and effective.

Education and public outreach are important components of the WT Plan. Strategies 12, 17, 18, 19, 21, and 22 describe proposed education, outreach, and stewardship programs. Implementation of these strategies would reduce the potential impacts to all waterbird species by educating WT users about the WT ethic. None of the strategies, however, specifically calls for education regarding the need to maintain appropriate buffer zones around rafting waterfowl or regarding the dimensions of those buffers. Therefore, in the absence of such specific information in the educational materials, the potential for increases in disturbance of rafting waterfowl is considered a **potentially significant but mitigable impact**. In addition to siting and design measures that would be implemented during the site-specific evaluation that would be performed during consideration of trailhead designation for a non-HOS site, implementation of mitigation measure Bio-M5 described below would reduce this impact to a less than significant level.

MITIGATION MEASURE BIO-M5: AVOID DISTURBANCE OF RAFTING WATERFOWL FROM ROOSTING OR FORAGING HABITAT

Measures aimed at protecting the two most common open Bay waterfowl groups, scaup (*Aythya* spp.) and scoters (*Melanitta* spp.), from disturbance by watercraft will serve to protect other open water birds. Protection of those species groups provides an umbrella for other rafting waterfowl because grouped together: (1) they tend to occur most abundantly on open Bay waters; (2) they are distributed across both shallow Bay (scaup) and deeper Bay (scoter) habitat; (3) they are among the most sensitive species to disturbance (Takekawa et al. 2008, Avocet Research Associates 2009); (4) their seasonality in San Francisco and San Pablo Bays encompasses that of all other winter rafting waterbirds, and (5) in disturbance trials at the North Basin shoreline near Berkeley, lesser scaup showed the greatest mean response distance of 15 waterbird species flushed by kayaks. Although Takekawa et al. (2008) determined that the species showing a maximum sensitive distance was the surf scoter, and that that distance was 300 m, their study examined the effects of ferry traffic on rafting ducks. Large, noisy, motorized watercraft such as ferries are expected to cause greater disturbance than NMSBs, and therefore the maximum sensitive distance of 300 m identified by Takekawa et al. (2008) may not be pertinent to the issue of disturbance by NMSBs. In contrast, the study by Avocet Research Associates (2009) determined sensitive distances in response to flushing by a kayak, which is more relevant to the WT Plan than the study of ferry disturbance. Therefore, for the purpose of Mitigation Measure Bio-M5, a sensitive distance (i.e., buffer) of 250 m, based on the greatest sensitive distance

identified by Avocet Research Associates (2009), would be adequate to minimize impacts of WT users to all rafting birds.

Educational materials prepared by the WT in accordance with WT Strategy 17, including brochures, signage, and the WT website, shall inform WT users about the importance of the San Francisco Bay Estuary to populations of rafting waterfowl, the sensitivity of waterbirds (and other wildlife) to disturbance, the potential effects of repeated disturbances to such birds, the need to avoid approaching rafting waterbirds, and the need to maintain a 250-m non-disturbance zone (buffer) around congregations of waterbirds. Exceptions to this buffer distance shall be considered in cases where NMSBs may be directed into shipping channels or other navigational dangers, or where unfavorable natural conditions, such as dense fog or wave chop, obstruct the line of sight of a NMSB user. In such cases, a reduced buffer may be acceptable, but NMSB users would be encouraged to move steadily through, parallel to, or away from such an area, as would be safest and most appropriate to the circumstances, to reduce any disturbance to rafting waterfowl as soon as would be practicable. Educational materials shall identify areas where rafting birds are likely to congregate seasonally.

The WT shall develop a set of training materials that can be used to train staff of kayak rental companies and other NMSB outfitters, as well as docents, park staff, and others who may be working at trailhead locations about sensitive bird species and appropriate measures to minimize disturbance. Training sessions provided by kayak rental companies and other NMSB outfitters working in association with designated trailheads and the WT program shall include this educational component. Strategies 17, 18, 19, and 21 shall be modified to include this training and education component.

IMPACT BIO-6: DISTURBANCE OF WADING BIRD, SHOREBIRD, AND BROWN PELICAN ROOSTING AND FORAGING HABITAT

The project may result in increased boating activity at WT sites that could result in disturbance to roosting and foraging activities of wading birds (including egrets, herons, and night-herons), shorebirds (including western snowy plovers and black oystercatchers), California least terns, elegant terns, Caspian terns, Forster's terns, California gulls, and California brown pelicans. Direct flushing responses to disturbance may affect over-wintering fitness by altering site use. As discussed earlier, Peters and Otis (2006), in a South Carolina study of a tidal creek refuge, found that canoe intrusion caused approximately one-half of individuals of all waterbird species except snowy egret to "immediately abandon" the site, but only two species (yellow-crowned night heron [*Nyctanassa violacea*] and great egret) avoided high-use creeks.

For the most part, wading birds and shorebirds would be protected from NMSB disturbance because of their habitat preference for tidal flats or very shallow (less than 10 cm) water, which are undesirable use areas for NMSBs. High tide roosts, however, may be susceptible to disturbance during periods of high water. Small numbers of long-legged waders (e.g., egrets and herons) that forage in shallow water may be flushed by shallow-draft watercraft, but this is likely to be a limited occurrence. In addition, WT education and public outreach strategies are expected to sensitize users to disturbance issues and further buffer flocks from close approach by watercraft. Therefore, this impact would be **less than significant** for shorebirds and wading birds and no mitigation is required.

During the non-breeding season, pelicans can flush at significantly greater disturbance distances than during the breeding season; these distances have been measured to be over 27 m for approaching walking humans and over 34 m for approaching motor boats (Rodgers and Smith 1997). Pelicans roosting in shallow inland ponds at Elkhorn Slough flushed at a mean distance of 220 m when approached by humans on foot whereas approaches within 50 m were tolerated at roosts on Año Nuevo Island surrounded by deep water (Jaques and Anderson 1994), implying that the pelicans perceived protection afforded by the island. Nevertheless, there is potential for NMSB users on San Francisco Bay to adversely affect brown pelican use of the Bay. While occasional disturbance of a roost is not likely to cause changes in Bay-wide numbers, repeated disturbances of major roost sites could possibly lead to declines in regional abundance in an area (USFWS 1983). Although the California brown pelican is no longer listed under the federal or state Endangered Species Acts, continued protection of this species' roosts will be important to sustaining this species' recovery in the long term. Therefore, the potential impact to roosting brown pelicans from the WT Plan is **potentially significant but mitigable**.

For the same reasons described in Impact BIO-5 and the Methodology section above, education of NMSB users regarding the need to avoid, and ways of avoiding, impacts to roosting pelicans is expected to minimize or completely offset any adverse effect resulting from the very small incremental increase in Bay users resulting from the WT Plan. However, WT strategies pertaining to education do not yet specifically require inclusion of California brown pelican avoidance measures. Implementation of mitigation measure Bio-M6 described below would reduce this impact to a less than significant level.

MITIGATION MEASURE BIO-M6: AVOID DISTURBANCE OF CALIFORNIA BROWN PELICANS FROM ROOSTING AND FORAGING HABITAT

The educational materials to be developed for the WT, described in Mitigation Measure BIO-M5 above, shall also alert WT users to the sensitivity of roosting California brown pelicans and appropriate buffer zones. Buffer zones necessary to protect brown pelicans from disturbance have not been well established. However, educational materials for the WT Plan shall recommend a buffer of 50 m between boaters and pelican roosts; this buffer distance may be varied (either increased or decreased) if more information on sensitive distances of roosting pelicans in San Francisco Bay becomes available. Exceptions to this buffer distance shall be considered in cases where NMSBs may be directed into shipping channels or other navigational dangers; in such areas, a reduced buffer may be acceptable, but NMSB users would be encouraged to move steadily through such an area rather than lingering where they could disturb roosting brown pelicans. Strategies 17, 18, 19, and 21 shall be modified to include this training and education component.

In addition, siting and design measures that would be implemented during the site-specific evaluation that would be performed during consideration of trailhead designation for a non-HOS site shall include California brown pelican roosting sites as a potential sensitive resource requiring further evaluation if present.

IMPACT BIO-7: DISTURBANCE OF BIRD NESTING HABITAT

Increased watercraft traffic along the margins of the Bay may impact nesting birds by disturbing or displacing individuals or groups from nesting habitat. Nesting birds, especially those in colonies, can be more sensitive to disturbance than resting and foraging birds. There is considerable variation in the response to disturbance among colonies depending on site characteristics, colony size, species composition, and time of year. Inadvertent disturbance of nest sites could occur if NMSB users landed onshore and disembarked on a levee, salt flat, or island that supported nest sites. For example, a single person disembarking in summer on an island where night-herons were nesting (e.g., Red Rock) could flush incubating adults and subject the colony to predation of eggs by gulls. Various studies have recommended buffer zones around wader colonies ranging from 100 to 300 m (Erwin 1989, Butler 1992). Kelly et al. (2006) recommend buffer zones of 100 to 200 m around colonies of large waders based on responses of nesting birds to a single person approaching on foot, but with a caveat that larger groups of people (or boats) are likely to disturb colonies at greater distances.

Western snowy plovers are not expected to nest in areas where they can be disturbed by boaters on the Bay or in tidal channels. However, if boaters disembark near salt ponds or levees used by nesting snowy plovers, disturbance of nests may result. If adults leave a nest due to disturbance by NMSB users, predation by California gulls, common ravens (*Corvus corax*), northern harriers, or red-tailed hawks (*Buteo jamaicensis*), species that have been documented preying on snowy plover nests and young in the San Francisco Bay area (<http://vimeo.com/11724291>), could result. The USFWS (2008) recommends buffers of approximately 100 m between pedestrians walking on levees and snowy plover nesting habitat, and 200 m between areas of longer-term human activity (i.e., staging areas or vista points) and nesting habitat.

Burrowing owls are terrestrial, and are not expected to nest in wetlands near waters used by boaters. However, as described for western snowy plovers, it is possible that boaters disembarking near upland areas supporting nesting burrowing owls could result in disturbance of active nests. While occasional disturbance may be tolerated by individual owls (i.e., would not likely cause the abandonment of a nest or roost site), repeated disturbance in an area may cause an owl to abandon that site. The CDFG (1995) recommends a buffer of at least 75 m around active burrowing owl nests.

Specific travel patterns and distances traveled by NMSB users will vary, depending on the particular location of a launch or destination site, tides, weather, and other factors. Thus, the determination of whether NMSB users associated with a particular WT Backbone Site may disturb nesting habitat has to be made on a site-specific basis. The trailhead designation process that would be used for all sites would identify sites that are located in close proximity to known nesting sites and nesting habitat.

The trailhead designation process preliminary CEQA checklist includes nesting habitat for wading birds, shorebirds, and burrowing owls as a potential sensitive resource requiring further evaluation if present. For the same reasons described for Impact BIO-5 above and the Methodology description, education of NMSB users regarding the need to avoid, and ways of avoiding, impacts to nesting birds is expected to minimize or completely offset any adverse effect resulting from the very small incremental increase in Bay users resulting from the WT Plan. As discussed above for Impact Bio-M5, various WT strategies call for education of NMSB

users; however, the strategies do not specifically recommend education pertaining to avoidance and appropriate buffer zones for nesting birds. Therefore, this impact is **potentially significant but mitigable**. Implementation of Mitigation Measure BIO-M7 will reduce this impact to less than significant levels.

MITIGATION MEASURE BIO-M7: AVOID DISTURBANCE OF BIRD NESTING HABITAT

Educational materials prepared by the WT in accordance with WT Strategy 17, 18, 19 and 21, as modified per Mitigation Measure BIO-M5 above, shall include discussion of nesting wading birds, western snowy plovers, and burrowing owls, including appropriate buffer distances for these birds. In these educational materials, buffer distances of 200 m for nesting waders and western snowy plovers and 75 m for nesting burrowing owls shall be recommended. These buffers may be modified if new information on appropriate buffer distances becomes available. Exceptions to these buffer zones shall be considered in cases where NMSBs may be directed into shipping channels or other navigational dangers; in such areas, a reduced buffer may be acceptable, but NMSB users shall be encouraged to move steadily through such an area rather than lingering where they could disturb these sensitive species. These educational materials shall generally identify areas where nesting waterbirds are known to occur and shall stress that boaters should not disembark in those areas. These materials shall be developed in a manner that will minimize the likelihood of inadvertently draw NMSB users to these areas.

In addition, where wader colonies, snowy plover nesting areas, or burrowing owl nesting areas are particularly susceptible to disturbance by users of a given WT trailhead, appropriate signage at the trailhead shall discuss the importance of avoiding, and ways for boaters to avoid, impacting these species, including appropriate buffer zones. At a minimum, appropriate signage and educational materials shall be required at WT sites within four miles of wader nesting colonies at West Marin Island, Red Rock, and any colonies to be established or recolonized (e.g., on Bair Island) in the future.

IMPACT BIO-8: DISTURBANCE OF CALIFORNIA CLAPPER RAILS AND CALIFORNIA BLACK RAILS

Small watercraft entering a channel system are likely to flush or otherwise disturb marsh birds and adversely affect nesting success. This impact applies especially to the California clapper rail. The clapper rail is the largest of the special-status marsh birds, the most endangered, and the most sensitive to disturbance. Clapper rails flushed from vegetative cover are susceptible to increased exposure and predation (Evens and Page 1986, Albertson and Evens 2000).

Clapper rails have territories that encompass the dendritic channel systems that develop in a large marsh. The intertidal portions of the channels provide foraging opportunities, but the nest sites are located at or above mean high tide elevations, often at the headward extent of the channel system, or on the upper marsh plain, under dense vegetation (e.g., gumplant bushes). These nest sites are most often immediately adjacent to a channel, many of which are navigable by shallow-draft NMSBs. Human intrusion into tidal marsh habitat where clapper rails are actively nesting would likely disturb incubating or brooding birds, potentially reducing reproductive success. If NMSB users disembarked in a marsh occupied by clapper rails, they could disturb breeding pairs (possibly to the point of abandonment of nests, eggs, or young) and possibly destroy active nests, which are often located along the edges of channels that may be used by boaters. A lost nesting

effort, even by a single pair, may have population-level implications for this critically-endangered species.

California black rails, which are limited primarily to Suisun Bay and San Pablo Bay marshes, are much smaller than California clapper rails and do not flush nearly as frequently in response to human approach or disturbance. However, disturbance by NMSB users, especially if they disembarked in a marsh occupied by black rails, could disturb breeding pairs (possibly to the point of abandonment of nests, eggs, or young) and possibly destroy active nests.

NMSB users may also impact these two listed species during the nonbreeding season. During very high winter tides, clapper and black rails are often concentrated in limited high-tide refugia or narrow upland transition zones just above the water line in or at the edges of marshes. During such events, these species are particularly vulnerable to predation by mammals and raptors (and, in the case of the black rail, by gulls, corvids, and large wading birds). If NMSB users approach high-tide refugia during such extreme tides, they may flush rails into areas where the likelihood of predation would increase.

Specific NMSB travel patterns vary depending on site-specific factors, as discussed previously. Thus, the determination of whether NMSB users may disturb California clapper rails, California black rails, or their nesting habitat has to be made on a site-specific basis. The trailhead designation process that would be used for all sites would identify sites that are located in close proximity to known or potential clapper rail or black rail habitat.

As described in the Methodology section, and for the same reasons discussed for Impact BIO-5 above, education of NMSB users regarding the need to avoid, and ways of avoiding, impacts to California clapper rails and California black rails is expected to minimize or completely offset any adverse effect resulting from the very small incremental increase in Bay users resulting from the WT Plan. As discussed above, WT Strategies 17, 18, 19 and 21 call for education of NMSB users; however, the strategies do not specifically recommend education pertaining to avoidance and appropriate buffer zones for these two listed species. Therefore, this impact is **potentially significant but mitigable**. Implementation of Mitigation Measure BIO-M8 will reduce this impact to less than significant levels.

MITIGATION MEASURE BIO-M8: AVOID DISTURBANCE OF CALIFORNIA CLAPPER RAILS AND CALIFORNIA BLACK RAILS

Educational materials prepared by the WT in accordance with WT Strategy 17, as described for Mitigation Measure BIO-M5 above, shall include discussion of California clapper rails and California black rails. This discussion shall include the laws protecting these listed species, habitat used by these species, the importance of avoiding both nesting habitat and high-tide refugia (during extremely high tides), the importance of not physically entering any vegetated marsh supporting these species, and appropriate buffer distances for these birds. There is no universally recognized buffer distance that has been identified for avoiding disturbance of these two species. For the South Bay Salt Ponds Restoration Project, the USFWS (2008) recommended a 700-foot buffer between construction activities and clapper rail habitat during the breeding season (January through August [USFWS 2000]). Although noise and activity associated with NMSB users is substantially less than that associated with construction activities,

NMSB users have the potential to approach very close to the marsh habitat along tidal channels that is most important to clapper rails, or even enter marshes that support rails via smaller channels. Therefore, the WT's educational materials shall indicate that a 50-ft buffer from clapper rail and black rail habitat should be maintained during the breeding season, and that a 50-ft buffer from high-tide refugia during extremely high winter tides should be maintained by NMSB users. During other periods of the year and non-high-tide events, boaters should not land on or disembark into vegetated marshes that could support rails.

This distance is based in part on the average widths of interior channels within high-quality marshes known to support clapper rails (e.g., at Greco Island); such channels are typically 100 ft wide or less, and thus maintaining a 50-ft buffer from marshes that support rails would preclude NMSB users from entering such marshes, and disturbing rails, during the breeding season. This distance also takes into account the average width of channels at which boat launches are located, which are usually more than 100 ft wide (and would thus allow NMSB users traveling down the center of the channel to remain at least 50 ft from rail habitat at the marsh edge). During extremely high winter tides, when much of the marsh plain is inundated and determining the locations of channels, or even the marsh edge, may be difficult, NMSB users should remain at least 50 ft from the edge of the marsh, as demarcated by either emergent or inundated vegetation or other features that may be visible, and they should not approach vegetation that is not inundated during those times. Exceptions to these buffer zones shall be considered in cases where a launch is located within a channel that is less than 100 ft wide, or when NMSBs adhering to such buffers would be directed into shipping channels or other navigational danger; in such areas, a reduced buffer may be acceptable, but NMSB users would be encouraged to move steadily through such an area rather than lingering where they could disturb these two listed rails.

In addition, if WT trail segments occur in areas where clapper or black rails are particularly susceptible to disturbance by users of a given WT trailhead, appropriate signage at the trailhead shall discuss the importance of avoiding, and ways for boaters to avoid, impacting these species. Federal and state laws prohibiting "take" of these species shall be included in this signage. In cases of anticipated increased use during the prescribed nesting season, which is generally February through August, feasible methods by which watercraft traffic shall avoid channel systems used by nesting rails shall be specifically identified during the trailhead designation process; these methods shall be included in educational materials and signage for these trailhead locations.

IMPACT BIO-9: DISTURBANCE OF NON-LISTED MARSH BIRDS

In addition to the federally listed California clapper rail and state listed California black rail, a number of other, non-listed bird species use tidal marshes where NMSB activities may occur. These include common breeding species such as marsh wrens (*Cistothorus palustris*) and red-winged blackbirds (*Agelaius phoeniceus*) as well as special-status species such as Suisun, San Pablo, and Alameda song sparrows, San Francisco common yellowthroats, and northern harriers, all of which are considered California BSSC. Boating activities during the breeding season that occur adjacent to, or in channels within, tidal marshes could result in disturbance of nesting pairs of these species, possibly leading to nest abandonment. Boaters who disembark within tidal

marsh habitat could also physically disturb or destroy active nests or degrade habitat used by these species.

Because the incremental increase in NMSB use expected to result from implementation of the WT Plan is expected to be very low, the effects of implementation of the WT Plan on these non-listed species and their habitats are also expected to be fairly low. Although the list of marsh bird species above includes several BSSC, these species are much more abundant and/or widespread than the California clapper rail and California black rail considered in Impact BIO-8. As a result, any adverse effects of NMSB use resulting from implementation of the WT Plan would impact only a very small proportion of the regional populations of these BSSC, and such impacts would be **less than significant**. In addition, the educational outreach components of the WT Plan, and specifically implementation of Mitigation Measure BIO-M8 for the two listed rail species, will further reduce the potential for the WT Plan to impact these non-listed marsh birds.

IMPACT BIO-10: POTENTIAL INCIDENTAL TAKE OF SENSITIVE SPECIES

As described in Section 3.2, take means to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct,” and includes significant habitat alteration where such alteration kills or injures a listed species through impairment of essential behavior.” Harass means “an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering.”³⁹ Incidental take could occur if WT users damage nests; step on eggs or chicks or small animals such as a salt marsh harvest mouse; disturb adults of any species so that predators can gain access to the young; or flush birds to such a degree that fitness is impaired. Incidental take could also result from habitat damage, as discussed and addressed in Section 3.7. Increased NMSB use could lead to an increase in incidental take. This impact is **potentially significant but mitigable**. The potential forms of incidental take are addressed individually in Impacts Bio-5 through Bio-8. Implementation of Mitigation Measures Bio-M5, Bio-M6, Bio-M7, and Bio-M8 would reduce this potential impact to a **less than significant** level.

SITE-SPECIFIC IMPACTS AND MITIGATION MEASURES

IMPACT BIO-11: DISTURBANCE OF CALIFORNIA CLAPPER RAILS AND CALIFORNIA BLACK RAILS DUE TO CONSTRUCTION ACTIVITIES AT LAUNCH SITES

Percussive noise, night lighting, and physical alteration of tidal marsh or adjacent upland habitats are all potential construction activities that could disrupt marsh bird nesting behavior. For non-listed species, construction activity at any particular site could impact at most only a very small proportion of the regional population of the species, and such an impact would therefore be less than significant. However, for state and federally listed species, including the California clapper rail and California black rail, any impact that could result in a loss of reproductive effort due to construction disturbance at a trailhead could have more substantial effects given the very low sizes of these species’ regional populations. This impact applies to non-HOSS; HOS site construction would be minimal (signage only) and not anticipated to have significant construction-related impacts to marsh birds.

³⁹ 50 C.F.R 17.3

As determined by the USFWS, construction activities that occur from February 1 through August 31 within 700 feet of the center of a clapper rail territory may have adverse impacts on nesting success (James Browning, USFWS, pers. comm. May 27, 2008). Clapper rail protection requirements, when implemented, would also avoid potential construction-related disturbance of California black rails and other marsh birds.

WT site sensitivity to potential construction-related disturbances of marsh birds will vary greatly from site to site. The trailhead designation process will identify the potential presence of sensitive species and/or habitats near trailheads. This impact is **potentially significant but mitigable**.

MITIGATION MEASURE BIO-M11: AVOID DISTURBANCE OF CALIFORNIA CLAPPER RAILS AND CALIFORNIA BLACK RAILS DUE TO CONSTRUCTION ACTIVITIES AT LAUNCH SITES

The trailhead designation process shall include evaluation of the potential for construction to adversely affect sensitive marsh bird habitat. If presence of nesting California clapper rails or California black rails is possible, either protocol-level surveys shall be conducted during the appropriate season (i.e., between January 15 and April 15 for the clapper rail [USFWS 2000] and between March 15 and May 31 for the black rail [PRBO undated]), or it may be assumed that rails are present. If either species is determined or assumed to be present within 700 feet of the construction area, construction shall be scheduled to occur only from September 1 through January 31 (or as otherwise modified with approval of the USFWS and CDFG) to avoid the nesting season.

3.9 BIOLOGICAL RESOURCES – OTHER SPECIES

This section discusses the existing sensitive biological resources of San Francisco Bay, other than birds and vegetation, that could be affected by project-related construction and increases in NMSB use, identifies potential impacts to those resources, and recommends mitigation strategies to reduce or eliminate those impacts. Two categories of sensitive species are addressed in this section: aquatic mammals and non-avian marsh wildlife.

3.9.1 INITIAL STUDY FINDINGS

The Initial Study for this project identified potentially significant impacts on harbor seals and wetland habitats. Impacts to wetland habitats could impact sensitive non-avian marsh wildlife present in the wetlands. Potential impacts to other biological resources that were identified in the Initial Study were discussed in Sections 3.7 and 3.8, above.

3.9.2 REGIONAL SETTING

REGIONAL HABITATS

As discussed in Section 3.7, the vegetation and wildlife of bayland environments vary among geographic subregions in the Bay (Figure 3.7.2-1). Potential impacts to other species, including aquatic mammals, and other (non-avian) marsh species, were evaluated in the context of the four major subregions, and specific sensitive habitats. Aquatic mammals are discussed first, followed by other marsh species.

SENSITIVE SPECIES

AQUATIC MAMMALS (HARBOR SEALS)

Pacific harbor seals (*Phoca vitulina*) are the only marine mammals resident in San Francisco Bay year-round. Harbor seals are federally protected under the Marine Mammal Protection Act and are present throughout San Francisco Bay. California sea lions (*Zalophus californianus*) use the Bay seasonally for foraging, and some individuals (primarily males) use one haul-out site located on floating docks at Pier 39 on the San Francisco city shoreline. This haul-out site is currently located in a busy, urban area, surrounded by active boat docks and high levels of tourist activity. The site is monitored by staff and volunteers of The Marine Mammal Center (Sausalito, CA). Other marine mammals are occasionally and briefly seen in San Francisco Bay waters, including harbor porpoise (*Phocoena phocoena*), gray whales (*Eschrichtius robustus*), humpback whales (*Megaptera novaeangliae*), northern elephant seals (*Mirounga angustirostris*), and sea otters (*Enhydra lutris*). These individuals do not reside in the Bay (Thompson et al. 2007).

Based on bone evidence from archaeological sites along the Bay shoreline (Nelson 1909), harbor seals have been using the Bay for thousands of years, and it still supports a year-round population of more than 600 harbor seals⁴⁰ (Green et al. 2006). Harbor seals regularly move onto offshore or intertidal rocks, sand bars, sandy beaches, or tidal mudflats in order to rest between foraging trips, molt, thermoregulate, or nurse their young (Bigg 1981). Seals tend to congregate on the same terrestrial sites, called “haul-out sites,” year after year (Yochem *et al.* 1987,

⁴⁰ This incorporates Green et al.’s (2006) uncorrected figure of >500 seals, multiplied by a standard correction factor for California harbor seal counts of 1.3 (Hanan 1996, Forney et al. 2001).

Harkonen 1987). Such areas are characterized by ease of access to the water, proximity to food resources, and minimal disturbance levels (Allen 1991, Nordstrom 2002).

Although some haul-out sites are used year-round by seals, others are used seasonally, for pupping, molting, or because of proximity to a seasonally abundant prey resource. Estuarine sites such as those in San Francisco Bay may be particularly important to seals during the pupping and molting seasons, as these areas provide sites sheltered from storms (Brown and Mate 1983, Kopec and Harvey 1995). Depending on season, harbor seals spend up to 60% of their time on the haul-out site, with more time spent on land during the pupping and molting seasons (Thompson et al. 1989, Thompson et al. 1998).

Harbor seals exhibit strong site fidelity within season and across years, and are essentially central-place foragers, usually foraging close to haul-out sites and repeatedly visiting specific foraging areas (Thompson et al. 1998). Based on radiotelemetry studies, seals in San Francisco Bay forage mainly within one to five kilometers (km) of a haul-out site (Torok 1994, Nickel 2003; Grigg 2008). Disturbance by humans, both inadvertent and deliberate, has been shown to cause declines in numbers of seals using terrestrial haul-out sites (Orr 1965, Terhune and Almon 1983, Allen et al. 1984, Hanan 1996). If it is sufficiently disruptive, disturbance may cause seals to abandon traditional haul-out sites (Newby 1973, Paulbitski 1975, Allen 1991).

Harbor seals consistently use 16 haul-out sites in the Bay (Kopec and Harvey 1995, Green et al. 2006), hereafter referred to as “primary” sites. There are indications, based on anecdotal reports, documentation of radio-tracked animals, and aerial surveys (Torok 1994, Kopec and Harvey 1995, Nickel 2003, Green et al. 2006) that seals use an additional 11 sites in San Francisco Bay with some consistency (hereafter referred to as “secondary” sites). The primary and secondary haul-out sites are listed in Table 3.9.2-1 and displayed in Figure 3.9.2-1. Most haul-out sites are in the Central and South Bay subregions. Of the 16 primary sites, three (Castro Rocks, Yerba Buena Island, and Mowry Slough) support the highest consistent numbers of seals, often exceeding 100 seals onsite (Kopec and Harvey 1995, Green et al. 2006).

Although most haul-out sites in San Francisco Bay are used to some degree year-round, numbers of seals at some sites are highest during the pupping (March – May) and molting (June-July) seasons (Kopec and Harvey 1995, Green et al. 2006). Sites used by seals for pupping are identified in Table 3.9.2-1. Two of these sites, Castro Rocks and Mowry Slough, are the largest pupping sites in San Francisco Bay. In recent years, small numbers of pups have been born each year at Yerba Buena Island (maximum of 14 pups in 2009) and Coyote Creek (maximum of 20 pups in 2010), but at this time these are not considered primary pupping sites for San Francisco Bay (Green et al. 2006; S. Allen, D. Greig and J. Ryan, pers. comm.). Count surveys are often conducted at times of year when the number of seals on the haul-out site is expected to be at a maximum; in San Francisco Bay, this is generally during the pupping or molting seasons.

Quantitative baseline information on current levels of disturbance are available for four haul-out sites: Castro Rocks, Yerba Buena Island, Mowry Slough and Newark Slough (Table 3.9.2-2). Haul-out disturbance surveys are generally conducted at tide heights/time of day when the maximum numbers of seals are expected to be onsite. Over a period of days or weeks, observers record the number of seals present, all potential disturbance events (e.g., loud construction

TABLE 3.9.2-1. HARBOR SEAL HAUL-OUT SITES BY SAN FRANCISCO BAY SUBREGION AND SEGMENT

Goals Project Subregion*	Primary Haul-Out Sites	Secondary Haul-Out Sites	Known Pupping Sites
Suisun	Ryer Island (RI)	--	--
North Bay	--	Tubbs Island (TI)--	--
Central Bay	Corte Madera (CM) Bluff Point (BP) Point Ione (PI) Point Blunt (PBL) Sausalito Boatworks (SB) Castro Rocks (CR) Yerba Buena Island (YBI) Brook's Island (BI)	Peninsula Point (PP) Alcatraz (AL) Alameda Breakwater (AB) Red Rock (RR) Treasure Island (TR)	Corte Madera (CM) Castro Rocks (CR)
South Bay	Bair Island (BA) Corkscrew Slough (CS) Greco Island (GI) Guadalupe Slough (GS) Newark Slough (NS) Mowry Slough (MS) Coyote Creek (CC)	Coyote Point (CO) Belmont Slough (BS) Drawbridge (DR) Calaveras Point (CP) Union City Shoreline (UC)	Bair Island (BA) Corkscrew Slough (CS) Greco Island (GI) Newark Slough (NS) Mowry Slough (MS)

**TABLE 3.9.2-2. RECENT MAXIMUM COUNTS AT FOUR PRIMARY SAN FRANCISCO BAY
HAUL-OUT SITES, BY SEASON**

Haul-Out Site	Season	2001 ¹	2002 ¹	2003 ¹	2004 ¹	2005 ¹	2006 ²	2007 ³	2008 ⁴	Mean ± sd
Castro Rocks	Pupping	172	166	248	271	268	339	213	262	242 ± 57
	Molting	172	187	248	238	219	nd	109	145	188 ± 51
	Fall	205	180	213	336	nd ⁵	nd	nd	nd	234 ± 70
	Winter	225	296	388	594	nd	nd	nd	nd	376 ± 160
Yerba Buena Island	Pupping	156	163	180	129	172	81	nd	161	149 ± 34
	Molting	184	226	214	177	194	190	nd	199	198 ± 17
	Fall	135	98	208	164	nd	nd	nd	nd	151 ± 46
	Winter	238	206	343	217	nd	nd	nd	nd	251 ± 63
Mowry Slough	Pupping	270	367	295	290	212	229	50	101	227 ± 105
	Molting	213	221	257	236	210	161	15	85	175 ± 84
	Fall	53	60	49	55	nd	nd	nd	nd	54 ± 5
	Winter	112	106	90	139	nd	nd	nd	nd	112 ± 20
Newark Slough	Pupping	59	77	29	23	20	38	17	43	38 ± 21
	Molting	34	26	28	24	10	9	0	20	19 ± 11
	Fall	31	14	20	16	nd	nd	nd	nd	20 ± 8
	Winter	22	22	30	13	nd	nd	nd	nd	22 ± 7

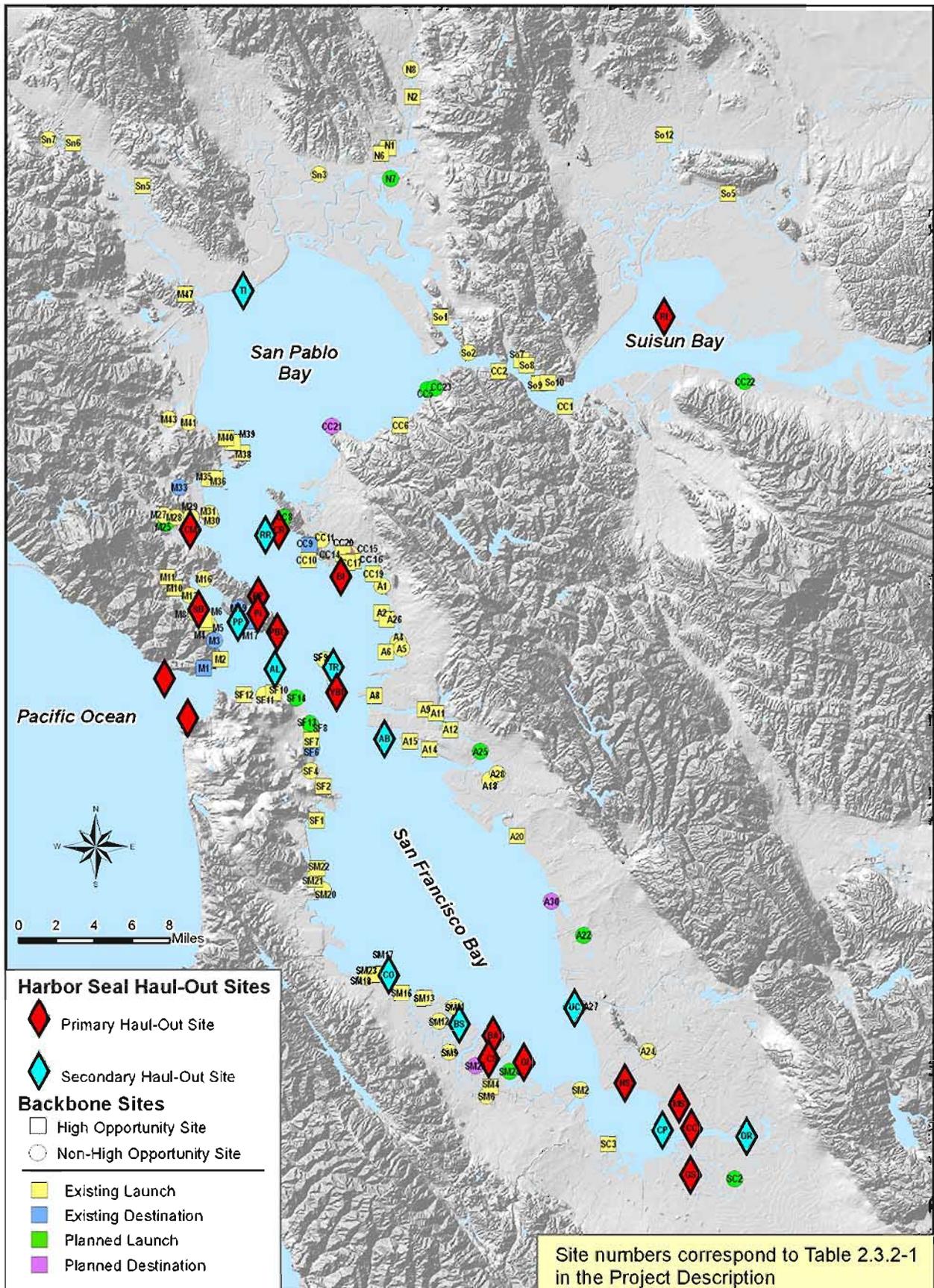
¹Source: Green, D.E., Grigg, E.K., Allen, S.G. and Markowitz, H. (2006) Monitoring the potential impact of the seismic retrofit construction activities at the Richmond San Rafael Bridge on harbor seals (*Phoca vitulina*): May 1, 1998 – September 15, 2005. Final Report to the California Department of Transportation, Contract 04A0628. 100 p.

²Source: Manna, J, Roberts, D., Press, D. and Allen, S. (2006) Harbor seal monitoring. San Francisco Bay Area. National Park Service Annual Report. Point Reyes National Seashore, Point Reyes, CA. 22 p.

³Source: Truchinski, K, Flynn, E., Press, D., Roberts, D. and Allen, S. (2008) Pacific harbor seal (*Phoca vitulina richardii*) monitoring at Point Reyes National Seashore and Golden Gate National Recreation Area: 2007 Annual Report. National Park Service Natural Resource Technical Report NPS/SFAN/NRTR-2008/118. 26 p.

⁴Source: Flynn, E., Press, D., Codde, S., Roberts, D. and Allen, S. (2009) Pacific harbor seal (*Phoca vitulina richardii*) monitoring at Point Reyes National Seashore and Golden Gate National Recreation Area: 2008 Annual Report. National Park Service Natural Resource Technical Report NPS/SFAN/NRTR-2009/267. 24 p.

⁵nd = no data available for this site during this season/year



**Figure 3.9.2-1
Harbor Seal Haul-Out Sites**

Bay Water Trail GIS data provided by BCDC
Harbor seal data from Green et al. 2006



noises, or approaches by watercraft, including distance of approach), reaction of the seals, and number of seals to re-haul following a flush (i.e., seals moving away from resting spots into the water) off the haul-out site.

The San Francisco Bay harbor seal population is currently considered stable (in contrast to increasing seal populations along the outer California coast) at about 600 seals, although increases have been seen at some sites (e.g., Castro Rocks, Yerba Buena Island, and Ryer Island in Suisun Bay) and decreases at others (e.g., Strawberry Spit in Richardson Bay, now abandoned by seals; Allen 1991, Green et al. 2006). Recent (2001 – 2009) seasonal maximum counts at four important harbor seal haul-out and pupping sites are shown in Table 3.9.2-2. The 2006 through 2008 data are based on fewer surveys and are not completely comparable to the 2001 through 2005 data (E. Grigg, pers. comm. January 27, 2010).

Disturbance to haul-out sites is often cited as one potential reason for the lack of overall population increase in San Francisco Bay, in contrast with the increases seen on the outer coast (Allen 1991, Kopec and Harvey 1995, Lidicker and Ainley 2000, Grigg et al. 2004, Green et al. 2006). The Castro Rocks, Yerba Buena Island, Mowry Slough and Newark Slough primary haul-out sites were part of recent (1998 – 2005) monitoring by San Francisco State University and Caltrans (Green et al. 2006). Mean numbers of disturbances and flushes per hour of field time (1998 – 2005) from all disturbance sources were as follows:

- Castro Rocks (daytime)⁴¹: 3.22 disturbances/hr, 0.44 flushes/hr
- Yerba Buena Island: 6.21 disturbances/hr, 0.38 flushes/hr
- Mowry Slough (includes disturbances at Newark Slough): 0.33 disturbances/hr, 0.10 flushes/hr

As can be seen in the rates of disturbance at these three index sites, average rates of disturbance could be expected to be higher in areas nearest urban centers (such as Castro Rocks and Yerba Buena Island), and markedly lower in remote sites such as Mowry and Newark Sloughs, which are located on wildlife refuge land. In some populated areas, harbor seals may habituate to consistent levels and types of disturbance in the area (Bonner et al. 1973, Osborn 1985, Barad et al. 1998). As a result, seals at more remote sites will be less tolerant of disturbance than at sites in more heavily populated areas.

Seals on a haul-out site may be particularly sensitive to disturbance from paddled boats, and frequencies of flushing and disturbance distances from seal haul-out sites for kayaks and canoes are comparable to or even greater than those observed for powered vessels (Suryan and Harvey 1999, Henry and Hammill 2001, Green et al. 2006). For example, in one study conducted in coastal Maine, 55% of paddled boats traveling past (and within approximately 200 m of) a harbor seal haul-out site caused seals to flush, vs. 11% of motorboats approaching within the same distance (Lelli and Harris 2001). The authors concluded that paddled boats were significantly more likely than motor boats to flush seals ($p < 0.05$). Lelli and Harris (2001) noted that the seals commonly left the haul-out site in response to paddled boats over 300 m away, while this was virtually never the case with motorboats. Similarly, another study conducted in

⁴¹ Note that the Castro Rocks figure includes rate of disturbance during seismic retrofit construction work on the Richmond-San Rafael Bridge, adjacent to the haul-out site. Average rates of disturbance after the end of construction (i.e., after 2005) are probably lower than those cited.

the San Juan Islands, Washington, recorded that 55% of kayakers (n=11) that came within 1 km of the haul-out site caused seals to flush, compared to 9% of motorized watercraft (n=436) (Suryan and Harvey 1999). In that study, most disturbances occurred when watercraft were within 300 m of a haul-out site. After detection by seals, motorized boats were able to approach the sites more closely than nonmotorized watercraft (Suryan and Harvey 1999). In Bolinas Lagoon, California, Allen et al. (1984) reported that most disturbances to seal haul-out sites were caused by nonmotorized boats, primarily canoes.

Paddle boats tend to travel closer to shore, potentially increasing the likelihood of disturbances (Suryan and Harvey 1999, Green et al. 2006). Harbor seal haul-out sites may in fact attract paddled boats, as boaters move closer to observe the seals. The behavior of paddled boats vs. motorboats is also a factor in seals' increased sensitivity; motorboats tend to maintain a constant heading and speed when moving past the haul-out site, whereas paddled boats often approach the site directly, changing speed and direction frequently (Kopec and Harvey 1995, Green et al. 2006). Furthermore, the ability to approach very quietly allows kayakers to get quite close to a haul-out site before detection, increasing the "surprise factor" and possibly eliciting a higher "startle response" in the seals (Borhorquez et al. 2000, Henry and Hammill 2001). Henry and Hammill (2001) suggest that the approach of paddled boats (slow, quiet and low to the water) may appear more like a predator than other types of watercraft.

A recently completed monitoring study of the three largest San Francisco Bay haul-out sites (Castro Rocks, Yerba Buena Island, and Mowry Slough) supports these findings; at two of the sites, kayaks within 200 m of the seals caused a higher proportion of flushes than other types of watercraft (Bohorquez et al. 2000), caused 15% and 20% of all watercraft-related disturbances, and usually approached closer to the haul-out sites (Green et al. 2006).

In addition to increased sensitivity to non-motorized watercraft, seals may be less likely to re-haul after a flush by kayaks and canoes, as these paddled boats tend to stay in the area longer than motorized watercraft (Henry and Hammill 2001). Seals are more sensitive to disturbance during pupping and molting seasons (mid-March through July) (Green et al. 2006, Suryan and Harvey 1999), and boating activities near haul-out sites during those months could affect reproductive activities. Disturbance-related mortality to pups can result from the stampeding nature of flushes, and the separation of mother-pup pairs during the early bonding period that can occur during these events (Johnson 1977, Calambokidis et al. 1991). Even small increases in levels of disturbance near haul-out sites during the pupping season could therefore result in reductions in pup survival at San Francisco Bay haul-out sites.

These studies and others have concluded that human activity can cause seals to flush off of haul-out sites, and that after a flush, numbers of seals on the haul-out site often do not recover fully (i.e., some seals did not return to the haul-out site immediately following the disturbance) (Allen et al. 1984, Calambokidis et al. 1991, Suryan and Harvey 1999). Thus, disturbance by humans, both inadvertent and deliberate, can cause declines in numbers of seals using terrestrial haul-out sites (Orr 1965, Terhune and Almon 1983, Allen et al. 1984, Hanan 1996). If sufficiently disruptive, disturbance may cause seals to abandon traditional haul-out sites (Newby 1973, Paulbitski 1975, Allen 1991). Following a flush, seals may remain in the water near the haul-out site, or move to another nearby haul-out site. In populated areas where haul-out space is limited,

such as San Francisco Bay, disturbance to existing haul-out sites can reduce the number of suitable haul-out sites in an area to a few, relatively remote sites (Terhune and Almon 1983), and may therefore have a considerable negative impact on seal populations in the area (Allen et al. 1984, Suryan and Harvey 1999, Lelli and Harris 1991). Harbor seals in San Francisco Bay generally forage within 3.2 miles of haul-out sites (Nickel 2003, Grigg 2008), and rely on these sites for resting between foraging trips. Studies on captive animals suggest that seals need haul-out time year round (Brasseur et. al., 1996).

The distance at which watercraft will cause seals to flush off of a site varies with a number of factors, including location, type of watercraft and watercraft behavior, number of seals on the site, and sensitivity of seals using the site. Most researchers studying disturbance to seals attempt to assess effects of any potential disturbance within 1 km of the site, but recommended distances for buffer zones (based on distances at which watercraft caused seals to flush) are generally in the 100 m range: at minimum, 91 m from the haul-out site, and preferably at least 150 m from the site when feasible (Allen et al. 1984, Calambokidis et al. 1991, Green et al. 2006, Johnson and Acevedo-Gutierrez 2007). A “boat exclusion zone” was set up at the Castro Rocks haul-out site during the seismic retrofit work on the adjacent Richmond-San Rafael Bridge, and appeared to be effective at minimizing disturbance to seals at this site (Green et al. 2006). The buoys marking the “boat exclusion zone” at Castro Rocks were located 91 m from the site on all sides except the eastern edge, where the nature of the site and adjacent bridge work necessitated a smaller distance (31 m).

OTHER MARSH SPECIES

As discussed in Section 3.7, WT-related activities could potentially impact existing wetlands. Disturbance of these habitats could affect the species resident in the wetlands. Three sensitive species of terrestrial mammals may be present in tidal salt marshes around the Bay: salt marsh harvest mouse, salt marsh wandering shrew, and Suisun ornate shrew. In addition, Northwestern pond turtles may be present in fresh to brackish marshes in parts of the project area, and vernal pool tadpole shrimp have the potential to occur in the project area. These marsh species are described below.

Salt Marsh Harvest Mouse

The salt marsh harvest mouse (*Reithrodontomys raviventris*) is endemic to the Bay Area, where its two subspecies inhabit the southern and northern reaches of the San Francisco Estuary (*R. r. raviventris* – San Francisco Bay; *R. r. halicoetes* – San Pablo Bay and Suisun Marsh, Contra Costa shoreline marshes; Shellhammer 2000a). It is federally- and state-listed as endangered.

The salt marsh harvest mouse is narrowly adapted to salt-influenced emergent marsh vegetation that is infrequently flooded. It has high affinity for pickleweed and associated vegetation, but it also occurs in adjacent grasslands, particularly in spring. Survival of its populations often depends on adequate cover (dense, tall vegetation or debris along terrestrial edges or levees of salt marshes, or along high tidal creek banks) when primary marsh habitats are flooded by extreme high tides. The salt marsh harvest mouse is also found in diked salt or brackish marshes, where it is often more abundant than in adjacent tidal marshes.

The distribution or abundance of the salt marsh harvest mouse in any particular marsh location is subject to annual and seasonal variation. It is likely that suitable habitats or populations of the

salt marsh harvest mouse would occur near some potential WT trailheads, and NMSBs may make intentional or emergency landings in or near salt marsh harvest mouse habitat.

Salt Marsh Wandering Shrew

The salt marsh wandering shrew (*Sorex vagrans halicoetes*) is a species of concern to federal and state resource agencies, but has no special legal protective status. Very little is known about its contemporary distribution or abundance in its geographic range in San Francisco Bay, but in the mid-20th century, shrews may have represented about 10% of small mammals occupying San Francisco Bay tidal marshes (Shellhammer 2000b). The salt marsh wandering shrew inhabits moist high or middle marsh plains with ample invertebrate prey, and ample cover provided by driftwood, litter, and debris. It is also probably dependent on flood refuge cover near or within marsh habitats it occupies, like the salt marsh harvest mouse. It is likely that suitable habitats or populations of the salt marsh wandering shrew would occur near some potential WT trailheads, and NMSBs may make planned or emergency landings in or near suitable habitat for this species.

Suisun Ornate Shrew

Like the salt marsh wandering shrew, the Suisun ornate shrew (*Sorex ornatus sinuosus*) is also a species of concern to federal and state resource agencies, and also has no special legal protective status. The Suisun shrew probably occurs in scattered populations in tidal brackish or salt marshes between the Petaluma River mouth and eastern Montezuma Slough, where it was formerly documented. Recent populations have been confirmed at few locations (MacKay 2000). Its habitat requirements appear to be similar to those of the salt marsh wandering shrew. It is likely that some, but relatively few, suitable habitats or populations of the Suisun shrew would occur near potential WT trailheads, and NMSBs may make intentional or emergency landings in or near habitat suitable for the Suisun ornate shrew.

Vernal pool tadpole shrimp

The vernal pool tadpole shrimp (*Lepidurus packardii*) is a federally listed endangered species that inhabits vernal pools and similar isolated seasonal pools that support prolonged, submerged, bare, muddy substrate during winter rainfall months. It occurs in seasonal wetlands near the Bay near Warm Springs, Fremont. While it has not been documented in the immediate vicinity of the Bay, it has the potential to occur in the project area. It is possible that NMSB users could make landings in or near habitat occupied by or suitable for this species. Potential impacts to the habitat of the vernal pool tadpole shrimp are addressed in Section 3.7.

Northwestern pond turtle

Northwestern pond turtles (*Clemmys marmorata marmorata*) are a species of concern for state and federal resource agencies because of widespread population declines and habitat losses, but they are not listed as threatened or endangered, and lack special legal protective status. They inhabit freshwater to fresh-brackish marshes, ponds, and tidal sloughs in the San Francisco Estuary and adjacent wetlands. Northwestern pond turtles occur rarely in the South Bay but at least one population is known from a portion of South Bay Salt Ponds pond A3W (EDAW et al. 2007), but none has been reported from brackish tidal sloughs (although these are considered potentially suitable habitat).

Northwestern pond turtles are widespread in the fresh to brackish tidal sloughs and non-tidal ponds (areas with seasonally and annually variable salinity) in Suisun Marsh. They may potentially occur in the fresher reaches of the Napa-Sonoma Marshes, but no information is

available on their distribution there. In Suisun Marsh, northwestern pond turtles bask on cohesive peat or mud banks of tidal creeks and sloughs, and large debris along banks, such as driftwood. It is possible that some populations or suitable habitats of the western pond turtle could occur near potential WT trailheads in Suisun Marsh or the northern Contra Costa shoreline, and that NMSB users could make landings in or near habitat occupied by or suitable for this species.

3.9.3 LOCAL SETTING

The proximity of the 112 Backbone Sites to haul-out sites, and marsh habitat and associated sensitive species varies. The distribution of sensitive habitats around the Bay is shown in Figures 3.7.2-1 and 3.9.2-1. Certain areas have also been specifically identified as sensitive in various planning documents, as described below. A Recovery Plan for the California clapper rail and salt marsh harvest mouse was released by USFWS in 1984. The 1984 plan still applies in principle, but it is outdated in terms of specific geographic areas targeted for conservation. It is being replaced with the Tidal Marsh Recovery Plan, which was issued in draft form on February 10, 2010 (USFWS 2010). The 1984 plan was based on trapping studies, some of which were completed in the 1970s. When issuing permits, USFWS no longer relies on trapping studies to determine whether salt marsh harvest mice may be present. It makes a call on “likely occupied” based on recent habitat suitability conditions and distribution of known past recurrent population localities.

3.9.4 REGULATORY SETTING

FEDERAL REGULATIONS AND PLANS

Federal regulations described in Section 3.7 -- Sections 7, 9, and 10 of the Endangered Species Act, Section 404 of the Clean Water Act, and Executive Order 11990 -- also apply to the protection of harbor seals and other marsh species. In addition, like other marine mammals in the U.S., harbor seals are protected under the Marine Mammal Protection Act (MMPA).

MARINE MAMMAL PROTECTION ACT (MMPA)

The MMPA prohibits the take of marine mammals in U.S. waters and the importation of marine mammals and marine mammal products into the U.S. The term “take” is defined as harassing, hunting, capturing, killing, or attempting to harass, hunt, capture, or kill any marine mammal. “Harassment” is defined as any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal in the wild; or the potential to disturb a marine mammal in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering. The NOAA Fisheries Service administers the MMPA in San Francisco Bay. The NOAA Fisheries Service policy on human interactions with wild marine mammals notes that

“the MMPA does not provide for a permit or other authorization to view or interact with wild marine mammals, except for specific purposes such as scientific research. Therefore, interacting with wild marine mammals should not be attempted and viewing marine mammals must be conducted in a manner that does not harass the animals. NOAA Fisheries does not support, condone, approve, or authorize activities that involve closely approaching, interacting, or attempting to interact with whales, dolphins, porpoises, seals, or sea lions in the wild. This includes attempting to swim with, pet, touch, or elicit a reaction from the animals.” (NMFS 2008)

In the context of the WT, “harassment” would be any action by a NMSB user that causes a change in the behavior of harbor seals on the haul-out site (e.g., causing seals to “flush” off the haul-out site into the water).

MAGNUSSON-STEVENS FISHERIES CONSERVATION ACT OF 2007

The Magnusson-Stevens Fisheries Conservation Act (MSRA), a national program administered by NOAA for the conservation and management of the fishery resources of the United States, is necessary to prevent overfishing, to rebuild overfished stocks, to ensure conservation, to facilitate long-term protection of Essential Fish Habitat (EFH), and to realize the full potential of the nation's fishery resources. Under this Act, EFH has been identified to protect specific species of fish primarily from over fishing but also from non-fishing related activities such as dredging, filling, excavation, actions that contribute to non-point source pollution and sedimentation, introduction of potentially hazardous materials, introduction of exotic species, and the conversion of aquatic habitat that may eliminate, diminish, or disrupt the functions of the EFH. This is achieved by Fish Management Plans (FMP) and designating EFH. EFH can include open waters, wetlands and eelgrass. Activities within EFH require consultation with NOAA.

EFH is determined by the habitat that a specific fish uses. All of San Francisco Bay is considered EFH for some species, and all wetlands along the Bay shore are also considered EFH. For Coho and chinook salmon and steelhead, EFH includes San Francisco Bay and any wetland areas within the Bay (NMFS 2009a). The EFH for groundfish is the San Francisco Bay estuary, including wetlands and eelgrass areas (NMFS 2009a). The EFH for pelagic fish (e.g., certain life stages of the northern anchovy and Pacific sardine among others) is also San Francisco Bay (NMFS 2009b).

COMPREHENSIVE CONSERVATION PLANS

A Comprehensive Conservation Plan (CCP) is being prepared for the San Pablo Bay NWR and is expected to be finished in 2010. A CCP for Don Edwards NWR is expected to be finished in 2012. Several haul-out sites for harbor seals are located in these NWRs.

STATE REGULATIONS

The California Endangered Species Act, described in Section 3.7, also applies to other types of wildlife, including certain marsh wildlife species. In addition, as discussed in Section 3.8, certain provisions of the California Fish and Game Code, Section 1600 et seq. (Streambed Alteration Agreements) also apply to wildlife. Finally, Executive Order W-59-93, the California Wetlands

Conservation Policy described in Section 3.7 applies to wetlands, and would protect the habitat of marsh-dependent species. Harbor seals are not listed as endangered, threatened or of special concern by the California Department of Fish and Game.

PORTER-COLOGNE WATER QUALITY CONTROL ACT

Under the Porter-Cologne Water Quality Control Act, biological “beneficial uses” of state waters are subject to regulation through various means, including mandatory conditions attached to state water quality certification of Clean Water Act (Sections 401, 404) authorizations. Water and sediment quality are important factors in the health of marine mammals; these two factors are also regulated under the Porter-Cologne Water Quality Control Act. Finally, certain provisions of the Porter-Cologne Water Quality Control Act apply to wetlands, and would protect the habitat of marsh-dependent species. The Regional Water Quality Control Boards frequently provide Porter Cologne compliance with wetland beneficial use policies by attaching mandatory conditions to Section 401 certification for Corps permits for fill discharges in federal jurisdictional wetlands.

CALIFORNIA MARINE LIFE PROTECTION ACT OF 1999

The goal of the MLPA is to develop a cohesive network of protected marine areas to benefit marine dependent wildlife (refer to section 3.2 for further information). The MLPA has six goals for enhancing and developing the MPAs:

1. Protect the natural diversity and abundance of marine life, and the structure, function and integrity of marine ecosystems.
2. Help sustain, conserve and protect marine life populations, including those of economic value, and rebuild those that are depleted.
3. Improve recreational, educational and study opportunities provided by marine ecosystems that are subject to minimal human disturbance, and manage these uses in a manner consistent with protecting biodiversity.
4. Protect marine natural heritage, including protection of representative and unique marine life habitats in CA waters for their intrinsic values.
5. Ensure California's MPAs have clearly defined objectives, effective management measures and adequate enforcement and are based on sound scientific guidelines.
6. Ensure the State's MPAs are designed and managed, to the extent possible, as a network (CDFG 2009b).

LOCAL AND REGIONAL REGULATIONS

The provisions of the McAtter-Petris Act described in Section 3.7 would also apply to marsh-dependent wildlife species. The Bay Plan has policies to preserve and protect fish, other aquatic organisms, and wildlife for future generations. It states that tidal wetlands and subtidal habitat should be conserved, restored, and increased. Specific habitat that would protect or restore native and special status species is to be protected whether in the Bay or behind dikes.

3.9.5 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The significance of potential biological impacts to harbor seals and marsh-dependent wildlife is determined by regulatory requirements and by the scientific literature on ecology, conservation

biology, and related environmental sciences. Potential impacts to habitats for these species were addressed in Section 3.7. Potential impacts were considered significant if they would:

- Have a substantial adverse effect, either directly or indirectly through habitat modifications, on any species identified as candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game, NOAA Fisheries, or U.S. Fish and Wildlife Service. A substantial adverse effect would occur if the project would:
 - Extirpate (cause local extinction of) a population
 - Cause or contribute to a substantial decrease in the distribution (range) or abundance of a sensitive or special status wildlife species, substantially diminish or degrade habitat of these species, reduce such a species' regeneration capacity in its existing or historic range, or otherwise reduce the viability of a sensitive or special-status wildlife species or community to the point at which a local population declines or becomes unstable
 - "Take" of one or more individuals of a threatened or endangered species
 - Disturb reproduction or foraging such that the project results in, or contributes to, a major, long-term reduction in diversity of native animal species due to a project-related substantial decrease in habitat use, optimal foraging, or reproductive success
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites
- Cause a major, long-term reduction in diversity of native species and communities

METHODOLOGY

In most cases, impacts to biological resources were evaluated based on a number of factors: potential proximity of a potential WT trailhead or WT users to a resource, the sensitivity of that resource to disturbance, and temporal/spatial patterns of both disturbance and resource sensitivity.

HARBOR SEALS

The harbor seal impact assessment focuses on possible effects to primary haul out sites. The level of consistent use of the secondary haul-out sites is not known, as these sites have not been consistently surveyed. Secondary haul-out sites are identified when a potential impact may necessitate the collection of additional data on that haul-out site (e.g., number of seals using the site, timing and seasonality of use). As noted above, a single disturbance to hauled-out harbor seals during pupping/nursing could have significant impacts to those seals, although repeated disturbance is generally considered more likely to have serious impacts than isolated incidents. Not enough is known about the effects of non-powered watercraft on foraging (i.e., in water) seals to make predictions about potential impacts of increased use of seal foraging areas by WT users. Marine mammals have been shown to avoid water areas of increased noise from ships, etc. (e.g., Richardson et al. 1995). Where data were limited or missing regarding the potential for seals to respond to disturbances, a conservative (greater) distance was chosen as a potential disturbance distance, and mitigation measures were based on this conservative distance.

OTHER MARSH SPECIES

Potential impacts to marsh-dependent sensitive species were evaluated by considering the potential for WT-related construction activities and increased NMSB use to lead to habitat impacts and/or incidental take.

REGIONAL IMPACTS AND MITIGATION MEASURES

Impacts to harbor seals and marsh-dependent wildlife could occur both at the site-specific and regional levels. Potential regional impacts are described first, followed by site-specific impacts.

IMPACT BIO-12: REGIONAL IMPACTS ON SPECIAL-STATUS SMALL MAMMALS OF BAYLAND MARSHES

Regional impacts to marsh-dependent wildlife could result from damage to wetland habitat (trampling, see impact Bio-3), disturbance, and/or incidental take of one or more salt marsh harvest mice. Absent prevention efforts, the likelihood of trampling impacts would theoretically increase with increases in NMSB use, but the relative amount of increase is unknown. Increased WT use and particularly use of multiple locations could facilitate the spread of invasive plant species in wetland environments as discussed for Impact Bio-1. The spread of invasive plants may degrade salt marsh and brackish marsh habitats occupied by the salt marsh harvest mouse, Suisun ornate shrew, or salt marsh wandering shrew.

Take of a salt marsh harvest mouse could occur if a NMSB user landed their craft in a wetland area (e.g., as a result of an emergency, due to poor trailhead planning, or to sight-see). The boater(s) could inadvertently step on a nest and/or an individual mouse while landing or entering the habitat area. While the frequency of this type of entry into sensitive habitat by NMSB users is thought to be very small, it could increase with increased NMSB use due to implementation of the WT unless appropriate preventive measures are taken. WT Strategies 17, 18,19, 21 and 22 call for education of WT users through signage, brochures, the WT website, tour operators, boating clubs and other organizations, and use of trailhead stewards. Protection of environmental resources would be an integral part of the education and outreach efforts implemented as part of the WT. However, none of the strategies call for specific information pertaining to prevention of habitat damage resulting from trampling of wetland vegetation or spread of invasive species, or incidental take resulting from NMSB landings. Consequently, this impact is considered **potentially significant but mitigable**. With implementation of Mitigation Measure Bio-M12 and Mitigation Measures Bio-M2 and Bio-M3, both described in Section 3.7, this potential impact would be less than significant.

MITIGATION MEASURE BIO-M12: UNDERTAKE AVOIDANCE MEASURES

The best way to prevent potential impacts to marsh-dependent sensitive species is to ensure that NMSB users avoid areas that could potentially harbor these animals. The WT educational, outreach, and signage programs shall include general information on marsh-dependent sensitive species and their habitats, and shall encourage boaters to avoid entering the habitat. Educational materials shall include general information to help NMSB users recognize sensitive habitat, and, where applicable, include specific information about other nearby trailhead locations, to allow boaters to plan their routes and avoid landing in or entering sensitive habitat. To further discourage landings in sensitive habitat, educational materials shall also remind boaters about the possibility of becoming stuck at low tide if they pull out in the marsh.

Educational efforts will be phased, depending on the level of concern posed by a particular site. Signage and general educational materials would comprise the basic level of education. The educational materials provided by the WT will be available to all NMSB users, not just the small fraction of new users potentially attributable to implementation of the WT Plan. Education will therefore be an effective means of reducing the potential impacts to marsh-dependent sensitive species resulting from the implementation of the WT Plan.

At sites where there is a significant level of concern regarding potential NMSB user impacts to wetlands, as determined during the Trailhead Designation process or later, the WT shall work with the site owners/managers to encourage the implementation of docent programs at the trailhead to enhance the effectiveness of signage and related materials. The most extensive docent programs would include on-the-water docents to help direct boaters away from sensitive habitat and wildlife. Such on-the-water management of sensitive areas is the highest level of education and an effective means of preventing adverse human-wildlife interaction.

Mitigations Bio-M2 and Bio-M3, which would reduce trampling and help reduce the spread of invasive species, also will apply to this impact. Provided these mitigations are implemented, this impact would be less than significant.

IMPACT BIO-13: REGIONAL IMPACTS ON NORTHWEST POND TURTLES

In Suisun Marsh, boating at mid-to low tide along tidal sloughs may disturb Northwestern pond turtles, causing them to leave basking sites. If increased boating disturbances occur frequently enough, Northwest pond turtles may abandon scarce basking sites.

WT Strategies 17, 18,19, 21 and 22 call for education of WT users through signage, brochures, the WT website, tour operators, boating clubs and other organizations, and use of trailhead stewards. Protection of environmental resources would be an integral part of the education and outreach efforts implemented as part of the WT. However, none of the strategies call for specific information pertaining to boating in areas frequented by the Northwestern pond turtle. Consequently, this impact is considered **potentially significant but mitigable**. With implementation of Mitigation Measure Bio-M12, described above, this potential impact would be less than significant.

IMPACT BIO-14: DISTURBANCE TO HARBOR SEALS DUE TO INCREASED NMSB PRESENCE NEAR HAUL-OUT SITES

Most WT Backbone Sites would not be located near known or suspected harbor seal haul-out sites. Only two WT sites are located within 500 m of a known primary haul-out site: site M18 (Angel Island State Park: Ayala Cove) is located approximately 150 m from the Point Ione haul-out site, and site M8 (Clipper Yacht Harbor) is located approximately 280 m from the Sausalito Boatworks haul-out site (Figure 3.9.2-1). Both of these haul-out sites are located in populated areas currently exposed to high levels of use by watercraft, meaning that seals may already be habituated to relatively high levels of activity near the site. However, WT users could potentially travel near other, more distant and remote haul-out sites. Increases in NMSB activity due to the WT near known harbor seal haul-out sites could potentially impact populations of harbor seals by increasing their alertness/vigilance or causing them to move away from resting

spots towards or flush into the water. Increased levels of disturbance by NMSBs near haul-out sites could result in “take” due to disruption of normal behavioral and reproductive patterns.

In populated areas such as San Francisco Bay, disturbance caused by NMSBs could reduce the number of suitable haul-out sites in an area to a few, relatively remote sites (Terhune and Almon 1983), effectively reducing available terrestrial habitat for seals in the project area. A sudden decrease in use by seals (outside of normal seasonal patterns of site use) or the abandonment of any primary haul-out site (see Impact Bio-14, below) would represent a significant disruption of seal behavioral patterns. An increase in disturbance may be a particularly serious problem for pupping sites, which tend to be located in less disturbed areas; harbor seals may be slow to colonize new pupping sites (BCDC 2001). As described earlier, kayaks and canoes present a particular risk for disturbance to seals. The months of highest use by kayaks and canoes, May – October, overlap with the most sensitive seasons for San Francisco Bay seals: pupping (March – May) and molting (June-July).

The physical characteristics of some San Francisco Bay haul-out sites (gently sloping, unvegetated beaches, such as at Yerba Buena Island, or firm marsh peat shelves, such as at Mowry Slough) could actually attract boat landings by NMSBs. Human-powered watercraft, such as kayaks, have been seen landing on the Yerba Buena Island and Castro Rocks haul-out sites (E. Grigg, personal observation, 2008).

Haul-out sites within four miles of a WT site would be potentially reachable by kayakers,⁴² although tides, currents, winds, and individual abilities will together determine how far NMSB users actually travel on the Bay in any particular instance (see discussion of kayaking distance under Section 2.2.4). The potential Backbone Sites that are within four miles of the primary and secondary haul-out sites are listed in Table 3.9.5-1. Although using these potential WT sites does not mean that a NMSB will travel to one of the haul-out sites and try to land there, it does mean that the NMSB could travel within the disturbance zone (100-150 meters) of the haul-out sites, and in particular could do so at a time of year that would be particularly harmful to harbor seals, as discussed above. This impact is considered **potentially significant but mitigable**.

MITIGATION MEASURE BIO-M14: REVIEW IMPROVEMENTS AT CERTAIN SITES AND IMPLEMENT EDUCATION AND OUTREACH

Protecting haul-out sites is an essential part of protecting harbor seal populations. Implementation of the following mitigation measures would reduce project-related disturbance to a less than significant level.

Mitigation Measure Bio-M14A: Educate NMSB Users in Vicinity of Pupping Sites

As part of the trailhead designation process and preparation of Trailhead Plans, WT sites that are within four miles of a harbor seal pupping site (see Table 3.9.5-2) shall be reviewed for their potential to increase NMSB use as a result of designation and/or any improvements that are being considered. If such a potential is found to exist and the CEQA review determines that the potential increased use could adversely affect the pupping site, the Trailhead Plan shall include

⁴² This estimate is based on an informal survey of local individuals knowledgeable about kayak use in San Francisco Bay and is consistent with the kayaking range described in Section 5.1 of the WT Plan under “Launches.” See Section 2.2.4 for a more detailed discussion.

TABLE 3.9.5-1. PROPOSED WT BACKBONE SITES LOCATED WITHIN 4 MILES OF KNOWN HARBOR SEAL HAUL-OUT SITES¹

Site Map Key ⁴³	Water Trail Site Name	HOS?	Primary Haul-Out Sites within 4 miles ²	Secondary Haul-Out Sites within 4 miles ²
A1	Albany Beach	No	BI	
A2	Berkeley Marina, Ramp	Yes	BI	TR
A4	Point Emery	No		TR
A5	Shorebird Park	No		TR
A6	Emeryville City Marina	Yes	YBI	TR
A8	Middle Harbor Park	Yes	YBI	AB, TR
A9	Jack London Square/CCK	Yes		AB
A11	Estuary Park/ Jack London Aquatic Center	Yes		AB
A12	Grand Avenue Boat Ramp	Yes		AB
A14	Robert Crown Memorial State Beach	Yes		AB
A15	Encinal Launching and Fishing Facility	Yes		AB
A24	Jarvis Landing	No	NS, MS	
A26	Berkeley Marina, Small Boat Launch	Yes	BI	TR
A27	Coyote Hills	No		UC
CC8	Point Molate Beach Park	No	CR	RR
CC9	Keller Beach	Yes	CR, BI, BP	RR
CC10	Ferry Point	Yes	BI, CR, BP, PI	RR
CC11	Boat Ramp Street Launch Area	No	CR, BI	RR
CC14	Richmond Municipal Marina	Yes	BI, CR	
CC15	Marina Bay Park/Rosie the Riveter	No	BI, CR	
CC16	Shimada Friendship Park	Yes	BI	
CC17	Barbara & Jay Vincent Park	Yes	BI, CR	
CC19	Point Isabel Regional Shoreline	Yes	BI	
CC20	SS Red Oak Victory	No	BI, CR	
M1	Kirby Cove	Yes	PBO, SB	PP, AL
M2	Horseshoe Cove	Yes	SB, PI, PBO, PBL, BP	PP, AL
M3	Swede's Beach	No	SB, PI, BP, PBL, PBO	PP, AL
M4	Turney Street Public Boat Ramp	No	SB, PI, BP, PBL, PBO	PP
M5	Dunphy Park	Yes	SB, PI, BP, PBO, PBL	PP
M6	Schoonmaker Point	Yes	SB, PI, BP, PBO, PBL	PP
M8	Clipper Yacht Harbor	No	SB, PI, BP, PBO	PP
M10	Shelter Point Business Park	Yes	SB, CM	PP

⁴³ Site locations are shown on Figure 3.9.2-1

TABLE 3.9.5-1. PROPOSED WT BACKBONE SITES LOCATED WITHIN 4 MILES OF KNOWN HARBOR SEAL HAUL-OUT SITES¹

Site Map Key ⁴³	Water Trail Site Name	HOS?	Primary Haul-Out Sites within 4 miles ²	Secondary Haul-Out Sites within 4 miles ²
M11	Bayfront Park	Yes	SB, CM	
M13	Brickyard Park	No	SB, CM, BP, PI	PP
M16	Richardson Bay Park/Blackies Pasture	No	SB, CM, BP, PI	PP, RR
M17	Angel Island State Park (Kayak Camp)	Yes	PI, BP, PBL, SB	PP, AL
M18	Angel Island State Park (Ayala Cove)	Yes	PI, BP, PBL, SB	PP, AL
M19	Sam's Anchor Cafe,	No	PI, BP, SB, PBL	PP, AL, RR
M25	Higgins Dock	No	CM	
M27	Bon Aire Landing	No	CM	
M28	Marin Rowing Association Boathouse	No	CM	
M29	Ramillard Park	No	CM	
M30	San Quentin	No	CM, CR	RR
M31	Jean & John Starkweather Shoreline Park	No	CM, CR	RR
M33	Harbor 15 Restaurant	No	CM	
M35	Loch Lomond Marina: Ramp	Yes	CM	
M36	Loch Lomond Marina: Beach	Yes	CM	
SC2	Alviso Marina	No	GS, CC	DR
SC3	Palo Alto Baylands Launching Dock	Yes	NS	CP
SF2	India Basin Shoreline Park	Yes		AB
SF6	The Ramp	No	YBI	AB
SF7	Pier 52 Boat Launch	Yes	YBI	AB, TR
SF8	South Beach Harbor (AKA Pier 40)	No	YBI	TR, AL, AB
SF9	Treasure Island	No	YBI, PBL	TR, AL
SF10	Aquatic Park	Yes	PBL, YBI	AL, TR
SF11	Gas House Cove (aka Marina Green)	No	PBL, YBI	AL, TR, PP
SF12	Crissy Field	Yes	PBL	AL, PP
SF13	Brannan St Wharf	No	YBI	TR, AL
SF14	Northeast Wharf Park	No	YBI, PBL	AL, TR
SM2	Ravenswood Open Space Preserve	No	NS, GI	
SM4	Redwood City Municipal Marina	Yes	CS, GI, BA	BS
SM6	Docktown Marina	No	CS, GI, BA	BS
SM9	Redwood Shores Lagoon	No	CS, BA, GI	BS
SM11	Beaches on the Bay	No	BA, CS	BS, CO
SM12	Foster City Lagoon Boat Park	No	BA, CS	BS, CO

TABLE 3.9.5-1. PROPOSED WT BACKBONE SITES LOCATED WITHIN 4 MILES OF KNOWN HARBOR SEAL HAUL-OUT SITES¹

Site Map Key ⁴³	Water Trail Site Name	HOS?	Primary Haul-Out Sites within 4 miles ²	Secondary Haul-Out Sites within 4 miles ²
SM13	East 3rd Ave	Yes		CO, BS
SM16	Seal Point Park	Yes		CO, BS
SM17	Coyote Point, Marina	Yes		CO
SM18	Old Bayshore Highway	No		CO
SM23	Coyote Point, Beach	Yes		CO
SM24	Westpoint Marina	No	GI, CS, BA	BS
SM25	Corkscrew Slough Viewing Platform	No	CS, BA, GI	BS

¹Cells in the table left blank indicate that no primary (or secondary, depending on column) haul-out site is located within 4 miles of that particular WT site.

²Haul-out sites are listed in order of increasing distance from the Bay Water Trail site; abbreviations are as follows:
 Alameda Breakwater (AB), Alcatraz (AL), Bair Island (BA), Belmont Slough (BS), Bluff Point (BP), Brook’s Island (BI), Calaveras Point (CP), Castro Rocks (CR), Corkscrew Slough (CS), Corte Madera (CM), Coyote Creek (CC), Coyote Point (CO), Drawbridge (DR), Greco Island (GI), Guadalupe Slough (GS), Mowry Slough (MS), Newark Slough (NS), Peninsula Point (PP), Point Blunt (PBL), Point Ione (PI), Red Rock (RR), Ryer Island (RI), Sausalito Boatworks (SB), , Treasure Island (TR), Tubbs Island (TI), Union City Shoreline (UC), Yerba Buena Island (YBI)

TABLE 3.9.5-2. PROPOSED WT BACKBONE SITES LOCATED WITHIN 4 MILES OF KNOWN HARBOR SEAL PUPPING SITES¹

Site ID	Water Trail Site Name	HOS?	Pupping sites within 4 miles ¹
A24	Jarvis Landing	No	NS, MS
CC8	Point Molate Beach Park	No	CR
CC9	Keller Beach	Yes	CR,
CC10	Ferry Point	Yes	CR,
CC11	Boat Ramp Street Launch Area	No	CR
CC14	Richmond Municipal Marina	Yes	CR
CC15	Marina Bay Park/Rosie the Riveter	No	CR
CC17	Barbara & Jay Vincent Park	Yes	CR
CC20	SS Red Oak Victory	No	CR
M10	Shelter Point Business Park	Yes	CM
M11	Bayfront Park	Yes	CM
M13	Brickyard Park	No	CM
M16	Richardson Bay Park/Blackies Pasture	No	CM
M25	Higgins Dock	No	CM
M27	Bon Aire Landing	No	CM
M28	Marin Rowing Association Boathouse	No	CM
M29	Ramillard Park	No	CM
M30	San Quentin	No	CM, CR
M31	Jean & John Starkweather Shoreline Park	No	CM, CR
M33	Harbor 15 Restaurant	No	CM
M35	Loch Lomond Marina: Ramp	Yes	CM
M36	Loch Lomond Marina: Beach	Yes	CM
SC3	Palo Alto Baylands Launching Dock	Yes	NS
SM2	Ravenswood Open Space Preserve	No	NS, GI
SM4	Redwood City Municipal Marina	Yes	CS, GI, BA
SM6	Docktown Marina	No	CS, GI, BA
SM9	Redwood Shores Lagoon	No	CS, BA, GI
SM11	Beaches on the Bay	No	BA, CS
SM12	Foster City Lagoon Boat Park	No	BA, CS
SM24	Westpoint Marina	No	GI, CS, BA
SM25	Corkscrew Slough Viewing Platform	No	CS, BA, GI
¹ Haul-out sites are listed in order of increasing distance from the Water Trail site; abbreviations are as follows: Bair Island (BA), Castro Rocks (CR), Corkscrew Slough (CS), Corte Madera (CM), Greco Island (GI), Mowry Slough (MS), Newark Slough (NS),			

provisions for educating NMSB users regarding appropriate buffer distances for pupping sites, and the Trailhead Plan may be revised to modify or eliminate proposed site improvements.

Mitigation Measure Bio-M14B: Buffer Zone Signage and Other Markers

The following measures apply to all proposed WT site Trailhead and Signage Plans of sites within four miles of a primary or secondary seal haul-out site:

- Signage shall be used to notify boaters not to land their watercraft on seal haul-out sites. Signage shall also educate users about appropriate buffer zones. Although the practical size of a buffer zone will vary based on the nature of the haul-out site and navigational hazards in the area, buffer zones shall aim to keep boaters at least 100 meters from the haul-out site, and at least 150 meters from the site when feasible from March through July (during pupping and molting seasons). Whenever feasible, watercraft buffers should be marked by buoys placed near the haul-out site, as was done at the Castro Rocks haul-out site during construction near that site (see Green et al. 2006), and in Elkhorn Slough, California. Buoys should be clearly marked to indicate their purpose to WT users.

- Information on ways for WT users to view seals without causing disturbance shall be included in WT promotional materials, signage, training, on the website, and onsite educational and interpretive panels. . Such information is available through a number of organizations, including the NOAA Fisheries Office of Protected Resources (online at <http://www.nmfs.noaa.gov/pr/education/viewing.htm>). Information to be provided shall include:
 - Maintaining a minimum distance (approximately 100 meters) from the haul-out site at all times and at least 150 meters from March through July.
 - Maintaining a constant heading and speed while passing a haul-out site; avoiding stopping or sudden changes in heading or speed; avoiding paddling directly at resting seals
 - If seals show signs of disturbance (e.g., all seals on the haul-out are watching the NMSB, or seals begin to approach the water), the NMSB shall move further away from the haul-out site
 - Additional information on the importance of responsible wildlife viewing practices shall be included in WT promotional materials and signage.
 - Educational materials, outreach and signage shall include information on what boaters shall do in the event that they see an injured, sick, or dead seal, or an (apparently) abandoned seal pup (e.g., recommendations to not approach wildlife, contact information for the local marine mammal stranding and rehabilitation organization⁴⁴). The recommendations for what to do in these circumstances shall be consistent with those available from The Marine Mammal Center⁴⁵.

⁴⁴ For the San Francisco Bay area, this is The Marine Mammal Center, Sausalito, 415.289.SEAL (7325).

⁴⁵ Available online at http://www.marinemammalcenter.org/what_we_do/rescue/whattodo.asp

IMPACT BIO-15: AVOIDANCE OR ABANDONMENT OF TRADITIONAL HARBOR SEAL HAUL-OUT SITES DUE TO INCREASED NMSB USE

Regional development and increased use of the various WT sites could result in potentially significant adverse impacts to harbor seals, due to increased bay-wide presence of NMSBs, or presence of such watercraft in “new” areas promoted by the WT. Repeated disturbance from locally increased use could cause stress and health impacts to harbor seals unable to rest and eventually could cause seals to abandon haul-out sites altogether (Calambokidis et al. 1991, Newby 1973, Paulbitski 1975, Allen 1991). Long-term impacts to harbor seals, including decreased numbers of seals using traditional sites, or abandonment of these sites, are generally monitored using site surveys, as described above, and/or aerial surveys of haul-out sites such as those conducted by the CDFG and NOAA Fisheries (e.g., Grigg et al. 2004, Green et al. 2006).

A number of haul-out sites in the South San Francisco Bay are located on Don Edwards San Francisco Bay NWR land. Access to these sites is therefore covered by NWR regulations. Mowry Slough, the largest pupping site in San Francisco Bay, is located within the Don Edwards San Francisco Bay NWR, and access to Mowry Slough is closed to boats during the pupping season (March 15th to June 15th). A similar seasonal closure is being considered for Corkscrew Slough. The Yerba Buena Island haul-out site is located on USCG land, and boats are not permitted to land on this site, although the topography of the site makes this difficult for USCG personnel to monitor.

Based on the levels of WT use described in Chapter 2, increases in disturbances to haul-out sites due to implementation and promotion of the WT are unlikely to be dramatic. However, any increase in levels of disturbance to haul-out sites by NMSBs, particularly during sensitive seasons such as pupping, has the potential to result in a reduction in numbers of seals using that site. In populated areas such as San Francisco Bay, where availability of alternate haul-out sites is limited, this could reduce available suitable terrestrial habitat for seals.

Several WT sites are located within kayaking distance of pupping sites. Movement between Point Molate Beach Park (CC8), Keller Beach (CC9), and Ferry Point (CC10), or between CC8 and the Richmond Marina sites (CC14-17, and CC20) could increase disturbance to the Castro Rocks haul-out and pupping site during the pupping and molting seasons. Westpoint Marina (SM24) and Corkscrew Slough (SM25) are located in kayaking distance of harbor seal haul-out and pupping sites on Corkscrew Slough, Bair Island and Greco Island, and increased NMSB use originating from Westpoint Marina and Corkscrew Slough could increase disturbance to these haul-out sites during the pupping and molting seasons. Jarvis Landing (A24) and Alviso Marina (SC2) are in kayaking distance of the haul-out and pupping sites Mowry Slough and Newark Slough, and increased NMSB use originating from Jarvis Landing and Alviso Marina could increase disturbance to these haul-out sites during the pupping and molting seasons.

This impact is considered **potentially significant but mitigable**.

MITIGATION MEASURE BIO-M15: SEASONAL CLOSURES, MONITORING AND ADAPTIVE MANAGEMENT

The WT will work with USFWS and CDFG and NOAA to evaluate which WT sites present a potential concern for impacts to pupping or molting seals. These agencies would determine whether any WT site would require a seasonal closure. WT sites closest to harbor seal pupping sites (i.e., sites from which users would be most likely to come in proximity to a pupping site) may be closed during the pupping and molting season, in accordance with WT Plan Strategy 24 (Limitations on Trail Head Use), if DFG or USFWS make the determination that it is appropriate to do so, and the site owner/manager agrees to the closure. The WT sites near the largest pupping sites, Mowry Slough and Castro Rocks, are of particular concern. Mowry Slough is already seasonally closed by the USFWS from March 15 through June 15.

The need for seasonal restrictions on use of waters near harbor seal haul-out sites during sensitive seasons (primarily pupping, but also molting due to high numbers of seals present during this season) will also be determined by DFG, NOAA and USFWS. Any such recommended seasonal closures will be publicized via WT literature, web site, paddling groups, etc.

Information provided by resource agencies about the numbers of seals using haul-out sites in the project area (i.e., in the vicinity of trailheads) shall be assessed by WT staff on a yearly basis, to ensure that seal use of these sites is not declining. This is particularly important for the listed primary haul-out sites (Table 3.9.2-1). This monitoring is consistent with WT Plan Strategy 16 (Monitoring Impacts). Survey data may be obtained from ongoing monitoring projects, such as the monthly seal surveys conducted by the Don Edwards San Francisco Bay NWR, which encompasses Mowry and Newark Sloughs, the regional surveys coordinated by the National Park Service, or from agencies that monitor seal numbers at various haul-out sites (NOAA, DFG). Maximum counts collected during these surveys shall be compared to available counts data for these sites for previous years (e.g., Kopec and Harvey 1995, Green et al. 2006). In the absence of available baseline ground counts data for a given haul-out site, yearly aerial survey data collected by the CDFG and NOAA Fisheries shall be examined for evidence of declining numbers. In the event that numbers at a given haul-out or pupping site are found to be declining, the WT shall consult with the resource agencies and implement the agencies' recommendations in any future Trailhead Plans or revised Trailhead Plans for sites that may be contributing to this decline.

SITE-SPECIFIC IMPACTS AND MITIGATION MEASURES

IMPACT BIO-16: CONSTRUCTION AND TRAILHEAD IMPACTS ON SPECIAL-STATUS ANIMALS OF BAYLAND MARSHES

At sites where WT implementation may lead to increased use and/or construction of new facilities, both direct and indirect impacts to marsh-dependent special status species could occur. Direct impacts could occur from "take" of a salt marsh harvest mouse if one or more individuals are injured or killed as a result of construction or recreational activities at a WT trailhead. Increased use and construction could also lead to trampling of sensitive wetland vegetation at the trailhead (Impact Bio-3). This could displace salt marsh harvest mice and other sensitive marsh species from existing habitat, and therefore lead to loss of individuals or population declines. Northwestern pond turtle basking sites in Suisun Marsh could be subject to increased disturbance if WT outreach or WT-funded construction of new facilities leads to increased NMSB presence

in sloughs where turtle basking sites are present, or if WT-related construction creates a direct disturbance to basking sites.

In addition, food waste associated with increased WT-related use of trailheads could attract and/or increase local populations of non-native terrestrial predators such as feral cats, red fox, or Norway rats. At trailheads in the vicinity of marsh habitats occupied by special-status small mammals, these predators may contribute to population declines of special-status small mammals. This impact is **potentially significant but mitigable**.

MITIGATION MEASURE BIO-M16: UNDERTAKE WASTE MANAGEMENT, PREDATOR CONTROL, AND BASKING IMPACT MINIMIZATION

The trailhead designation process shall include evaluation of the potential for special status animal species to occur on or near the site. If special status animal species potentially occur at or adjacent to proposed trailheads and the Trailhead Plan involves facility development or other WT activities that may substantially increase site use, the following mitigation measures shall be incorporated into the Trailhead Plan:

- Trailhead owners/managers shall provide adequate waste disposal containers, and shall ensure that waste disposal containers are inaccessible to non-native predators (Norway rats, feral cats, red fox) to the greatest extent feasible.
- State and federal wildlife agencies shall be consulted during the preparation of the Trailhead Plan to determine the need for predator control measures to control any potential increases in predator populations resulting from implementation of the WT. Trailhead sponsors shall implement non-native predator control if state or federal wildlife agencies conclude that it is warranted to protect special-status mammal populations in local marshes from potential increased predator presence attributable to implementation of the WT.
- For trailheads within Suisun Marsh, state and federal wildlife agencies will be consulted during the preparation of the Trailhead Plan to determine whether significant basking sites for Northwestern pond turtles occur along sloughs in the vicinity of trailheads. If significant basking sites are present where NMSB use may increase as a result of the WT, trailhead owners/managers shall consult with state and federal wildlife agencies to prepare and implement feasible plans to avoid or minimize boater disturbance of Northwestern pond turtle basking sites. Mitigation measures may include seasonal closures, signage to discourage boater approach of basking sites, or placement of alternative basking structures (large woody debris) in reaches of sloughs where CDFG surveys have shown that turtles are present, and that are subject to less frequent disturbance by boaters.
- Prior to any construction at a WT trailhead, sponsors shall evaluate the potential for sensitive habitat to occur at or in the immediate vicinity of the construction area, and shall avoid any construction measures in potentially sensitive habitat, if feasible. If avoidance of the habitat is infeasible, then the site sponsor shall coordinate with USFWS regarding data collection needs and implement buffers, best management practices, or avoidance measures as recommended by USFWS.

Mitigations Bio-M2 and Bio-M3 also would apply to this impact.

IMPACT BIO-17: DISTURBANCE TO HARBOR SEALS DUE TO CONSTRUCTION

Based on the range of distances at which construction-related disturbance sources caused seals to flush off a haul-out site as reported elsewhere (Green et al. 2006), short-term disturbances to seals due to construction of new facilities and improvements (including signage) at new or existing WT sites would most likely only impact seals on haul-out sites located within 500 m of a WT site. This distance is greater than the recommended buffer distance for watercraft, as construction work tends to be associated with sudden increases in novel disturbance sources, noise and vibration. As discussed earlier, only two WT sites are located within 500 m of a known primary haul-out site: site M17 (Angel Island State Park) is located approximately 150 m from the Point Ione haul-out site, and site M8 (Clipper Yacht Harbor) is located approximately 280 m from the Sausalito Boatworks haul-out site (Figure 3.9.2-1). Both of these haul-out sites are located in populated areas currently exposed to high levels of use by boaters, etc., meaning that seals may already be habituated to relatively high levels of activity near the site. In addition, WT site M17 is an HOS, meaning that construction work there would be minimal. The potential impact from site M8 and any future WT sites that may be located within 500 m of a haul-out is considered **potentially significant but mitigable**.

MITIGATION MEASURE BIO-M17: PROVIDE MITIGATION FOR DISTURBANCE TO HARBOR SEALS DUE TO CONSTRUCTION/IMPROVEMENTS AT WT SITES

The Trailhead Plan for any WT sites located within 500 m of a primary haul-out site shall require pre-construction ground-based haul-out site surveys. The surveys shall be conducted by qualified seal biologists, and shall encompass a complete tidal cycle (i.e., both the low and high tides) for 1-3 days prior to construction work to provide information on the tide and timing of site use by seals. In bays and estuaries such as the San Francisco Bay, tide height is a primary factor influencing number of seals ashore (Thompson et al. 1997). If feasible based on other constraints, construction and improvements to the affected WT site shall be conducted at a time/tide height when seals are not likely to be present on the site, thereby avoiding potential disturbance to resting seals. Alternately, again following Green et al. (2006), workers shall remain a minimum of 150 m from the seal haul-out site (the average distance at which a terrestrial construction activity caused seals to flush was 173 m). Visual barriers such as tarps shall be placed between the WT site and the seal haul-out site, if the work would be visible to seals on the haul-out site.

None of the proposed Backbone Sites are located within 500 meters of a pupping site. If in the future a new WT trailhead is proposed within 500 meters of a pupping site, in addition to the requirements outlined above, any construction at these future sites shall be conducted outside the pupping and molting seasons.

3.10 CULTURAL RESOURCES

This section identifies potential cultural resources impacts that could result from the proposed project. Cultural resources include historical and archaeological resources. This section is based on a cultural resources overview report prepared by Holman & Associates (2007).

3.10.1 INITIAL STUDY FINDINGS

The Initial Study found that potentially significant impacts to historical and archaeological resources, or buried human remains may occur from implementation of the Water Trail. The IS found that the project would not have the potential for significant impacts on paleontological resources.

3.10.2 REGIONAL SETTING

Archaeological research has documented continuous occupation and/or use of the Bay margin beginning as much as six thousand years ago, building in intensity over the past three thousand years, ending with the arrival of the Spanish in the late 18th century. The earliest occupation sites of the Native Americans, dating back as much as 9,000 years before the present, were clustered around the banks of the rivers which drained into what is now San Francisco Bay. Rising water levels have flooded these site locations under many feet of water. Several locations in the Bay counties have yielded archaeological materials dating back 6,000 years that are right at or above the current Bay shoreline.

The earliest occupation layers at these sites were created by Native Americans who had immigrated into the Bay Area from the Great Basin east of the Sierras. These people were big game hunters with little experience in collecting the principal food source (shellfish) found along the Bay margin. Within a very short time period these new arrivals learned when it was safe to eat shellfish, the remains of which began to appear in visible quantities at their villages and smaller procurement sites.

Over the past two to three thousand years, this enhanced food resource base and an increase in immigration from outside the Bay Area led to a huge population jump in the Bay counties along the Bay margin: villages comprised of cultural soils (midden) containing large amounts of shellfish were up to 40 feet high, covering several acres in locations in Alameda and Contra Costa Counties. Population concentrations grew so dense that Native American villages containing shellfish remains and other foods taken from the Bay margins were established at locations several miles from the actual food collection areas. The archaeological record suggests that population density was still on the rise at the time of the arrival of the Spanish in the late 18th century. By 1805, there were no Native peoples practicing their former food gathering activities anywhere near San Francisco Bay.

3.10.3 LOCAL SETTING

As described in Table 3.10.3-1, based on the literature review, 37 WT Backbone Sites were identified as potentially containing or overlapping with recorded archaeological sites and 75 others did not show any archaeological sites present. Of the 75 WT site locations for which the literature search showed no archaeological sites present, 32 had been subject to site-specific

TABLE 3.10.3-1. WT SITES AND ARCHAEOLOGICAL SITES

Site Map Key⁴⁶	USGS Quad	Overlap Known Archaeological Sites?	Site-Specific Surveys/ Evaluations Conducted?	Comments
A1	Richmond	Yes	No	Note 1
A2	Oakland West	No	No	
A4	Oakland West	No	Yes	
A5	Oakland West	Yes	Yes	
A6	Oakland West	No	No	
A8	Oakland West	No	Yes	
A9	Oakland West	No	Yes	
A11	Oakland West	No	Yes	
A12	Oakland West	No	No	Adjacent to border of Oakland East
A14	Oakland West	No	No	
A15	Oakland West	No	No	
A18	San Leandro	Yes	Yes	East side of channel has survey, no site
A20	San Leandro	No	Yes	
A22	Redwood Point	Yes	No	Note 1
A24	Newark	No	No	
A25	Oakland East	No	No	
A26	Oakland West	No	No	
A27	Redwood Point	No	No	
A28	San Leandro	No	Yes	N322 & N323 ½ mile to NE
A30	San Leandro	No	Yes	
CC1	Benicia	No	No	
CC2	Benicia	No	No	
CC5	Mare Island	Yes	No	Note 1

⁴⁶ See figures 2.1.4-1A and 2.1.4-1B

TABLE 3.10.3-1. WT SITES AND ARCHAEOLOGICAL SITES

Site Map Key ⁴⁶	USGS Quad	Overlap Known Archaeological Sites?	Site-Specific Surveys/ Evaluations Conducted?	Comments
CC6	Mare Island	No	No	
CC8	San Quentin	Yes	Yes	
CC9	San Quentin	No	No	
CC10	San Quentin	Yes	No	Note 1
CC11	Richmond	No	No	
CC14	Richmond	No	Yes	
CC15	Richmond	Yes	Yes	
CC16	Richmond	No	Yes	
CC17	Richmond	No	Yes	
CC19	Richmond	Yes	Yes	
CC20	Richmond	Yes	Yes	
CC21	Mare Island	No	Yes	
CC22	Honker Bay	No	Yes	
CC23	Mare Island	No	No	
M1	San Francisco North	No	No	
M2	San Francisco North	No	No	
M3	San Francisco North	Yes	No	Note 1
M4	San Francisco North	Yes	No	Note 1
M5	San Francisco North	No	No	
M6	San Francisco North	No	Yes	
M8	San Francisco North	Yes	No	Note 1
M10	San Rafael	No	No	
M11	San Rafael	No	No	
M13	San Rafael	No	No	Near edge for San Quentin
M16	San Quentin	Yes	Yes	

TABLE 3.10.3-1. WT SITES AND ARCHAEOLOGICAL SITES

Site Map Key ⁴⁶	USGS Quad	Overlap Known Archaeological Sites?	Site-Specific Surveys/ Evaluations Conducted?	Comments
M17	San Francisco North	Yes	Yes	
M19	San Francisco North	No	No	
M25	San Rafael	No	Yes	
M27	San Rafael	Yes	No	Note 1
M28	San Rafael	No	No	
M29	San Quentin	No	Yes	Adjacent to border of San Rafael
M30	San Quentin	No	Yes	
M31	San Quentin	No	Yes	
M33	San Rafael	No	Yes	
M35	San Quentin	Yes	Yes	
M36	San Quentin	Yes	Yes	
M38	San Quentin	Yes	Yes	
M39	Petaluma Point	Yes	Yes	
M40	Petaluma Point	Yes	Yes	
M41	Novato	No	Yes	
M43	Novato	Yes	Yes	
M47	Novato	Yes	No	Note 1
N1	Cuttings Wharf	No	Yes	
N2	Napa	Yes	Yes	Sites NSD-3, 4
N6	Cuttings Wharf	No	No	
N7	Cuttings Wharf	Yes	No	Note 1
N8	Napa	No	No	
SC2	Milpitas	Yes	Yes	
SC3	Mountain View	No	Yes	
SF1	San Francisco South	No	Yes	

TABLE 3.10.3-1. WT SITES AND ARCHAEOLOGICAL SITES

Site Map Key⁴⁶	USGS Quad	Overlap Known Archaeological Sites?	Site-Specific Surveys/ Evaluations Conducted?	Comments
SF2	Hunters Point	Yes	No	Note 1
SF4	San Francisco South	No	Yes	
SF6	San Francisco North	No	Yes	
SF7	San Francisco North	No	Yes	
SF8	San Francisco North	No	Yes	
SF9	Oakland West	Yes	Yes	
SF10	San Francisco North	Yes	Yes	
SF11	San Francisco North	Yes	Yes	
SF12	San Francisco North	Yes	Yes	
SF13	San Francisco North	No	Yes	
SF14	San Francisco North	No	No	
SM2	Palo Alto	No	No	Assumed to be Palo Alto based on landform Redwood Pt., Newark, Mountain View
SM4	Redwood Point	No	No	
SM6	Palo Alto	No	No	
SM9	San Mateo	No	Yes	
SM11	San Mateo	No	No	
SM12	San Mateo	No	No	
SM13	San Mateo	No	Yes	
SM16	San Mateo	No	No	
SM17	San Mateo	Yes	No	Note 1
SM18	San Mateo	Yes	Yes	
SM20	San Francisco South	No	No	
SM21	San Francisco South	No	No	
SM22	San Francisco South	No	No	
SM23	San Mateo	Yes	No	Note 1

TABLE 3.10.3-1. WT SITES AND ARCHAEOLOGICAL SITES

Site Map Key⁴⁶	USGS Quad	Overlap Known Archaeological Sites?	Site-Specific Surveys/ Evaluations Conducted?	Comments
SM24	Redwood Point	No	Yes	
SM25	Redwood Point	No	No	
SN3	Cuttings Wharf	No	No	Adjacent to border of Sears Point
SN5	Petaluma River	Yes	No	Note 1
SN6	Petaluma River	No	No	
SN7	Petaluma	No	No	
SO1	Mare Island	No	No	
SO2	Benicia	Yes	No	P-81 probably historic bldg; Note 1
SO5	Denverton	No	Yes	
SO7	Benicia	No	No	
SO8	Benicia	No	No	
SO9	Benicia	Yes	Yes	
SO10	Benicia	No	Yes	
SO12	Fairfield South	No	No	

Note:

1. Certain Backbone sites are located in areas where historic research indicates the presence of an archeological site, but no site-specific surveys and/or follow-up evaluation are known to have been conducted.

cultural resources investigations as part of past CEQA reviews and 43 had not. In addition to these 75 sites, 15 other WT locations overlap archaeological sites that were recorded either informally or in studies by academic institutions before CEQA regulations required such studies.

The high number of WT sites that contain or are near recorded archaeological sites should be considered a reliable gauge of the likelihood that additional archaeological sites would be found if formal surveys were undertaken in areas not previously surveyed. When N.C. Nelson undertook his survey of the Bay margins at the beginning of the 20th century, he focused on the larger and most easily accessible of the shell mounds. His research strategy at the time clearly did not compel him to complete a thorough search of the Bay margins and adjacent lands for signs of occupation.

Subsequent formal archaeological studies driven by CEQA and the National Historic Preservation Act have led to the discovery of numerous additional shell mounds in Bay margin

settings as development has opened up formerly restricted areas for research. Actual development activities have led to the discovery of numerous additional archaeological deposits, buried under fill and buildings (in particular, the World War II ship building locations) which took advantage of the Bay shoreline beginning in the mid 20th century and extending up to the present.

In summary, the original premise that Native American villages were located in restricted locations at the beginning of the 20th century has changed to an understanding that seasonal villages and procurement sites have been found and will be found at almost any location along the Bay shoreline. Population densities in late prehistoric times were such that very little of the shoreline was not utilized for living or food procurement over the past 2000 years.

3.10.4 REGULATORY SETTING

Numerous laws and regulations require federal, state, and local agencies to consider the effects a project may have on cultural resources. These laws and regulations stipulate a process for compliance, define the responsibilities of the various agencies proposing the action, and prescribe the relationship among other involved agencies (e.g., State Office of Historic Preservation [OHP] and the Advisory Council on Historic Preservation).

FEDERAL REGULATIONS

The National Historic Preservation Act (NHPA) of 1966, as amended, is the primary federal law governing and affecting preservation of cultural resources of national significance. The NHPA defines the nation's policy for the protection and preservation of the country's most significant cultural resources, which are those resources identified as eligible for listing in the National Register of Historic Places (National Register). Cultural resources eligible for the National Register are referred to as historic properties. Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires Federal agencies to take into account the effects of their undertakings on historic properties, and give the Advisory Council on Historic Preservation a reasonable opportunity to comment. The historic preservation review process mandated by Section 106 is outlined in "Protection of Historic Properties" (36 CFR Part 800), effective January 11, 2001. Section 106 consultation could be triggered for work done on a site located on federal land, managed by a federal agency, or requiring a federal permit.

To be eligible for listing in the National Register, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures and objects of potential significance must meet one or more of the following four established criteria, as defined under Title 36 Code of Federal Regulations (CFR) Part 60.4:

1. Are associated with events that have made a significant contribution to the broad patterns of our history
2. Are associated with the lives of persons significant in our past
3. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction
4. Have yielded, or may be likely to yield, information important in prehistory or history

In addition to meeting these four criteria, a historic property must also possess integrity. The various aspects of integrity include location, design, setting, materials, workmanship, feeling, and association. Furthermore, unless the resource possesses exceptional significance, it must be at least 50 years old to be considered for National Register listing.

The implementing regulations for the protection of historic properties are defined under Title 36 Code of Federal Regulations (CFR) Part 800. The regulation defines effect and adverse effect on historic properties as follows:

1. Section 800.9(a) Criterion of Effect: An undertaking has an effect on a historic property when the undertaking may alter characteristics of the property that may qualify it for inclusion in the National Register. For the purpose of determining effect, alteration to features of a property's location, setting, or use may be relevant depending on a property's significant characteristics and should be considered.
2. Section 800.9(b) Criteria of Adverse Effect: An undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to:
 - Physical destruction, damage, or alteration of all or part of the property
 - Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;
 - Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting
 - Neglect of a property resulting in its deterioration or destruction, and/or
 - Transfer, lease, or sale of the property without adequate provisions to protect historic integrity

STATE REGULATIONS

The California Environmental Quality Act and the California Register of Historical Resources, Public Resources Code (PRC) 5024, are the primary State laws governing and affecting preservation of cultural resources of national, state, regional, and local significance. Policy for the protection and preservation of the State's most significant cultural resources is found in various sections of CEQA, the State CEQA Guidelines, and in statutes of the PRC.

Under CEQA, a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. For purposes of this section, an historical resource is a resource listed in, or determined eligible for listing in, the California Register of Historical Resources (California Register) (PRC 1992).

Consequently, under Section 21084.1 of the PRC, an historic resource eligible for the California Register would by definition be an historic resource for purposes of CEQA compliance. The regulations for nominating resources to the California Register were published January 1, 1998. Under the regulations, a number of historic resources are automatically eligible for the California Register if they have been listed under various state, national or local historic resource criteria.

California historic resources listed in, or formally determined eligible for, the National Register are automatically listed on the California Register (PRC 5024.1).

In order for a resource to be eligible for the California Register, it must satisfy all of the following three criteria:

1. A property must be significant at the local, state or national level, under one or more of the following four criteria of significance (these are essentially the same as National Register criteria with more emphasis on California history):
 - The resource is associated with events or patterns of events that have made a significant contribution to the broad patterns of local or regional history and cultural heritage of California or the United States
 - The resource is associated with the lives of persons important to the nation or to California's past
 - The resource embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values
 - The resource has the potential to yield information important to the prehistory or history of the state or the nation
2. The resource retains historic integrity (defined below), and
3. It is 50 years old or older (except for certain cases described in the California Register regulations).

The California Register regulations define “integrity” as “... the authenticity of a property's physical identity, evidenced by the survival of characteristics that existed during the property's period of significance.” That is, it must retain enough of its historic character or appearance to be recognizable as an historical resource. Following the National Register integrity criteria, California Register regulations specify that integrity is a quality that applies to historic resources in seven ways: location, design, setting, materials, workmanship, feeling and association. A property must retain most of these qualities to possess integrity.

The use of the phrase “...appears potentially eligible or not eligible” for the California Register, which is used in the impact discussion below, is standard practice in an evaluation discussion. Only the State Office of Historic Preservation can make an actual determination of eligibility for the California Register.

3.10.5 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Improvements associated with the development of the WT could cause direct and indirect impacts to both historic and prehistoric cultural resources. Of these two categories, impacts could occur with greater frequency to prehistoric sites, which are anticipated to be found all along the San Francisco Bay margin and only some of which have been discovered and recorded already.

Impacts would be considered significant if they:

- Cause a substantial adverse change in the significance of, or loss of, a historic resource
- Cause a substantial adverse change in the significance of, or loss of, an archaeological resource
- Disturb any human remains

METHODOLOGY

The significance of project impacts on cultural resources is related to the following factors: the presence, nature, and importance of any cultural resources that may be present in the treatment area (i.e., the work area); the location, size, and access requirements of the treatment areas; and the need for heavy equipment. The location of the WT sites and the potential types and extent of improvements associated with implementation of the WT were evaluated to assess potential impacts to cultural resources.

REGIONAL IMPACTS AND MITIGATION MEASURES

IMPACT CULT-1: DISTURBANCE TO PREHISTORIC ARCHAEOLOGICAL DEPOSITS DURING USE OF THE WATER TRAIL

Improvement of access to points along the Bay margin and/or the incremental growth in NMSB use associated with implementation of the WT could result in an increase in boat landing and pedestrian traffic to areas not designated as trailheads. Casual damage to, and removal of, identifiable historic resources and archaeological deposits may result from NMSB users accessing various shoreline areas away from trailheads, as well as areas in the vicinity of trailheads. Although the WT would include a significant educational and signage component, which could increase awareness of and sensitivity to cultural resources, the WT strategies do not specifically address protection of cultural resources (Strategy 2 indicates that known cultural resources are an item that would potentially be of interest to WT users). Artifacts that could be damaged or removed from these locations may include human bone (almost all of the Bay margin shell middens are also cemeteries) as well as other cultural materials. These direct and indirect effects could result in **potentially significant but mitigable** regional impacts to Bay-shore cultural resources. With implementation of mitigation measure Cult-M1, this impact would be less than significant.

MITIGATION MEASURE CULT-M1: INCLUDE PROTECTION OF CULTURAL RESOURCES IN EDUCATION AND OUTREACH EFFORTS

The WT education and outreach program shall inform WT users about the potential or actual cultural resource that may be present at or in the vicinity of a WT site, and shall educate users about protection of cultural resources, including the fact that disturbance or removal of any artifact is illegal, and the potential penalties associated with such actions. Information collected as part of mitigation measure Cult-M1 and/or other means shall be included in educational and outreach materials as appropriate.

SITE-SPECIFIC IMPACTS AND MITIGATION MEASURES

IMPACT CULT-2: DISTURBANCE TO PREHISTORIC ARCHAEOLOGICAL DEPOSITS DURING FACILITY IMPROVEMENTS AND/OR USE OF THE WATER TRAIL

Implementation of the WT could impact known or suspected prehistoric archaeological deposits directly through various types of facility improvements at WT trailheads. In addition, increased use of certain sites due to WT publicity and/or site improvements could lead to increased use of adjacent areas, which could result in casual damage or removal of artifacts. Artifacts that could be damaged or removed from these locations may include human bone (almost all of the Bay margin shell middens are also cemeteries) as well as other cultural materials. These direct and indirect effects could result in **potentially significant but mitigable** impacts to cultural resources at individual sites. With implementation of mitigation measures Cult-M2A and Cult-M2B, this impact would be less than significant. Mitigation measure Cult-M1 also applies to this potential impact.

MITIGATION MEASURE CULT-M2A: UNDERTAKE EXPANDED ARCHIVAL RESEARCH AND FIELD INVESTIGATIONS TO PROVIDE INFORMATION ABOUT POTENTIAL PREHISTORIC ARCHAEOLOGICAL DEPOSITS

As part of the trailhead designation process, expanded archival research and/or field inspections shall be undertaken for all those WT locations where project-related earthmoving or excavation is planned, whether or not previous archaeological sites have been recorded in the immediate area. As noted above, 19th and 20th century alterations of the Bay margins have buried or obscured prehistoric sites in numerous locations. Archaeological sites could exist directly underneath existing buildings, pavement and historic fill materials.

In those areas where archaeological sites have been recorded at or in close proximity to the proposed WT facilities, during the evaluation of Trailhead Plans that would involve excavation, an archaeologist shall determine if it is necessary to conduct limited programs of mechanical subsurface presence/absence testing to search for deposits which may be damaged by actual earthmoving activities. If deemed necessary by an archaeologist, mapping of the spatial extent of the archaeological deposits found during field inspections or mechanical subsurface testing shall be done in advance of final construction designs so that preservation of the deposits can be achieved through avoidance of impacts.

MITIGATION MEASURE CULT-M2B: PROTECT PREHISTORIC ARCHAEOLOGICAL REMAINS IN ADJACENT AREAS

In those areas where archaeological sites have been recorded at, or in close proximity to, the proposed WT facilities, and archival or archeological review indicates a potential for damage to the site from trailhead use or improvements, Trailhead Plans shall avoid features or facilities that could lead to disturbance of these sites, and, if deemed necessary and appropriate, these sites and resources shall be protected by covering with fill and/or landscaping or parking lots, or by fencing. Signage shall be provided to advise boaters to respect and avoid historic resources at such sites.

3.11 HAZARDS AND HAZARDOUS MATERIALS

This section of the EIR discusses potential hazards and hazardous materials impacts that could result from implementation of the WT.

3.11.1 INITIAL STUDY FINDINGS

Eight potential impacts related to hazards and hazardous materials are considered in the Initial Study checklist. The Initial Study concluded that only one of the impacts was potentially significant: One or more of the WT Backbone Sites could be on the Cortese List, a list of hazardous materials sites compiled pursuant to Government Code 65962.5, and as a result could create a significant health hazard to the public or the environment.

3.11.2 REGIONAL SETTING

The Backbone Sites are located in a variety of settings around the Bay, and include sites that are located in current or former industrial areas. Some future sites that may be designated as trailheads under the WT Plan may similarly be located in current or former industrial areas. Some of these sites could have contaminated soil and/or groundwater that has resulted from past or current land uses on, or near, the access site. Because access sites are adjacent to the Bay (and groundwater typically flows towards the Bay) potential WT sites may also be downgradient from sources of groundwater contamination. Potential sources of groundwater contamination include leaks from underground fuel tanks.

3.11.3 LOCAL SETTING

The potential for contamination to be present at a WT site is highly site-specific, and would be evaluated during the trailhead designation process. For most existing sites (i.e., sites constructed since hazardous materials regulations were implemented), site owners will have considered and evaluated the potential for hazardous materials to be present. Similarly, planned sites would also have been evaluated as part of the planning process. Thus, the only potential uncertainty with regard to the potential presence of hazardous substances in the subsurface at a given WT is associated with potential future sites and expansion of existing sites onto new or existing property that has not previously been evaluated.

3.11.4 REGULATORY SETTING

FEDERAL REGULATIONS

At the federal level, storage, management, treatment, and remediation of hazardous waste and sites impacted by hazardous waste is governed by the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). In California, the State has responsibility for implementing RCRA. Other laws and regulations pertain to specific categories of hazardous substances, such as pesticides (the Federal Insecticide, Fungicide and Rodenticide Act). The Clean Water Act regulates discharges of petroleum and other hazardous substances into the waters of the U.S.

STATE REGULATIONS

The State of California has promulgated its own laws and regulations pertaining to the storage, management, treatment, and remediation of hazardous waste and sites impacted by hazardous

waste. The regulations build on the federal statutes, and are typically more stringent than the corresponding federal requirements, as described in Section 3.2. As noted above, California has been authorized to implement the provisions of RCRA within the state. The Hazardous Substances Account Act of 1981 (reauthorized in 1999)⁴⁷ describes site remediation requirements.

The Water Board may also promulgate site cleanup requirements (Cleanup and Abatement Orders) if there is a known or potential discharge to the waters of the state. Contaminated sites and known sources of contamination are documented in the Hazardous Waste and Substance Sites List (the Cortese List). The list contains a list of known or potentially contaminated sites provided to the California EPA by the California Department of Toxic Substances Control (DTSC), Department of Health Services, California State Water Resources Control Board (SWRCB), and the Integrated Waste Management Board. The list represents data collected by different agencies. It includes sites that represent a wide range of potential concerns with respect to their potential to cause harm to humans and wildlife if disturbed and contaminants released. Information on most Cortese List sites is available from the Department of Toxic Substances Control (DTSC) Envirostor database.⁴⁸ The Water Board maintains a list of “active” Cease and Desist (CDO) and Cleanup and Abatement Order (CAO) cases from Water Board that are also included on the Cortese List. DTSC also maintains a list of properties with land use restrictions that were entered into with DTSC to control potential health hazards at sites with residual contamination. No solid waste disposal sites or hazardous waste facilities subject to corrective action are located near the Backbone Sites.

LOCAL AND REGIONAL REGULATIONS

Local jurisdictions may have additional requirements pertaining to the handling, management, and storage of hazardous substances. Any such regulations would be more stringent than applicable state and federal regulations, and as such would serve to reduce the potential for impacts, if any. Sites representing a low level of concern, including certain leaking underground storage tank sites, may be addressed at the local level.

3.11.5 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Impacts would be considered significant a portion of the project:

- Is located on a site that contains contaminated soil and/or groundwater, and site-related activities could cause a disturbance of the contamination leading to significant health hazards to the public or the environment

METHODOLOGY

Potential human or wildlife impacts from contaminated soil and groundwater can occur only if there is contact with the affected soil or groundwater. To evaluate potential impacts associated with contaminated soil and/or groundwater at potential WT sites, potential WT activities that could release contaminated soil and/or groundwater were identified. These include excavation

⁴⁷ Health & Safety Code, Division 20, Chapter 6.8 (HSC § 25300 et seq.)

⁴⁸ <http://www.envirostor.dtsc.ca.gov/public/>

(which could result in the release of contaminated soil, and groundwater if the excavation is sufficiently deep to encounter groundwater) and disturbance of shallow soil through grading.

REGIONAL IMPACTS AND MITIGATION MEASURES

Potential impacts from hazardous materials and corresponding mitigation measures are site-specific and present no regional impacts.

SITE-SPECIFIC IMPACTS AND MITIGATION MEASURES

IMPACT HAZ-1: EXPOSURE OF WORKERS, THE PUBLIC, OR WILDLIFE TO CONTAMINATED SOIL OR GROUNDWATER FROM SOIL EXCAVATION

Sites that are located in areas that have previously had industrial activities, or are located downgradient of current or former industrial areas could potentially have contaminated soil and/or groundwater. Humans or wildlife could be exposed to contaminants contained in soil or groundwater if that soil or groundwater is disturbed by excavation, grading, or other intrusive activities. Potential exposures of concern would occur if chemical concentrations in soil or groundwater exceed applicable risk thresholds or screening standards. DTSC has developed the California Human Health Screening Levels (CHHSLs) that provide acceptable concentrations of contaminants in soil for residential and commercial/industrial uses. The Water Board has developed similar screening levels for contaminated soil and groundwater called Environmental Screening Levels (ESLs) (RWQCB 2008). NOAA has published screening levels for wildlife (ecological receptors). Typical conservative screening levels used to assess potential impacts to wildlife include the No Observed Adverse Effects Levels (NOAELs) and Lowest Observed Adverse Effects Levels (LOAELs). Human health screening levels are also available from USEPA Region 9 (Regional Screening Levels, or RSLs (USEPA 2009)).

The Water Board also provides screening criteria for reuse of dredged material in wetland creation (RWQCB 2000). These criteria provide an assessment of sediments that may be safely used to construct wetlands, and provide a guide for levels of chemicals in sediments that could cause an adverse effect on the environment. These criteria are based on the NOAA criteria, but reflect ambient (existing) background concentrations of certain compounds in San Francisco Bay.

High Opportunity Sites would require only signage, and therefore would not require activities that could disturb contaminated soil or groundwater. Development of the remaining Backbone Sites and potentially new sites not included in the WT Plan may disturb soil or groundwater that was contaminated due to past site uses. In addition, dewatering of contaminated groundwater during construction could result in contaminated groundwater being discharged to the Bay or other nearby waterways.

Proper implementation of construction activities in accordance with existing laws and regulations would require an evaluation of the potential presence of contaminated soil, sediment, and groundwater, and implementation of appropriate protective measures, including a site-specific health and safety plan, if contamination is present. The existing regulations mandate a strict level of protection for potential human and ecological receptors. This impact is **less than significant** and no mitigation is required.

3.12 HYDROLOGY AND WATER QUALITY

This section identifies potential hydrological and water quality impacts that could result from the proposed project.

3.12.1 INITIAL STUDY FINDINGS

The Initial Study determined that potential run-off from trailheads and placement of structures into the 100-year flood plain were potentially significant impacts associated with the WT. The placement of structures into the 100-year flood plain was considered in the context of sea level rise. All other potential hydrological and water quality impacts were determined to be less than significant in the Initial Study.

3.12.2 REGIONAL SETTING

HYDROLOGY

The San Francisco Bay is the largest estuary on the West Coast of the United States. The estuary, comprised of Central San Francisco Bay, the South Bay, San Pablo Bay, Suisun Bay, and the Sacramento-San Joaquin Delta, drains over 40 percent of California including the Sierra Nevada and Central Valley. The Sacramento and San Joaquin rivers collectively contribute roughly 95 percent of the total freshwater input to the estuary; the other five percent is provided by creeks and streams that drain directly into the Bay. Approximately 25 percent of the water that would otherwise flow through the Delta and into the Bay is instead diverted from the Delta and sent to the Central Valley and Southern California for use as irrigation and drinking water. Water that does make it through the Delta then flows through Suisun Bay, the Carquinez Strait, and San Pablo Bay before entering San Francisco Bay. From there, water either flows into the South Bay or exits the Estuary into the Pacific Ocean through the Golden Gate. The Bay Area has a Mediterranean climate with highly seasonal precipitation and runoff with more than 90 percent of annual runoff occurring during the October-April rainy season.

The Estuary is a “mixed-diurnal” tidal system of two high tides and two low tides of unequal magnitude each day. During each tidal cycle (approximately 24.5 hours) there is a higher-high, high, low, and lower-low tide. The heights of each high and low tide are different every day, reflecting the spring-neap⁴⁹ tidal cycle (alternating approximately every 2 weeks due to the moon’s cycle) and seasonal effects. This tidal exchange is a fundamental determinant of water surface levels, direction, volume of flow and salinity and thereby exerts a fundamental influence on the biological, chemical, and physical conditions of the Estuary.

Freshwater inflows, tidal flows, and their interactions largely determine variations in the hydrology of the estuary. Hydrology has profound effects on all the species that live in the Bay/Delta because it determines the salinity in different portions of the estuary and controls the

⁴⁹ During spring tidal cycles the tidal range (difference between higher high tides and lower low tides) is greater than during neap cycles. Spring tides occur at the time of a new moon or full moon; at these times the high tides are higher and the low tides are lower than the corresponding tides during neap tide because of the gravitational effects of the straight-line alignment of the moon, earth, and sun. Neap tides occur after the first and third quarters of the lunar month; at these times the high tides are lower and the low tides are higher than the corresponding tides during spring tides because of the gravitational effects of the right-angled alignment of the moon, earth, and sun.

circulation of water through the channels and bays. Circulation patterns within the Bay are influenced by Delta inflows, gravitational currents, and tide- and wind-induced horizontal circulation. The cumulative effects on net circulation within the estuary of the latter three factors tend to dominate that of freshwater inflows except during short periods after large storm events (Smith 1987). Exchanges between individual embayments (the South Bay, Central Bay, San Pablo Bay, and Suisun Bay) are influenced both by mixing patterns within embayments and by the magnitude of freshwater inflows (Smith 1987).

EMBAYMENT CHARACTERISTICS

South Bay

The South Bay is geographically and hydrologically distinct from the northern reach of the San Francisco Bay. The South Bay is a tidally oscillating, lagoon-type estuary, where circulation is limited and variations are determined by water exchange between the northern reach and the ocean. The greatest tidal range in SF Bay is found in the South Bay, where the spring tidal range (mean lower low water [MLLW] to mean higher high water [MHHW]) is approximately nine feet (the spring range is approximately six feet at the Golden Gate).

Direct freshwater inflows are severely limited due to the construction of dams and reservoirs in the watershed and in the summer months the dominant source of freshwater is sewage effluent from the San Jose/Santa Clara Wastewater Treatment Plant (Conomos *et al.* 1979), which is authorized to discharge up to 120 million gallons per day. The South Bay also shows the least amount of salinity stratification due to its greater isolation from freshwater sources (Conomos *et al.* 1985). Water residence times are much longer in the South Bay than in the North Bay. During the summer months when there is little freshwater input, the residence times of water can be on the order of several months. In the winter, when density-driven exchanges occur, the residence time can be less than a month (Walters *et al.* 1985).

North Bay

The northern reach of the Bay, composed of the Central Bay and San Pablo Bay, is a partially to well mixed estuary (depending on the season) that is dominated by seasonally varying river inflow primarily from the Sacramento-San Joaquin Delta and tidal influence through the Golden Gate. Due to its location immediately east of the Golden Gate, tides and currents within the Central Bay are relatively more strongly influenced by the Golden Gate than by Delta outflow, especially during the dryer months of the year. The tidal amplitude increases somewhat in the North Bay from the Golden Gate to the eastern shores of San Pablo Bay, where it is the highest. The tides are then attenuated when passing through the Carquinez Strait so that the tidal range is diminished in Suisun Bay (Walters *et al.* 1985). A deep relict river channel running approximately 47 miles from the Golden Gate to the confluence of the Sacramento and San Joaquin Rivers enhances estuarine circulation; this relict channel is used today as a shipping lane.

The salinity in the North Bay decreases somewhat relative to the Golden Gate with salinities being reduced by Delta outflow and in the winter by additional local stream and river inflows. The timing and magnitude of the highly seasonal river inflow alters the circulation of the North Bay, which is largely maintained by salinity-controlled density differences between river and ocean waters. Residence times of water in the North Bay can be as low as days during periods of high river discharge, or months in drier periods.

Suisun Bay

Suisun Bay is the most complex of the embayments in the Estuary. It is a system made up of several open water areas, sloughs, and the adjacent Suisun Marsh. The Sacramento and San Joaquin Rivers enter the estuary at the eastern end of Suisun Bay and as a result, the salinity gradient in Suisun Bay is the greatest found in the estuary. The salinity of Suisun Bay varies greatly depending on Delta outflow.

Tidal wave energy is dramatically reduced as it travels across Suisun Bay and through the sloughs in Suisun Marsh. The western end of Suisun Marsh is strongly influenced by the tides as they propagate into the Marsh through Grizzly Bay, while the tides in the eastern Marsh are significantly less energetic due to a strong dissipation of the tidal wave as it passes through Suisun Bay (Walters *et al.* 1985). The tides also dissipate as they propagate through the narrow, sinuous network of channels in the Marsh, leading to a general reduction in tidal forcing from south to north. The residence time in Suisun Bay is similar to that in the North Bay, varying from days during periods of high river discharge to months during drier periods.

SEA LEVEL RISE

A variety of estimates quantify the range of potential sea level rise, report observed trends and offer predictions of global warming and the potential impacts (Watson 2001, CCCC 2006, IPCC 2007). The most recent report from the Intergovernmental Panel on Climate Change (IPCC 2007) contains a midrange projection of sea level rise this century of 8-17 inches (0.7-1.4 ft), with a full range of variability of 7-23 inches (0.6-1.9 ft). The IPCC estimate conservatively assumes no “speculative” critical threshold changes in Greenland or Antarctic ice sheet wasting, a process that would substantially accelerate and amplify projected rise in sea level (Overpeck *et al.* 2006). Empirical estimates of sea level rise produced by other researchers project a mid-range rise this century of 28-39 inches (2.3–3.3 ft) with a full range of variability of 20-55 inches (1.7-4.6 ft), substantially higher than IPCC 2007 projections (Rahmstorf 2007). The CALFED Bay-Delta Program recommends using the higher estimates for all planning efforts in the Delta (Mount 2007). Other recent estimates by the California Climate Change Center⁵⁰ report sea level rise in California over the past century to be approximately 7 inches (0.6 ft), and project increases of 22 to 35 inches (1.8 to 2.9 ft) by 2100 (CCCC 2006).

The projected changes in climate will change the frequency and patterns of storms compared to historical conditions. The projected increase in storms, coupled with the projected increase in sea levels will increase the vulnerability of coastal regions to flooding (CCCC 2006). An increase in sea level of one foot means that storm surge-induced floods that formerly occurred on average at 100-year intervals would more likely occur at 10-year intervals (CCCC 2006). Local sea-level rise depends upon a number of physical factors including local land vertical movement (uplift/subsidence) and hydrodynamic responses.

WATER QUALITY

The primary water quality parameters of concern in the Bay are salinity, dissolved oxygen (DO), pH, total suspended solids (TSS)/turbidity, and chemical and biological pollutants. Because the

⁵⁰ The California Climate Change Center report is a multi-institution collaboration among the California Air Resources Board, DWR, California Energy Commission, CalEPA, and the Union of Concerned Scientists.

project has no, or minimal, potential to affect salinity, pH, or DO, those items are not discussed further. Suspended solids/turbidity, and chemical and biological pollutants are addressed below.

TOTAL SUSPENDED SOLIDS AND TURBIDITY

Turbidity and total suspended solids (TSS) are generally used as measures of the quantity of suspended particles, which can comprise a mineral component (silts, clays, etc.) and a biological component (plankton). Particles can become suspended in a water body by multiple actions including direct inputs from rivers and surface runoff, wind-driven re-suspension of sediment by waves, tidal currents, mining and dredging activities, disturbance by boats or wildlife, and algae growth in the water column.

Shallow areas and channels adjacent to shallow areas have the highest suspended sediment concentrations. TSS levels vary throughout the Bay depending upon season, tidal stage, and depth. The Central Bay generally has the lowest TSS concentrations; however, spatial variations in the processes influencing re-suspension can cause highly variable differences in local TSS values. San Pablo Bay and the South Bay generally have higher concentrations due to their shallow depths that facilitate local sediment resuspension by the many processes mentioned above.

CHEMICAL POLLUTANTS

The pollutant loading to San Francisco Bay has long been recognized as one of many factors that have historically stressed aquatic resources. Pollutants enter the aquatic system through atmospheric deposition, runoff from agricultural and urbanized land, and direct discharge of municipal and industrial wastewater. Common pollutants in the Bay include nutrients (especially nitrogen and phosphate), metals (such as copper and lead), and organic/inorganic chemicals from industrial and municipal sources. For the WT, the pollutants of greatest concern are petroleum products (oil and grease) that are common in runoff from impervious surfaces in developed areas. These pollutants would be found on the parking lots and roads servicing WT launch sites and could be washed into the Bay in stormwater runoff.

The Bay's sediment can be both a source of and a sink for pollutants in the overlying water column. The overall influx of pollutants from the surrounding land and waste discharges can cause increases in sediment pollutant levels. Natural resuspension processes, biological processes, dredging and other mechanical disturbances, and sediment disposal can remobilize particulate-bound pollutants.

BIOLOGICAL POLLUTANTS

Biological pollutants include bacteria and viruses that could pose health hazards to humans contacting the water, and various organic compounds that can lead to biological oxygen demand within sediments and the water column. Bacterial and viral biological pollutants (e.g., enterococci and fecal coliforms) could pose a health hazard to NMSB users. Potential sources of harmful bacteria and viruses to the Bay include runoff, combined sewer outflows, boat discharges, and tidal flows from areas that receive heavy use by wildlife, especially birds (i.e., salt ponds). Levels of harmful bacteria in the Bay are generally higher during the rainy season, when runoff transports bacteria, viruses and other pollutants into the Bay from fringing urban and agricultural areas. The spatial distribution and composition of bacteria and viruses within the

Bay are highly localized, as they are generally dependent upon surrounding land uses and the nature of hydrologic connections between the Bay and its many watersheds.

SEDIMENT QUALITY

Sediment quality in the Bay varies greatly according to the physical characteristics of the sediment, proximity to historical waste discharges, physical/chemical condition of the sediment, and sediment dynamics that change with location and season. Generally the level of sediment contamination at a given location will vary depending on the rate of sediment deposition, which varies with seasons and tides. Chemical contaminant dynamics in an estuary are closely associated with the behavior of suspended and deposited sediments and estuarine circulation patterns and processes. Overall, the physical and chemical characteristics of sediments, and the bioavailability and toxicity of sediment-associated chemicals to aquatic organisms, are particularly important in determining their potential impact on environmental quality. Potential sediment disturbance associated with the implementation of the WT would be due to in-water construction activities at a trailhead.

3.12.3 LOCAL SETTING

Existing water quality is expected to vary from trailhead to trailhead, depending on the types and quantities of discharges potentially present in the vicinity of the trailhead. Water quality can also be affected by accidental releases from sewage treatment facilities. For example, on January 31, 2008, the Sewage Authority of Southern Marin accidentally released an estimated 2.7 million gallons of partially treated sewage and stormwater (City of Sausalito 2008).

Similarly, sediment quality may vary from trailhead to trailhead, depending on the types and quantities of discharges present or historically present in the vicinity of the trailhead, as well as the local and regional sediment deposition patterns (i.e., sources of sediments to a specific trailhead location).

3.12.4 REGULATORY SETTING

FEDERAL REGULATIONS

Actions that may affect surface and groundwater quality or that may impact the hydrology of San Francisco Bay are subject to regulation by the CWA and to requirements established by the USEPA (Section 3.2.1). The State Water Resource Control Board (SWRCB) and the RWQCB, the agencies that implement the CWA, have developed Basin Plans, which provide policies and additional standards regarding water discharges, dredging, filling, storm water runoff, and a site's contaminant cleanup if they have the potential to affect the Bay waters. In addition the RWQCBs issue waste discharge permits with specific discharge requirements for activities such as the construction and operation of trailheads where the construction would affect the Bay waters during construction, maintenance or use of the site.

STATE AND LOCAL REGULATIONS

Project-related activities that may impact the hydrology of the Estuary would be regulated under the Porter-Cologne Water Quality Act and the McAteer-Petris Act.

PORTER-COLOGNE WATER QUALITY ACT

Actions that may affect surface and groundwater quality are subject to regulation by the Porter Cologne Water Quality Act and to requirements established by the SWRCB, the RWQCB, and the local municipalities where the activities will occur. Any project activities occurring within flood zones will be subject to regulation by the local flood control agencies. The San Francisco Bay RWQCB is the primary agency responsible for protecting water quality in natural waters (“Waters of the State”) within the Bay.

The RWQCB’s *San Francisco Bay Basin Water Quality Control Plan* (Basin Plan) (RWQCB 2007) designates existing and potential beneficial uses for each water body within its geographic region, sets numeric and narrative water quality objectives to protect the beneficial uses, and describes strategies and time schedules for achieving these water quality objectives. The following beneficial uses have been identified for the shoreline waters of the Bay and are discussed in detail in the Basin Plan:

- Estuarine Habitat
- Industrial Service Supply
- Marine Habitat
- Fish Migration
- Navigation
- Industrial Process Supply
- Preservation of Rare and Endangered Species
- Water Contact Recreation
- Non-contact Water Recreation
- Shellfish Harvesting
- Wildlife Habitat

Generally speaking, uses associated with human consumption, water contact recreation, and biological/ecological resources are associated with more stringent water quality objectives than non-contact recreational activities. While the RWQCB performs a number of educational, advisory, and planning roles related to improving water quality throughout the Bay, its primary mechanisms to protect ground and surface waters are through adopting, monitoring compliance with, and enforcing waste discharge requirements and water quality certification permits. Such permits may be required for new facilities constructed as part of the WT.

The Basin Plan includes specific goals for TSS/turbidity; oils and greases, and petroleum products; and biological contaminants, as outlined below.

Turbidity

The Basin Plan requires that the suspended sediment load and suspended sediment discharge rate of surface waters not be altered in such a manner as to cause nuisance or adversely affect beneficial uses. The goals also state that waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. TSS is measured in Nephelometric Turbidity Units (NTU), a measure of light penetration. Increases in suspended sediment reduce light penetration.

Increases in TSS related to waste discharge shall not be greater than 10 percent in areas where natural turbidity is greater than 50.NTU.

Oils, Greases, and Petroleum Products

The Basin Plan states that Waters shall not contain oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect beneficial uses (RWQCB 2007). The Basin Plan also prohibits the discharge of oil or any residuary product of petroleum to the waters of the state. It specifically regulates the discharge of petroleum products from sources such as treated groundwater or petroleum contaminated soil as well as any other discharge to surface waters. The RWQCB also has programs to control and reduce stormwater runoff during construction and from parking lots, roadways and other infrastructure.

Biological Contaminants

Biological contaminants are also regulated in the Basin Plan, although unlike many other water quality criteria, the criteria for bacteria are dependent upon the use of the water in question. Table 3.12.4-1 presents water quality objectives for fecal and total coliform bacteria as outlined by the RWQCB for various beneficial uses. Table 3.12.4-2 presents the EPA’s water quality criteria for enterococci and *E. coli* for various levels of water contact recreation.

MCATEER-PETRIS ACT

The Bay Plan prepared by BCDC addresses several water quality issues. It states that the water quality in the Bay should be maintained and support the beneficial uses of the Bay as described in the RWQCB’s Basin Plan. The Bay Plan also states that shoreline projects should be designed in a way that reduces erosion and protects the Bay from sedimentation. BCDC also requires that polluted runoff be controlled by the use of best management practices to protect the water quality and beneficial uses, including placing runoff discharge points at areas that will have the least impact.

The Bay Plan has specific policies for dredging and filling the Bay. Fill will only be allowed when it is demonstrated that it is the minimum amount necessary to achieve the purpose for the fill (Section 66605). The Act does allow for limited “minor fill for improving shoreline appearance or public access” (Section 66605). Any fill must minimize the harmful effects of the fill. The extent, nature, and location of any fill must be designed to avoid reducing the surface area of the Bay, or impacts to water quality, the quality of habitat or fish resources, and/or the environment as described in Section 21060.5 of the Public Resource Code. Dredging must meet criteria including that the applicant demonstrated that dredging is for water oriented uses, the material meets water quality standards, important fish and Bay resources would be protected, the project design will minimize the volume necessary, and the sediment will be reused or otherwise disposed outside the BCDC jurisdiction where feasible.

TABLE 3.12.4-1. WATER QUALITY OBJECTIVES FOR COLIFORM BACTERIA

Beneficial Use	Fecal Coliform (MPN/100ml)	Total Coliform (MPN/100ml)
Water Contact Recreation	geometric mean < 200 90th percentile < 400	median < 240 no sample > 10,000
Shellfish Harvesting ^b	median < 14 90th percentile < 43	median < 70 90th percentile < 230 ^c
Non-contact Water Recreation ^d	mean < 2000 90th percentile < 4000	
Municipal Supply: Surface Water ^e Groundwater	geometric mean < 20	geometric mean < 100 < 1.1 ^f

NOTES:

- a. Based on a minimum of five consecutive samples equally spaced over a 30-day period.
- b. Source: National Shellfish Sanitation Program.
- c. Based on a five-tube decimal dilution test or 300 MPN/100 ml when a three-tube decimal dilution test is used.
- d. Source: Report of the Committee on Water Quality Criteria, National Technical Advisory Committee, 1968
- e. Source: DOHS recommendation.
- f. Based on multiple tube fermentation technique; equivalent test results based on other analytical techniques, as specified in the National Primary Drinking Water Regulation, 40 CFR, Part 141.21(f), revised June 10, 1992, are acceptable.

TABLE 3.12.4-2. US EPA BACTERIOLOGICAL CRITERIA FOR WATER CONTACT RECREATION

(in colonies per 100 ML)	Fresh Water		Salt Water
	Enterococci	<i>E. Coli</i>	Enterococci
Steady State (all areas)	33	1226	35
Maximum at:			
designated beach	61	235	104
moderately used area	89	298	124
lightly used area	108	406	276
infrequently used area	151	576	500

NOTES:

- 1. The criteria were published in the Federal Register, Vol. 51, No. 45 / Friday, March 7, 1986/8012-8016. The criteria are based on:
 - (a) Cabelli, V.J. 1983. Health Effects Criteria for Marine Recreational Waters. U.S. EPA, EPA 600/1-80-031, Cincinnati, Ohio, and
 - (b) Dufour, A.P. 1984. Health Effects Criteria for Fresh Recreational Waters. U.S. EPA, EPA 600/1-84-004, Cincinnati, Ohio.
- 2. The U.S. EPA criteria apply to water contact recreation only. The criteria provide for a level of production based on the frequency of usage of a given water contact recreation area. The criteria may be employed in special studies within this region to differentiate between pollution sources or to supplement the current coliform objectives for water contact recreation.

BCDC has also developed a draft climate change strategy (April 2009) and is currently reviewing amendments to the Bay Plan to address climate change (BCDC 2009a,b). In addition, BCDC has also developed regional mid-century sea level rise maps (based on a 16-inch rise in sea level) and end of the century maps (based on a 55-inch rise in sea level) as well as a composite of both of these maps (BCDC 2009c).

The proposed amendments would add a new climate change policy section to the Bay Plan that includes:

- Using the predicted sea level rise scenarios to guide planning and the permit process
- Developing a strategy to protect the shoreline from sea level rise, storm inundation, flooding, and other related impacts
- Working with other state, local, and federal agencies to evaluate and integrate regional mitigation, ongoing adaptive management strategies, environmental justice issues, research, and other related climate change tools
- Promote wetland protection, enhancement, and creation, and
- Discourage development in undeveloped areas that are not currently protected from erosion and flooding but would be at risk for these hazards if allowed to develop

The proposed amendments would also change existing sections of the Bay Plan. The revisions would:

- Amend the policies on protection of the shoreline to address protection from future flooding
- Amend the policies on safety of fills by updating the findings and policies on sea level rise and moving some policies to the new climate change section of the Bay Plan
- Amend findings and policies on tidal marshes and tidal flats to ensure that buffer zones are incorporated into restoration projects where feasible and sediment issues related to sustaining tidal marshes are addressed, and
- Amend findings and policies on public access to provide public access that is sited, designed and managed to avoid significant adverse impacts from sea level rise and ensure long-term maintenance of public access areas

3.12.5 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Criteria for determining significant impacts to hydrology and water quality were based on the State CEQA Guidelines and professional judgment. Impacts would be considered significant if the project would:

- Create or contribute runoff water that would provide substantial additional sources of polluted runoff
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows (discussed below in the broader context of sea level rise).

METHODOLOGY

Impacts to hydrology and water quality were assessed by evaluating all potential direct, indirect, temporary, and permanent sources of run-off associated with implementation of the WT, and the

potential effect of facility improvements on flood flows in the 100-year flood plain. Potential impacts could occur through the following mechanisms:

- Changes in water quality due to short-term construction activities
- Changes in water quality due to long-term use of facilities, and
- Placement of structures within 100-year flood areas

REGIONAL IMPACTS AND MITIGATION MEASURES

The regional impacts of the WT project on the hydrology and water quality of the Bay would be limited to impacts related to increased impermeable surfaces in the watershed. The proposed increase in impermeable areas due to the WT and the cumulative regional projects would be *de minimis* within the scope of development in the Bay Area, and would not substantially increase pollution in the Bay. In addition, new or expanded WT facilities and parking would be highly dispersed around the Bay, and impacts would be further mitigated by measures HYD-M1 and HYD-M2 described below to address potential site-specific impacts. For these reasons, the WT project is not expected to have a regional effect on water quality in the Bay.

SITE-SPECIFIC IMPACTS AND MITIGATION MEASURES

IMPACT HYD-1: LOCAL DEGRADATION OF WATER QUALITY DUE TO CONSTRUCTION ACTIVITIES

This impact could occur as a result of the construction of new launch/destination facilities and the upgrading of existing facilities consistent with the WT Plan. Specific activities could include the construction and improvement of boat launching ramps at the water's edge, parking facilities, boat storage facilities, camping facilities, restroom facilities, and other features. During these activities it is possible that local water quality could be impacted in a number of ways. Construction activities at the water's edge could cause a localized increase in suspended sediments in the adjacent water body and pollutants such as petroleum products from construction equipment could be introduced directly to the water. The construction of adjacent parking and boat storage facilities and structures, or the development of a camping area could result in sediments and pollutants from construction activities entering the water via runoff. This impact could be **potentially significant but mitigable**. With implementation of mitigation measures Hyd-M1, this impact would be less than significant.

MITIGATION MEASURE HYD-M1: EMPLOY CONSTRUCTION BEST MANAGEMENT PRACTICES

Prior to construction activities involving grading, excavation, or in-water construction at any trailhead, the party responsible for construction shall develop a construction plan that will employ best management practices (BMPs) to reduce environmental impacts. As a part of this process the applicant shall develop a Stormwater Pollution Prevention Plan (SWPPP) through the RWQCB for controlling soil erosion and the discharge of construction-related contaminants. Construction practices shall also minimize the disturbance of sediment during any in-water facility improvements, consistent with the site-specific levels of natural turbidity and level of chemical pollutants present in the sediment that could be disturbed.

IMPACT HYD-2: DEGRADATION OF WATER QUALITY DUE TO RUNOFF FROM TRAILHEADS

The primary potential sources of additional runoff resulting from project implementation are new impervious surfaces from the construction of new or expanded/improved launch facilities and associated parking areas. The runoff from parking areas may contain petroleum compounds from

automobiles and the pavement material itself. The parking facilities would be relatively small and the amount of runoff generated by them should be small. Run-off from boat washing areas and launch/rigging areas would not be expected to be of concern, as boat washing is performed using only water. This impact could be **potentially significant but mitigable**. With implementation of mitigation measures Hyd-M2, this impact would be less than significant.

MITIGATION MEASURE HYD-M2: IMPLEMENT STORMWATER BEST MANAGEMENT PRACTICES

All new parking areas and any other paved areas developed as part of WT trailhead improvements shall be designed and operated using BMPs to minimize, eliminate, or treat runoff, and reduce pollutant levels in the runoff. Such BMPs can include the construction/use of oil and grease traps, vegetated swales, raingardens, stormwater wetlands, or other similar structures that would immobilize and/or biogeochemically treat pollutants before they would be discharged to surface waters. All BMPs shall comply with Clean Water Act Section c.3 requirements for stormwater detention and treatment. In addition, signs shall be posted at all boat washing facilities asking that only water be used to wash boats.

IMPACT HYD-3: DEGRADATION OF WATER QUALITY DUE TO IMPROPER SANITATION

Where restrooms are lacking, biological waste from NMSB users may be released to the waters of the Bay. While the total quantity of such waste would be minimal, local degradation of water quality could occur. The potential number of new users attributable solely to implementation of the WT, however, would be quite small. In addition, WT Strategy 9 recognizes the value of providing restrooms, and calls for restrooms at the majority of WT trailheads. Implementation of Strategy 9 would increase the number of restrooms compared to current conditions, and would reduce the potential impacts associated with new WT users, as well as reducing any potential effects from existing use. Consequently, this potential impact is considered **less than significant**.

IMPACT HYD-4: INCREASED LITTERING IN THE BAY

With the potential increase in NMSB use on the Bay due to the implementation of the WT, there is the potential for an increase in both intentional and unintentional littering. The WT Plan includes measures to decrease the amount of littering by NMSB users through outreach programs and increased signage at launch and destination locations, as well as the overall development of the WT ethic. These actions would inform WT users about proper waste/trash storage and disposal practices. In addition, the improved launch/destination sites would be equipped with facilities for convenient waste/trash disposal and recycling. As recreational users are one of the main groups threatened by poor water quality, WT users would be expected to advocate for better water quality for their own protection. This impact would be **less than significant**.

IMPACT HYD-5: PLACEMENT OF STRUCTURES WITHIN 100-YEAR FLOOD ZONES THAT COULD IMPEDE OR REDIRECT FLOWS

Any new boat launching ramps constructed as part of the project would, out of necessity, be within a 100-year flood zone since they would be on the immediate Bay shore. Restrooms and parking lots also may be within the 100-year flood zone, depending on specific access site elevations and local building code requirements (most of which require raising land surfaces above the 100-year floodplain level). Most of these facilities would not be in the path of flood flows; they would instead be subject to tidal flooding hazards. The parking lots and permanent

structures associated with the WT Plan would be small enough in size and area that their impacts on impeding flood flows would be less than significant.

There is a potential that newly developed/improved trailheads may require adaptation over time for rising sea level (see detailed discussion of sea level rise in Section, 3.15.3, below). This could affect virtually all WT facilities. Depending on elevation, and the extent of sea level rise, any immediate shoreline facility could be under water. Unless boarding float anchorage systems (e.g., pilings) are sufficiently tall, the boarding floats could come loose from anchoring systems during storm surges. Depending on the gradient conditions of the shoreline, boat launching ramps may also need to be modified to remain consistent with pending ABA-ADA Accessibility Guidelines. This impact would be **potentially significant, but mitigable**.

MITIGATION MEASURE HYD-M5: DESIGN ALL NEW PERMANENT STRUCTURES TO ADDRESS POTENTIAL FLOOD HAZARDS

All new permanent facilities (restroom, information kiosks, etc.) proposed as part of the WT access improvement shall be designed and constructed such that the interior floors would be above the 100-year tide/wave heights, including expected sea level rise for the reasonable useful life of the structure. Anchorage piers and other features of boarding floats and floating boat launching ramps, including components pertaining to ADA accessibility, shall be designed to remain functional with anticipated sea level rise for the reasonable useful life of the structure.

3.13 LAND USE PLANNING

This section of the EIR assesses the potential impacts on land uses from the implementation of the WT Plan. Impacts are assessed at the program level only, by comparing the consistency of the WT Plan with land use plans of the federal, state, and regional agencies in whose jurisdictions the 112 WT Backbone Sites fall. Site-specific compliance with local agency land use plans would be evaluated during the trailhead designation process.

Consistency with the federal, state and regional environmental goals and policies that pertain to the protection of plants, birds and other wildlife are addressed in Sections 3.7 through 3.9. Issues associated with parks, land trails, and navigational safety are discussed in Sections 3.3 and 3.4, respectively.

3.13.1 INITIAL STUDY FINDINGS

The project Initial Study found that implementation of the Water Trail may have potentially significant impacts associated with possible conflicts with applicable land use plans, existing nearby land uses, and/or applicable habitat conservation plans (HCPs).

3.13.2 REGIONAL SETTING

The project area includes San Francisco Bay and, in particular, the water and land areas at the edge of the Bay that include existing access points and NMSB use. The land uses surrounding the Bay vary widely, encompassing existing marinas, open space (including parklands, salt ponds and wildlife refuges), ports, residential areas, commercial areas (including hotels and restaurants), and industrial areas. These general areas are summarized as Urbanized Shorelines, Urban/Wildland Interface, and Rural Open Space/Agricultural in Section 3.6, Aesthetics. Typical land uses surrounding the proposed Backbone Sites are summarized below.

3.13.3 LOCAL SETTING

The WT Plan analyzed existing access onto the Bay and concluded that at present there are over 135 formal and informal launch and landing sites suitable for human-powered boats and beachable sail craft. Of those, the general land use categories include:

- Waterfront park (50%)
- Marina/harbor (17%)
- Public boat launching ramp/boarding float (13%)
- Public access area (12%)
- Wildlife refuge/reserve (1%)
- Privately owned business (7%).

Not all existing sites are considered suitable for inclusion in the WT; the WT includes 112 access sites, including 17 planned sites. The project area includes WT access sites that are in heavily industrialized parts of Alameda County, such as around the Port of Oakland (e.g., A8, Middle Harbor Shoreline Park) and Oakland airport (A18, Doolittle Drive, Airport Channel), as well as sites in remote parts of Sonoma (Sn3, Hudeman Slough), Napa (N1, Cutting's Wharf) and Solano Counties (So5, Belden's Landing, Fairfield)

Sites in the North Bay are typically in marinas, parks, and wildlife refuges. Sites located along the East Bay range from parks (e.g., A5, Shorebird Park, Emeryville) and marinas (e.g., A2, Berkeley Marina Ramp) to commercial areas (A9, Jack London Square/CCK) and salt ponds (A24 Jarvis Landing, Newark). A large portion of the southern Bay margin falls within the San Francisco Bay National Wildlife Refuge (including SM25, Corkscrew Slough Viewing Platform, Redwood City and A24 Jarvis Landing, Newark). On the western shore of the Bay, sites are located adjacent to parks (SF2, India Basin Shoreline Park, San Francisco), marinas (SM6, Docktown Marina, Redwood City), commercial areas (SF10, Aquatic Park, San Francisco), and industrialized areas (SF1, Candlestick Point State Recreation Area).

3.13.4 REGULATORY SETTING

Over 50 government agencies have jurisdiction over the 112 Backbone Sites, and any other potential future WT sites around the Bay. These include federal, state, regional, and local agencies with regulations and plans that control development on the margins of the Bay as well as the Bay's open waters. Because land use plans and policies are promulgated by specific agencies, the regulatory setting discussion for this land use and planning discussion is organized by agency rather than by the specific law or regulation, as in other sections. All trailhead designation decisions and any potential construction proposed for trailheads on federal property will require compliance with NEPA as well as CEQA.

FEDERAL AGENCIES AND REGULATIONS

NATIONAL PARK SERVICE AND GOLDEN GATE NATIONAL RECREATION AREA

The National Park Service (NPS) has jurisdiction over several bayfront National Parks. At Golden Gate National Recreation Area (GGNRA), managers balance the preservation of significant historic resources and important natural areas with provision of recreation opportunities for 16 million visitors per year. The NPS Management Policies stipulate that park managers only allow uses that are “(1) appropriate to the purpose for which the park was established, and (2) can be sustained without causing unacceptable impacts to a park's resources or values. Recreational activities and other uses that would impair a park's resources, values, or purposes cannot be allowed.” (NPS 2001). NMSB launching and overnight camping are existing activities in the GGNRA. NMSB launching is also an existing activity in San Francisco Maritime National Historic Park, and Rosie the Riveter/World War II Home Front National Historical Park.

NPS manages one San Francisco GGNRA site: SF12, Crissy Field; and two Sausalito GGNRA sites: M1, Kirby Cove and M2, Horseshoe Cove. General Management strategies for the park can be found in *Management Policies 2006* (NPS 2006). The GGNRA *General Management Plan* (NPS 1980) is in the process of being updated, but is not anticipated to represent a significant change in direction of park management (pers. comm. Brian Aviles, January 10, 2008) with regard to access to these sites by NMSBs.

Management of SF12, Crissy Field, is described in the 1996 *Crissy Field Plan Environmental Assessment* (NPS 1996). Plans for Kirby Cove will be included in the updated *General Management Plan*, and public use is supported in the current plan. Plans for Horseshoe Cove are contained in the *Fort Baker Plan and Final Environmental Impact Statement* (NPS, 2000)

(which is currently being revised) and Crissy Field in the *Final General Management Plan Amendment: Creating a Park for the 21st Century, from Military Post to National Park, Presidio of San Francisco, Golden Gate National Recreation Area, California* (NPS 1994). NMSB use is consistent with these NPS land management plans.

Site CC15, Marina Bay Park (managed by the City of Richmond), is located in Rosie the Riveter/World War II Home Front National Historical Park, which is owned by NPS. The management plan for the park was finalized in July 2009. The plan supports public-private efforts to plan for and provide land/water access for recreational boating, including both day-use and overnight facilities (NPS 2009).

U.S. FISH AND WILDLIFE SERVICE/SAN FRANCISCO BAY REFUGE COMPLEX

In the Bay Area, the USFWS owns and manages National Wildlife Refuges (NWR) and Bay waters totaling 30,000 acres. The National Wildlife Refuge System Improvement Act of 1997 designates wildlife-dependent recreational uses involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation as “priority general public uses.” When these activities are compatible with species protection goals (as determined by USFWS), they are welcome on refuges and receive priority over other uses. Additionally, the law states, in part, that “compatible wildlife-dependent recreation is a legitimate and appropriate general public use of the System, directly related to the mission of the System and the purposes of many refuges, and which generally fosters refuge management and through which the American public can develop an appreciation for fish and wildlife...” NMSB access to Refuge waters and shorelines in the San Francisco Bay National Wildlife Refuge Complex is regulated by the Refuge managers.

USFWS manages areas proposed for three Backbone Sites in National Wildlife Refuges. Two of these (SM25, Corkscrew Slough Viewing Platform, Redwood City; and A24, Jarvis Landing, Newark) are part of Don Edwards San Francisco Bay National Wildlife Refuge, which encompasses land both north and south of the Dumbarton Bridge and around the shoreline of the South Bay (USFWS 2003). The Jarvis Landing site is co-managed with the salt producer, Cargill. Site A27, Coyote Hills, is on an Alameda County Flood Control District levee, outside of the Don Edwards National Wildlife Refuge. It is managed by the East Bay Regional Park District (EBRPD). An additional site is planned for the San Pablo Bay NWR at the southwest corner of the Cullinan Ranch site, immediately north of Highway 37, but due to the timing of the planning process, this site was not included in the WT Plan.

A Comprehensive Conservation Plan (CCP) is being prepared for the San Pablo Bay NWR and is expected to be finished in 2010. A CCP for Don Edwards NWR is expected to be finished in 2012. Designated land uses in the CCPs are expected to be compatible with possible designation of the USFWS owned or managed WT Backbone Sites (Winnie Chan, USFWS, pers. comm. January 22, 2008).

STATE AGENCIES AND REGULATIONS

CALIFORNIA DEPARTMENT OF PARKS AND RECREATION

As with other resource management agencies, State Parks has a dual mission to protect the State’s “most valued natural and cultural resources,” and offer “opportunities for high-quality

outdoor recreation” (State Parks 2004). The California State Parks System Plan (State Parks 2002b,c) outlines five core programs for the Park system: resource protection, education/interpretation, provision of facilities (including camping and restrooms) at parks, public safety, and recreation.

State Parks manages four Bay shoreline parks on which five Backbone Sites would be located: China Camp State Park, San Rafael (Backbone Sites M39, China Camp State Park and M40, Bull Head Flat); Angel Island State Park, Angel Island (M17); Candlestick Point State Recreation Area, San Francisco (SF1); and Eastshore State Park, Albany Beach (A1).

The China Camp General Plan (State Parks, 1979); Angel Island General Development Plan (State Parks, 1978); Angel Island State Park, General Development Plan, Expanded Tram Service Amendment, Preliminary (State Parks, 1996); Candlestick Point State Recreation Area General Plan (State Parks, 1978, amended 1987); and Eastshore State Park General Plan (State Parks 2002a) describe the plans for each of these four areas respectively and include policies that relate to wildlife habitat and water quality. Compliance of any specific WT site improvements with these plans needs to be assessed at the project level.

CALIFORNIA DEPARTMENT OF FISH AND GAME

DFG “maintains native fish, wildlife, plant species and natural communities for their intrinsic and ecological value and their benefits to people. This includes habitat protection and maintenance in a sufficient amount and quality to ensure the survival of all species and natural communities. The Department is also responsible for the diversified use of fish and wildlife including recreational, commercial, scientific and educational uses” (CDFG 2009c). DFG owns and/or manages seven wildlife areas, eight ecological reserves, five state marine parks and one state marine conservation area around the Bay. Wildlife areas are managed to protect and enhance habitat for wildlife species, and to provide the public with wildlife-related recreational uses such as hunting, fishing and wildlife observation (Blankinship 1999). Ecological reserves are designed to conserve areas for the protection of rare plants, animals and habitats, and to provide areas for education, scientific research and recreation where these activities do not have adverse effects on wildlife and habitats (Lewis 2001).

Inclusion of any WT launch sites within wildlife areas or ecological reserves is subject to the compatibility of NMSB activities with the management objectives for these areas. Existing state marine parks, marine reserves, and marine conservation areas were originally established as ecological reserves, but these reserves have been included in Marine Protected Areas (MPAs) as part of the California Marine Life Protection Act (CDFG 2006a). These non-terrestrial marine or estuarine areas are specially managed for natural, historic or cultural resource preservation. DFG has discretion to establish restrictions on certain recreation activities in these areas on a case-by-case basis.

One Backbone Site would be located in a DFG Ecological Reserve: A22, Eden Landing Ecological Reserve (Hayward). Eden Landing Ecological Reserve is governed by an existing management plan (RMI 1999). Planned launch site N7, Green Island in American Canyon is within the Green Island Unit of the Napa Sonoma Marshes Wildlife Area. Restoration is in progress in this area, and the site will be opened to the public after construction is completed.

CALIFORNIA STATE UNIVERSITY (CSU)

One proposed Backbone Site, So2 in Vallejo, is located on the grounds of the California Maritime Academy, one of the campuses of the California State University (CSU) system. There is no management plan for access site So2 because the access is informal, and the California Maritime Academy does not anticipate creating a plan. The site consists of an asphalt pathway that runs along the waterfront and was constructed as a permit condition of a BCDC permit (Roger Jaeckel, California Maritime Academy, pers. comm. December 1, 2009).

LOCAL AND REGIONAL AGENCIES AND REGULATIONS

SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION

BCDC's actions are governed by the *San Francisco Bay Plan*, adopted in 1968 and subsequently revised. The *Bay Plan* guides protection and use of San Francisco Bay and its shoreline. The shoreline is defined as being located at mean high tide line, except in marsh areas, where the shoreline is located at five feet above mean sea level. BCDC has jurisdiction over a 100-foot shoreline band that is the area that lies within 100 feet upland of the shoreline. The *Suisun Marsh Protection Plan* (BCDC 1976) covers parts of Solano County south of Suisun City and includes site So5, Belden's Landing. BCDC's objectives are:

- Objective 1: Protect the Bay as a great natural resource for the benefit of present and future generations.
- Objective 2: Develop the Bay and its shoreline to their highest potential with a minimum of Bay filling.

Bay Plan

Policies relevant to the construction of the WT can be found in several sections of the Bay Plan. The Bay Plan designates shoreline priority use areas. Priority uses include: Wildlife Refuge, Waterfront Park/Beach, Water-related Industry, Port, and Airport. Bay Plan Policies applicable to the various Priority Use Areas are identified on the Bay Plan maps.

Described below are relevant policies related to Recreation and Public Access excerpted from the Bay Plan (as amended through January 2008). Policies relating to Appearance, Design and Scenic Views are discussed in Section 3.6 Aesthetics; policies applying to Fish, Other Aquatic Organisms, and Wildlife, in Sections 3.7 – 3.9; and policies relating to Sea Level Rise are in Section 3.12, Hydrology and Water Quality.

Recreation

1. *Diverse and accessible water-oriented recreational facilities, such as marinas, launch ramps, beaches, and fishing piers should be provided to meet the needs of a growing and diversifying population, and should be well distributed around the Bay and improved...*
3. *Recreational facilities such as waterfront parks, trails, marinas, live-aboard boats, NMSB access, fishing piers, launching lanes, and beaches, should be encouraged and allowed by the Commission, provided that they are located, improved and managed consistent with the following standards:*
 - a. **General.** *Recreational facilities should:*
 - (1) *Be well distributed around the shores of the Bay... Any concentrations of facilities should be as close to major population centers as is feasible;*

(2) Not pre-empt land or water area needed for other priority uses, but efforts should be made to integrate recreation into such facilities to the extent that they are compatible;

(4) Be consistent with the public access policies that address wildlife compatibility and disturbance. In addition:

(5) Compatible public and commercial recreation facilities should be clustered to the extent feasible to permit joint use of ancillary facilities...

(6) Sites, features or facilities within designated waterfront parks that provide optimal conditions for specific water-orientated recreational uses should be preserved and, where appropriate, enhanced for those uses...

(7) Access to marinas, launch ramps, beaches, fishing piers, and other recreational facilities should be clearly posted with signs and easily available from parking reserved for the public or from public streets or trails...

b. *Marinas.*

(1) Marinas should be allowed at any suitable site on the Bay...At suitable sites, the Commission should encourage new marinas.

(2) Fill should be permitted for marina facilities that must be in or over the Bay...

(4) Marinas should include public amenities, such as viewing areas, restrooms, public mooring docks or floats and moorages for transient recreational boaters, NMSB launching facilities, public parking, substantial physical and visual access; and maintenance for all facilities.

e. *NMSBs.*

(1) Where practicable, access facilities for NMSBs should be incorporated into waterfront parks, marinas, launching ramps and beaches, especially near popular waterfront destinations.

(2) Access points should be located, improved and managed to avoid significant adverse affects on wildlife and their habitats, should not interfere with commercial navigation, or security and exclusion zones or pose a danger to recreational boaters from commercial shipping operations, and should provide for diverse, water-accessible overnight accommodations, including camping, where acceptable to park operations.

(3) Sufficient, convenient parking ...should be provided at sites improved for launching NMSBs. Where feasible overnight parking should be provided.

(4) Site improvements, such as landing and launching facilities, restrooms, rigging areas, equipment storage and concessions, and educational programs that address navigational safety, security, and wildlife compatibility and disturbance should be provided, consistent with the use of the site.

(5) Facilities for boating organizations that provide training and stewardship, operate concessions, provide storage or boathouses should be allowed in recreational facilities where appropriate.

(6) Design standards for NMSB launching access should be developed to guide the improvement of these facilities...

4. *To assure optimum use of the Bay for recreation, the following facilities should be encouraged in waterfront parks and wildlife refuges:*
 - a. ***In waterfront parks.***
 - (1) *Where possible, parks should provide some camping facilities accessible only by boat, and docking and picnic facilities for boaters.*
 - (4) *Public launching facilities for a variety of boats and other water-oriented recreational craft...should be provided in waterfront parks where feasible.*
 - (9) *In waterfront parks that serve as gateways to wildlife refuges, interpretative materials and programs that inform visitors about the wildlife and habitat values present in the park and wildlife refuges should be provided.*
7. *Because of the need to increase the recreational opportunities available to Bay Area residents, small amounts of Bay fill may be allowed...*
8. *Signs and other information regarding shipping lanes, ferry routes, U.S. Coast Guard rules for navigation...weather, tide, current and wind hazards, the location of habitat and wildlife areas that should be avoided, and safety guidelines for smaller recreational craft, should be provided at ...recreational watercraft use areas.*
9. *Ferry terminals may be allowed in waterfront park priority use areas and marinas and near fishing piers and launching lanes, provided the development and operations of the ferry facilities do not interfere with current or future park and recreational uses, and navigational safety can be assured...*

Public Access

2. *In addition to the public access to the Bay provided by waterfront parks, beaches, marinas and fishing piers, maximum feasible access to and along the waterfront ...should be provided in and through every new development in the Bay...*
3. *Public access to some natural areas should be provided to permit study and enjoyment of these areas. However some wildlife are sensitive to human intrusion. For this reasons, projects in such areas should be carefully evaluated in consultation with the appropriate agencies...*

Specific land use policies applicable to WT Backbone Sites would be addressed during review of any specific access improvements at the time such improvements are proposed.

Suisun Marsh Protection Plan

The Suisun Marsh Protection Plan (SMPP) was adopted in 1976 to preserve and restore:

- (1) a primary management area encompassing the 89,000 acres of tidal marsh, managed wetlands, adjacent grasslands, and waterways in Suisun Marsh over most of which BCDC now has jurisdiction; and
- (2) a secondary management area of approximately 22,500 acres of significant buffer lands (BCDC 1976).

The SMPP is intended to be a more specific application of the general, regional policies of the San Francisco Bay Plan and to supplement those policies where appropriate because of the unique characteristics of the Suisun Marsh. Solano County is responsible for preparing and administering a local protection program required by the SMPP, consistent with the specific guidelines set forth in the SMPP. BCDC is the land use permitting agency for major projects in

the primary management area, and acts as an appellate body with limited functions in the secondary management area. The primary management area consists of tidal marshes, managed wetlands, seasonal marshes and lowland grasslands and represents an area of critical importance to marsh wildlife. The secondary management area consists of upland grasslands and cultivated lands and is intended to act as a buffer area to insulate the habitats within the primary management area.

Backbone Site So5, Belden’s Landing, is located in Suisun Marsh and governed by the SMPP. The policies of both the Bay Plan and the SMPP would apply to this site. Belden’s Landing is a County Park at the boundary of the primary and secondary management areas. The SMPP allows for passive recreation compatible with marsh protection.

The SMPP has the following policies in the Environment section related to wetland and upland protection:

- The diversity of habitats in the Suisun Marsh and surrounding upland areas should be preserved and enhanced wherever possible to maintain the unique wildlife resource.
- The Marsh waterways, managed wetlands, tidal marshes, seasonal marshes, and lowland grasslands are critical habitats for marsh-related wildlife and are essential to the integrity of the Suisun Marsh. Therefore, these habitats deserve special protection.
- Existing uses should continue in the upland grasslands and cultivated areas surrounding the critical habitats of the Suisun Marsh in order to protect the Marsh and preserve valuable marsh-related wildlife habitats. Where feasible, the value of the upland grasslands and cultivated lands as habitat for marsh-related wildlife should be enhanced.

It also has two “Recreation and Access” policies relevant to So5:

- Agencies administering land acquired for public access and recreational use should be responsible for maintaining the areas and controlling their use. Signing on roads leading into the Marsh and maintained litter receptacles at major public use areas should be provided by the appropriate local or State agency to prevent littering and vandalism to public and private property.
- Recreational activities that could result in adverse impacts on the environmental or aesthetic qualities of the Suisun Marsh should not be permitted. Levels of use should also be monitored to insure that their intensity is compatible with other recreation activities and with protection of the Marsh environment. For example, boat speeds and excessive noise should be controlled and activities such as water skiing and naval training exercises should be kept at an acceptable level.

ASSOCIATION OF BAY AREA GOVERNMENTS (ABAG) BAY TRAIL

The San Francisco Bay Trail is a planned 500-mile network of bicycling and hiking trails around the Bay, of which approximately half has been completed. The Bay Trail Plan was adopted by ABAG in 1989 (ABAG 1989). More than 70 of the Backbone Sites are on or near the San Francisco Bay Trail. The WT Plan encourages links between the land and water trails. The Bay Trail Plan (and its overlap with WT access points) is described in Section 3.3, Recreation.

CITIES AND COUNTIES

Counties and cities around the Bay also control land uses (either directly or through county and city government agencies) of shoreline areas and wetlands as waterfront parks and open space. Local land use planning jurisdiction applies to lands not under state, federal, or tribal jurisdiction. Each city and county has a General Plan, which includes land use, conservation, and open space elements; and a zoning ordinance that controls development and land uses in areas under local jurisdiction (i.e., non-state, federal, or tribal lands). General Plan land use designations and zoning ordinances that implement those designations control and restrict land uses within local agency jurisdiction, and may preclude certain land uses, such as overnight camping. New developments or land use changes are reviewed by local agencies for compliance with their applicable General Plan and zoning regulations.

Recreational boating rules in Section 660 of the State Harbors and Navigation Code empower local governments to establish ordinances that regulate navigation in waters within their jurisdiction through time-of-day restrictions, speed zones, special-use areas, and sanitation and pollution controls.

SPECIAL DISTRICTS/AGENCIES

Some Backbone Sites are owned and managed by one entity, while others have more complex arrangements involving multiple entities, all whom play different roles in the management of the sites. Several representative land-owning or -managing districts and agencies are described below. During the trailhead designation process, all appropriate managing agencies will be contacted for involvement in the planning process.

San Francisco Bay Water Emergency Transportation Authority

WETA has adopted an Implementation and Operations Plan (WTA 2003), and a Final Transition Plan (WETA 2009). These plans are described in Section 3.4: Navigational Safety. New ferry terminals may be located in: Antioch, Berkeley/Albany, Hercules/Rodeo, Martinez, Mission Bay (San Francisco), South San Francisco, Redwood City, Richmond, and Treasure Island (San Francisco).

East Bay Regional Park District

The East Bay Regional Park District's (EBRPD) management priorities range from a focus on recreation to emphasizing habitat preservation, depending on the park resources. Land uses in EBRPD are described in *Master Plan 1997* (EBRPD, 1997) and an accompanying map (EBRPD, 2007). EBRPD manages 15 Backbone Site locations in Oakland, Alameda, San Leandro, Hayward, Fremont, Point Richmond, El Cerrito, Martinez, Pinole and Rodeo in the following regional parks: Middle Harbor Shoreline Park, Crown Memorial State Beach, Martin Luther King, Jr. Regional Shoreline, Coyote Hills Regional Park, Oyster Bay Regional Shoreline, Hayward Regional Shoreline, Point Isabel Regional Shoreline, Point Pinole Regional Shoreline, Miller/Knox Regional Shoreline, Carquinez Strait Regional Shoreline, Bay Point Wetlands and Lone Tree Point.

Midpeninsula Regional Open Space District

The Midpeninsula Regional Open Space District (MROSD) manages its preserves under a dual mission to preserve and protect natural resources and to provide low intensity recreation and environmental education opportunities (MROSD 2009). The District's goals are governed by the

Midpeninsula Open Space Resource Management Five-Year Strategic Plan (MROSD 2003). Backbone Site SM2 is located in Ravenswood Preserve, a shoreline preserve managed by MSROD. There is an ongoing series of *Use and Management Plan Amendments* (MROSD 1982-2006) that pertain to the management of Ravenswood.

Flood Control Districts

Alameda County Flood Control District owns the channel of Alameda Creek and the levee to the south on which site A27, Coyote Hills, is located. The levee and channel have been leased to the EBRPD for recreational use. As part of the plan for salt pond restoration, it is possible that the northern levee will be breached and access will only be available from the south (EDAW 2007).

Ports

One site, SM4 located at Redwood City Municipal Marina, is under the jurisdiction of the Port of Redwood City. Two sites, SF4, Islais Creek, and SF7, Pier 52 Boat Launch, are managed by the Port of San Francisco. Site A8, Middle Harbor Shoreline Park, is operated by EBRPD but owned by the Port of Oakland. Ports are public entities generally run by autonomous commissions appointed by the city government. In general, port lands are subject to city and county general plans and zoning ordinances.

3.13.5 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Impacts to land use planning are considered significant if they would:

- Conflict with an established plan by a regulatory or management agency (such as those listed above) with jurisdiction over a proposed WT site
- Conflict with the zoning or General Plan land use designation for the city or county in which the proposed site is located, or
- Result in an incompatibility with adjacent or nearby land uses

REGIONAL IMPACTS AND MITIGATION MEASURES

IMPACT LUP-1: CONFLICT WITH FEDERAL, STATE, OR LOCAL LAND USE PLANS AND POLICIES

Of the 112 Backbone Sites, 95 are existing launch or destination sites and 17 are planned. It is possible that a few of these sites have grown “organically” in response to user pressure and their use is not in accordance with all plans and policies of the land owners and managers. Such discrepancies would emerge during the trailhead designation process. The HOSs are already developed, but the non-HOS sites may require various additional amenities, including structures such as bathrooms and more parking.

The minimal improvements associated with HOSs would be unlikely to result in land use conflicts or conflicts with land use management plans and implementing regulations. Signage may be subject to local design review, depending on the size of signage and specifics of local zoning ordinances.

As each site is unique, and the extent/type/location of any proposed facility improvements at non-HOSs are unknown at this time, it is not possible or appropriate for this Programmatic EIR to assess the potential compliance of any such development with local plans and policies,

including HCPs. Such an assessment would be conducted as part of the trailhead designation process for each site.

The designation and use of a particular site as part of the WT may conflict with a management plan established by the federal, state, regional or local land use planning agencies. Consultation with applicable federal, state, and regional agencies was conducted during the planning stages of the WT, so such conflicts would be unlikely. Conflicts with local land use plans and policies also are possible, though unlikely.

WT Plan Strategy 4 requires that the WT “Coordinate plans for trailhead development, management and use to be consistent with existing policies, plans and priorities of land and resource managers at and around trail heads...This coordination should be done by launch site managers during site assessment and planning for trailhead designation.” This strategy, as implemented in the trailhead planning and designation process outlined in the WT Plan, would reduce conflicts between trailhead designation and applicable federal, state, regional, and local plans, policies, and strategies, to a **less than significant** level.

SITE-SPECIFIC IMPACTS AND MITIGATION MEASURES

IMPACT LUP-2: INCOMPATIBILITY WITH ADJACENT OR NEARBY LAND USES

Even if a WT site is compatible with existing federal, state, or local land use plans and policies, operation of specific WT sites could still be incompatible with adjacent or nearby land uses, sensitive biological resources, and/or navigational hazards. Potential land use conflicts resulting from nearby marina activities, ferry terminals, or shipping traffic, are addressed in Section 3.3 Recreation and Section 3.4 Navigation Safety. Incompatibilities with wildlife habitat and sensitive wildlife are discussed in Sections 3.7 – 3.9 (Biological Resources). New campgrounds or other significant shore-side facilities such as boat storage, instructional facilities, or cafes and restaurants may also result in noise, public service demands, or other incompatibilities with nearby land uses. However, as noted earlier, WT Strategy 4 requires consistency with existing plans, policies and priorities to ensure that WT sites are compatible with adjacent land uses. In addition, Strategy 3 requires that improvements at WT sites be consistent with site characteristics, to ensure that recreational uses are protected, navigational safety hazards are addressed, and biological resources are appropriately protected. Because all trailhead plans will be reviewed to assure compliance with the WT strategies, this impact would be **less than significant**.

3.14 TRANSPORTATION, CIRCULATION, AND PARKING

This section of the Draft EIR identifies potential transportation, circulation and parking impacts that could result from the WT. In general, these include the potential for increased traffic levels to local streets and intersections that provide access to proposed project trailheads, and potential increases in parking needs at trailhead locations.

3.14.1 INITIAL STUDY FINDINGS

Lack of adequate parking was identified as the one potentially significant impact associated with the transportation resource area. No conflicts with existing alternative transportation programs or plans or changes to air traffic patterns were identified, and other potential traffic impacts were determined to be less than significant. Due to CalTrans and Contra Costa County comments on the Notice of Preparation for the EIR, however, traffic impacts that were determined to be less than significant in the IS are analyzed in this EIR.

3.14.2 REGIONAL SETTING

Existing transportation, circulation and parking conditions in and around the existing and planned launch areas vary widely. In general, existing sites are sized to accommodate their existing use, with some instances of overflow occurring during peak use seasons and weekends. As all sites are located on the San Francisco Bay shoreline, they typically do not occur at locations where heavy traffic volumes and severe levels of peak hour congestion occur. (Most commute corridors do not front on San Francisco Bay.) Observations of existing conditions⁵¹ have also identified that the periods of peak roadway use do not coincide with the periods of peak project facility use. In the Bay Area, the peak period for transportation facilities typically occurs during the weekday morning peak commute hour (7 to 9 AM) and the weekday evening peak hour (4 to 6 PM). Roadway segments, intersections and transportation infrastructure are generally designed to serve traffic levels that prevail during these peak periods. Normally, traffic levels are substantially lower during other hours of the day and on weekends. During these non-peak periods, good levels of service and relatively low levels of congestion occur.

3.14.3 LOCAL SETTING

The project envisions the potential use of a number of existing access sites in and around San Francisco Bay, as well as the potential for the use of a number of new sites. Potential use of existing sites is proposed in the jurisdictions shown in the table below. In addition, the development of new access sites is anticipated in the following communities: Bay Point, Rodeo, Martinez, Richmond, Oakland, Hayward, San Jose, Redwood City, San Francisco and Corte Madera. The types and levels of activities, and the site-specific demand for parking from all activities potentially occurring at a given trailhead location relative to available parking varies greatly from location to location.

⁵¹ Observations by Bill Burton, DMJM Harris Engineering, 2008

Alameda	Martinez	Rodeo (unincorporated; part of Contra Costa County)
Albany	Mill Valley	San Francisco
American Canyon	Napa	San Francisco County
Benicia	Napa County	San Leandro
Berkeley	Newark	San Mateo
Brisbane	Novato	San Rafael
Burlingame	Oakland	Sausalito
Corte Madera	Palo Alto	Sonoma County
Emeryville	Petaluma	South San Francisco
Fairfield	Pinole	Suisun City
Foster City	Point Richmond (unincorporated, part of Contra Costa County)	Tiburon
Hayward	Redwood City	Vallejo
Larkspur	Redwood Shores	
Marin County	Richmond	

3.14.4 REGULATORY SETTING

FEDERAL REGULATIONS

There are no federal regulations that would affect traffic or parking at the local level.

STATE AGENCIES AND REGULATIONS

The California Department of Transportation (Caltrans) is responsible for conditions on all State Highways. Within the area of the project, the Caltrans District 4 Intergovernmental Review/California Environmental Quality Act (IGR/CEQA) Branch is responsible for the review of Traffic Impact Studies for projects affecting State Highways (e.g., studies prepared as part of CEQA reviews).

LOCAL AND REGIONAL AGENCIES AND REGULATIONS

As described above, the project would potentially affect conditions on local roadways within more than 50 different local jurisdictions. The regulatory setting within each local jurisdiction is unique, and each has its own general plan policies, plans and requirements with respect to transportation facilities within their area of influence. Cities and counties also establish parking requirements for many types of land uses in their zoning ordinances.

Each of the nine Bay Area counties has a designated Congestion Management Agency (CMA), responsible for the monitoring of traffic conditions on regionally specific facilities within their sphere of influence and development, and prioritization and funding of improvement projects for regionally significant improvements. County CMAs affected by the project include: Alameda (ACCMA), Contra Costa (CCTA), Marin (TAM), Napa (NCTPA), Santa Clara (VTA) San Francisco (SFCTA), San Mateo (SMCTA), Solano (STA), and Sonoma (SCTA). For those portions of the proposed project that may impact regionally significant transportation facilities, the guidelines of these agencies must be followed.

3.14.5 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The significance criteria from the checklist in the CEQA guidelines were chosen as the significance criteria for transportation, circulation, and parking. In general, the project would result in a significant adverse impact if it were to:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)
- Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)
- Result in inadequate emergency access, or
- Result in inadequate parking capacity

METHODOLOGY

Transportation, circulation and parking impacts were evaluated by identifying possible conflicts and impacts that could occur in association with the types of facilities that would be part of and/or constructed through the WT, and evaluating the likelihood that these types of conflicts would occur as a result of the implementation of the WT.

REGIONAL IMPACTS AND MITIGATION MEASURES

Potential impacts to traffic and parking and corresponding mitigation measures are site-specific. The regional increases in traffic and parking needs potentially associated with implementation of the WT are negligible and present no regional impact.

SITE-SPECIFIC IMPACTS AND MITIGATION MEASURES

IMPACT TPC-1: DEGRADATION IN LEVELS OF SERVICE ON ACCESS ROADWAYS

At the program level, it is not possible to precisely predict any specific changes (increases or decreases) in use levels by location. Growth driven by population growth and demographics, and potential shifts in site use in response to facility improvements, nearby site closures or restrictions, and similar factors, however, could lead to site-specific increases in use. Installation of signage at HOSs would not be expected to have the potential for increased traffic or parking impacts. Facility improvements at Backbone Sites could, however, potentially generate new traffic impacts in proportion to the level and kind of increased usage they attract. Neither the increased level of use nor the associated traffic increases can be predicted at the current programmatic level of review.

The generation of additional traffic at new trailheads or facility improvements that could attract substantial new use of the site could result in unacceptable degradations in Levels of Service on

roadways and intersections that provide access to the sites. This impact is considered **potentially significant but mitigable**.

MITIGATION MEASURE TPC-M1: UNDERTAKE TRAFFIC ASSESSMENT PRIOR TO DESIGNATION OF NEW OR ENHANCED WT SITES

During the trailhead designation process at sites including development of substantial WT-related improvements at an existing facility or for new access sites, an analysis of potential traffic impacts for the trailhead under consideration shall be conducted in accordance with the methodology and guidelines of the subject jurisdiction within which it is located. If roadways of regional influence are found to be adversely affected by increased traffic levels, the access to the proposed new facilities shall comply with the requirements of the local jurisdiction, applicable Congestion Management Agency, and/or Caltrans, as appropriate.

IMPACT TPC-2: INADEQUATE PARKING AT NEW OR IMPROVED WT TRAILHEADS

Parking demands at existing access facilities may change with increased usage of a trailhead location, for example, due to substantial new infrastructure or if other factors (e.g., closure or restrictions on use of another site) lead to increased use of a trailhead. Signage improvements at HOSs are not expected to result in significant increased use, and therefore would not result in significant parking impacts. New or substantially expanded access facilities could generate new parking need in proportion to the level of usage they attract. Implementation of Strategy 8 (Parking) calls for site planners to ensure that new trailhead or facility improvements at existing trailheads take parking needs into consideration. The strategy, however, focuses primarily on the needs of NMSB users, rather than a potential trailhead as a whole, and parking conflicts could still occur even if appropriate parking for NMSB use is available. This impact is considered **potentially significant but mitigable**.

MITIGATION MEASURE TPC-M2: UNDERTAKE PARKING STUDY PRIOR TO DEVELOPMENT OF NEW OR ENHANCED WT SITES

Strategy 8 shall be modified to require analysis to estimate the amount of use associated with a new trailhead or changes at an existing site proposed as a trailhead, and the parking demand likely to result from the changes or new trailhead. Parking shall be provided in accordance with the anticipated need and the jurisdiction in which the site lies. Trailhead Plans shall address the potential need for additional parking.

IMPACT TPC-3: INADEQUATE EMERGENCY VEHICLE ACCESS

Trailheads will require an appropriate level of emergency vehicle access to support the types and levels of NMSB activities that could occur there, as well as other uses. Trailhead designation and associated improvements could be proposed at some existing access sites with inadequate emergency vehicle access, or proposed new sites could be located in areas with inadequate emergency vehicle access. This impact is considered **potentially significant but mitigable**.

MITIGATION MEASURE TPC-M3: EVALUATE EMERGENCY VEHICLE ACCESS AT NEW WT SITES AND SITES WITH SUBSTANTIAL IMPROVEMENTS

The trailhead designation process for each new access site or development of substantial new infrastructure that could potentially substantially increase usage at an existing facility shall consider whether adequate emergency vehicle access is available. If applicable, this shall include

an evaluation of truck turning radii on access roadways and intersections to ensure that emergency vehicles will be able to access the facilities. Potential delays to emergency vehicle access due to railroad crossing blockages also should be taken into consideration.

IMPACT TPC-4: HAZARDS DUE TO UNSAFE ACCESS ROADWAYS

Some potential trailhead locations may lack safe vehicle access, or increased use at an existing location could lead to unsafe conditions. Unsafe conditions could include conflicts with other roadway movements or railroad crossings, inadequate roadway geometry for vehicles with trailers, or inadequate sight distances. This impact is considered **potentially significant but mitigable**.

MITIGATION MEASURE TPC-M4: EVALUATE PLANS FOR NEW WT SITES TO DETERMINE SAFETY FOR VEHICLE ACCESS

The trailhead designation process for each new trailhead site or existing facility with development of substantial new infrastructure that could potentially substantially increase usage shall include analysis to determine if safe vehicular access is available. This shall include an evaluation of the geometry on roadways that provide access to launch sites. If unsafe geometry is suspected, the evaluation shall include a further review of historical access records to determine if safety hazards exist, and develop appropriate mitigations, as necessary. All at-grade roadway/railroad crossings on access roadways shall be reviewed in detail to determine if they meet modern safety standards and California Public Utilities Commission requirements.

3.15 GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

3.15.1 INITIAL STUDY FINDINGS

Greenhouse Gas (GHG) emissions and climate change were not evaluated as a resource in the Initial Study, when it was developed in 2007. At that time, although GHG emissions and associated climate change were recognized as increasingly important concerns, there was no consensus that project impacts in these areas should be assessed as part of the CEQA process. In August 2007, Senate Bill 97 was enacted. That legislation specifically directed the Office of Planning and Research (OPR) to propose CEQA Guidelines related to assessment and mitigation of the effects of GHG emissions. However, as discussed in section 3.15.4 Regulatory Setting, below, it was not until early 2010 that OPR completed the process of preparation and adoption of revisions to the CEQA Guidelines to incorporate the evaluation of climate change effects. Likewise, it was only in 2007 that the California Attorney General’s Office filed the first of a number of subsequent lawsuits that have been based on a public entity’s failure to analyze under CEQA the increased GHG emissions that would result from a proposed project. These and additional legal developments since then (see section 3.15.4 Regulatory Setting, below) have made it clear that such an analysis must be included within CEQA environmental documentation. Accordingly, this section incorporates a discussion and evaluation of the GHG emissions associated with the WT project.

3.15.2 CLIMATE CHANGE BACKGROUND

Gases that trap heat in the atmosphere are referred to as greenhouse gases because they capture heat radiated from the sun as it is reflected back into the atmosphere, similar to a greenhouse. Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (SF₆). These six GHGs are known as the Kyoto Gases because they were identified as the six gases included in the Kyoto Protocol, the first international agreement regarding the reduction of GHG emissions. These six gases are also included in the California Global Warming Solutions Act of 2006⁵² (AB 32) and the CEQA Guidelines, both of which are described in Section 3.15.4 below. The accumulation of GHGs in the atmosphere has been implicated as a driving force for global climate change and the related impacts of climate change. To account for the differences in the warming effect of various GHGs, emissions of various gases are often expressed in units of CO₂ equivalents (CO₂e). This represents the amount of CO₂ that would have the same relative warming effect as the actual combination of GHGs emitted.

Definitions of climate change vary between and across regulatory authorities and the scientific community, but in general can be described as the changing of the earth’s climate caused by natural fluctuations and the impact of human activities that alter the composition of the global atmosphere. Global climate change is associated with long-term change in overall weather patterns such as temperature, wind patterns, precipitation levels, and the severity and frequency of storms. In global climate change, these shifts occur both regionally and around the globe. Both natural processes and human activities emit GHGs. It is extremely unlikely that global climate change of the past 50 years can be explained without the contribution from human

⁵² Assembly Bill No. 32; California Health and Safety Code, Division 25.5, Sections 38500, et seq.

activities (United Nations Intergovernmental Panel on Climate Change (IPCC) 2007). Some of the human activities that contribute to global climate change are: burning fossil fuels, deforestation, and emission of certain gases from industrial activities. According to Article 2 of the United Nations Framework Convention on Climate Change (UNFCCC), “Avoiding Dangerous Climate Change” means: “stabilization of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.” Dangerous climate change defined in the UNFCCC is based on several key indicators including the potential for severe degradation of coral reef systems, disintegration of the West Antarctic Ice Sheet, and shut down of the large-scale, salinity- and thermally-driven circulation of the oceans (UNFCCC 2009). The global atmospheric concentration of carbon dioxide has increased from a pre-industrial value of about 280 parts per million (ppm) to 379 ppm in 2005 (IPCC 2007a). “Avoiding dangerous climate change” is generally understood to be achieved by stabilizing global average temperatures between 2 and 2.4°C above pre-industrial levels.

In order to limit temperature increases to this level, ambient global CO₂ concentrations must stabilize between 350 and 400 ppm (IPCC 2007b). Mitigating or reducing GHG emissions is critical to slowing climate change.

3.15.3 REGIONAL SETTING

REGIONAL GREENHOUSE GAS EMISSIONS

In 2004, the most recent year for which data are available, GHG emissions in the State of California were about 493,600,000 metric tons of CO₂e (CalEPA, 2006). California GHG emissions for 2004 were generated from the following activities (CARB, 2010).

TABLE 3.15-1. CALIFORNIA 2004 EMISSIONS BREAKDOWN

Emission Source	Percentage of Statewide GHG Emissions (2004)
Agriculture, Forestry, and Other Land Use	5%
Electricity and Heat Production	25%
Fugitive Emissions from Fuels	1%
Industrial Processes and Product Use	6%
Manufacture of Solid Fuels and Other Energy Industries	3%
Manufacturing and Construction	4%
Other Emissions	10%
Petroleum Refining	6%
Transportation	38%
Waste	2%

REGIONAL CONSEQUENCES OF CLIMATE CHANGE

Some of the impacts caused by climate change in California could include longer growing seasons, migration of some plant and animal species to higher latitudes, a reduction in the annual

snowpack in the Sierra Nevada Mountains, which may affect drinking water availability throughout California, and higher sea levels that could result in coastal flooding.

3.15.4 LOCAL SETTING

LOCAL GREENHOUSE GAS EMISSIONS

A GHG emissions inventory is available for the San Francisco Bay Area Region (Bay Area Air Quality Management District, 2010). In 2007, 95,800,000 metric tons of CO₂e were attributable to the San Francisco Bay Area (88,700,000 metric tons CO₂e were emitted within the Bay Area Air District and 7,100,000 metric tons CO₂e were indirect emissions from imported electricity). A summary of GHG emissions in the Bay Area by sector is provided in Table 3.15-2 below.

TABLE 3.15-2. BAY AREA 2007 EMISSIONS BREAKDOWN

Emission Source	Percentage of Regional GHG Emissions (2007)	CO₂e (Million Metric Tons/Year)
Industrial/Commercial	36.4%	34.86
Residential Fuel Usage	7.12%	6.82
Electricity/Co-Generation	15.87%	15.2
Off-Road Equipment	3.05%	2.92
Transportation	36.41%	34.87
Agriculture/Farming	1.16%	1.11
Total	100%	95.8

LOCAL CONSEQUENCES OF CLIMATE CHANGE: SEA LEVEL RISE

Sea level rise is the most significant consequence of GHG emissions within the project area. BCDC has recently completed a broad and thorough analysis of the effects of anticipated climate change within the San Francisco Bay: BCDC, *Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline*, April 7, 2009 (“BCDC Climate Change Report”). The information in this subsection is derived primarily from that source.

The BCDC Climate Change Report uses two sea level rise estimates for its analysis: a 16-inch (40 cm) sea level rise by mid-century and a 55-inch rise in sea level by the end of the century. Although the State of California is still in the process of formulating statewide policy direction for adapting to sea level rise, these estimates are generally consistent with other state planning efforts.

Sea level rise will have numerous consequences in the Bay Area. An estimated 270,000 people in the Bay Area will be at risk of flooding by the end of the century, which is 98 percent more than are currently at risk from flooding. The economic value of Bay Area shoreline development estimated to be at risk by the end of the century is \$62 billion. In those areas where lives and property are not directly vulnerable, the secondary and cumulative impacts of sea level rise will affect public health, economic security, and quality of life.

Particularly relevant to the WT sites is the BCDC Climate Change Report’s conclusion that there are 23,000 acres of waterfront parks within San Francisco Bay, of which 14 percent would be

vulnerable by mid-century and 18 percent would be vulnerable by the end of the century. In addition, 57 percent of the public access required by BCDC would be vulnerable by mid-century and 87 percent would be vulnerable by the end of the century. The decline of waterfront recreational opportunities will impact the quality of life in the Bay Area.

3.15.5 REGULATORY SETTING

FEDERAL REGULATIONS

On April 10, 2009, the EPA published a Draft Rule for Mandatory Reporting of GHG Emissions in the *Federal Register*. In general, this rule will require the following entities to annually track and report GHG emissions: suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more of GHG emissions per year. The Final Rule was signed by the EPA Administrator on September 30, 2009 and published in the *Federal Register* on October 30, 2009. The Rule became effective on December 29, 2009. Due to the high emission threshold for reporting, the Federal Rule will not affect the WT project or the SCC.

In June 2009, the U.S. House of Representatives passed HR 2454, a bill pertaining to climate change that would regulate GHG emissions through a “cap and trade” mechanism. However, action in the near future by the Senate on a similar proposed “cap and trade” bill now appears unlikely.

On December 7, 2009, the U.S. Environmental Protection Agency Administrator signed two distinct findings regarding GHGs under section 202(a) of the Clean Air Act:

- An “endangerment finding” that current and projected concentrations of GHGs in the atmosphere threaten the public health and welfare of current and future generations.
- A “cause or contribute finding” that the combined GHG emissions from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

These findings do not themselves impose any requirements. However, this action is a prerequisite to any regulation by EPA of GHG emissions, including the new fuel economy standards (described below).

On April 1, 2010, the EPA and the Department of Transportation’s National Highway Safety Administration announced a joint final rule establishing a new National Program to reduce GHG emissions from new cars and light trucks sold in the U.S. The standards that make up this National Program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. They require these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon (MPG). Together, these standards will cut greenhouse gas emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016).

STATE AGENCIES AND REGULATIONS

EXECUTIVE ORDER S-3-05

Executive Order S-3-05, signed by Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. To combat those concerns, the Executive Order established total GHG emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006

In 2006, California adopted AB 32. As described in Section 3.2, AB 32 establishes regulatory, reporting, voluntary, and market mechanisms to achieve quantifiable reductions in GHG emissions to meet the statewide goal of reducing CO₂e emissions to 1990 levels by 2020. To accomplish this goal, AB 32 directed the California Air Resources Board (CARB) to design and implement emission limits, regulations, and other measures. AB 32 will also require mandatory reporting and verification of GHG emissions for some emitters, as well as development of a statewide Scoping Plan for reaching emission reductions. Similar to the federal mandatory reporting rule for GHG emissions, mandatory reporting of GHGs in California will not affect the WT project or the SCC due to high emission thresholds for reporting.⁵³

CARB approved the 2020 emission limit of 427 million metric tons of CO₂e in December 2007. The 2020 target of 427 million metric tons of CO₂e requires the reduction of 169 million metric tons of CO₂e. The total reduction for the recommended measures is 174 million metric tons/year of CO₂e. CARB's Climate Change Proposed Scoping Plan was approved on December 11, 2008 and includes the following key elements:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation.

The measures in the Proposed Scoping Plan will be in place by 2012. The Climate Change Proposed Scoping Plan also includes recommended measures to reduce GHG emissions from key sources and activities while improving public health, promoting a cleaner environment, preserving our natural resources, and ensuring that the impacts of the reductions are equitable

⁵³ The emission threshold in California is 25,000 metric tons of CO₂/year for most emitters. (Some emitters, such as cement plants, are required to report, regardless of their annual emissions.)

and do not disproportionately impact low-income and minority communities. The measures also put the state on a path to meet the long term 2050 goal of reducing California’s GHG emissions to 80 percent below 1990 levels.

Some of the measures included in the Scoping Plan will affect the WT improvements and will address any potential associated increases in GHG emissions. For example, clean car standards and goods movement measures would likely apply to vehicles in use for the WT project and emissions would be reduced once those measures are implemented.

One of the most recent measures to be enacted in California is development of a mandatory Green Building Standards Code. This Code was the first of its kind in the nation, and was adopted by the California Building Standards Commission on January 12, 2010. The Code takes effect on January 1, 2011 and includes requirements for energy efficiency, water use reduction, and diversion of construction and demolition waste for recycling, among other requirements.

SENATE BILL 97 AND CEQA GHG GUIDELINES

As described in Section 3.2, in August 2007, California adopted Senate Bill 97⁵⁴ (SB 97). Under this legislation, on December 30, 2009, the Resources Agency adopted amendments to the CEQA Guidelines, which describe the process and methodology for assessing the effects of GHG emissions under CEQA. The Resources Agency then transmitted the adopted amendments and the entire rulemaking file to the Office of Administrative Law (OAL) on December 31, 2009. The final amendments took effect on March 18, 2010. The Office of Planning and Research (OPR) and the Resources Agency are also required to periodically review the guidelines to incorporate new information or criteria adopted by CARB pursuant to the Global Warming Solutions Act (criteria are due by 2012).

The amended Guidelines do not establish any bright-line threshold for determining significance of GHG emissions, whether as an individual effect or a cumulative one. Likewise, CARB has not yet established any specific criteria or thresholds.

The CEQA GHG Guidelines do provide general guidance on determining the significance of impacts from GHG emissions. The Guidelines state that the lead agency “should make a good faith effort, based to the extent possible on scientific and factual data, to describe, calculate, or estimate the amount of GHG emissions resulting from a project.” The lead agency should also consider the following factors, among others, when assessing the significance of impacts from GHG emissions on the environment:

1. The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;
2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project;

⁵⁴ Chapter 185, Statutes 2007

3. The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of GHG emissions. (Section 15064.4)

LOCAL AND REGIONAL AGENCIES AND REGULATIONS

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

The Bay Area Air Quality Management District (BAAQMD) is the public agency entrusted with regulating sources of air pollution in the nine counties that surround San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma counties. In this capacity, BAAQMD is directly engaged in the statewide effort to reduce GHG emissions.

On December 7, 2009, BAAQMD published a “California Environmental Quality Act Guidelines Update: Proposed Thresholds of Significance” (BAAQMD 2009). On June 2, 2010, the BAAQMD Board of Directors unanimously adopted these guidelines. The updated guidelines include CEQA thresholds of significance for GHG emissions, all of which are effective June 2, 2010. Minor revisions that reflect clarifications and typographical errors only were released on June 17, 2010 (BAAQMD 2010), and do not affect the thresholds. The BAAQMD GHG thresholds are shown in Table 3.15-3.

TABLE 3.15-3. BAAQMD GHG THRESHOLDS OF SIGNIFICANCE

Project Type	Construction-Related Emissions	Operation-Related Emissions
Projects other than Stationary Sources	None	Compliance with Qualified Climate Action Plan OR 1,100 metric tons of CO2e/yr OR 4.6 metric tons CO2e/service population/yr* (residents + employees)
Stationary Sources	None	10,000 MT of CO2e/yr
Plans	None	Compliance with Qualified Climate Action Plan (or similar criteria included in a General Plan) OR 6.6 metric tons CO2e/service population/yr (residents + employees)*

* BAAQMD staff notes that the efficiency-based thresholds should be applied to individual projects with caution. As explained in the Thresholds of Significance Report, lead agencies may determine that the efficiency-based GHG thresholds for individual land use projects may not be appropriate for very large projects. If there is a fair argument that the project’s emissions on a mass level will have a cumulatively considerable impact on the region’s GHG emissions, the insignificance presumption afforded to a project that meets an efficiency-based GHG threshold would be overcome.

The WT will not create any stationary sources, but is expected to generate mobile sources of GHG emissions. Also, the WT is not a general plan or other long-range plan, but is a specific project. The category “Projects other than Stationary Sources” is intended to apply to land use development projects including residential, commercial, industrial, and public land uses and facilities. Thus, the category “Projects other than Stationary Sources” is the applicable project type with which to compare WT Project.

Also, the WT will not include a “service population,” which normally includes both residents and employees, since not all residents will use WT facilities. (Usually, the concept of a service population is applied to land use and major development projects, such as new residential developments or new commercial or retail developments.) For these reasons, the threshold of 1,100 metric tons CO₂e/year is the most appropriate point of comparison for the WT project. As indicated in the BAAQMD CEQA Air Quality Guidelines (2010), the GHG thresholds are intended to provide interim threshold levels during the implementation of the AB 32 Scoping Plan and until CARB adopts a recommended threshold. As stated in Appendix D of the Air Quality Guidelines:

“GHG CEQA significance thresholds recommended herein are intended to serve as interim levels during the implementation of the AB 32 Scoping Plan and SB 375, which will occur over time. Until AB 32 has been fully implemented in terms of adopted regulations, incentives, and programs and until SB 375 required plans have been fully adopted, or the California Air Resources Board (ARB) adopts a recommended threshold, the BAAQMD recommends that local agencies in the Bay Area apply the GHG thresholds recommended herein.”

The fundamental purpose of the BAAQMD GHG thresholds is to provide a temporary standard for local and other agencies to use to determine the significance of GHG emissions so that new local development and other projects in the Bay Area Air Basin do not result in a cumulatively considerable amount of GHG emissions and a substantial conflict with the State’s ability to meet the goals of AB 32.

LOCAL REGULATIONS

A multitude of local jurisdictions on the shoreline of the San Francisco Bay have adopted “green building codes,” the purpose of which is to encourage or to require building practices that will have the effect, among others, of reducing or avoiding GHG emissions related to construction and the future use of buildings. Jurisdictions which have adopted green building codes and in which there are potential WT sites include Albany, Hayward, Marin County, Napa, Novato, San Francisco and San Rafael. These codes will be applicable to any construction related to the improvement of WT sites that occurs in jurisdictions in which such codes have been adopted. Numerous local cities and counties have also developed or are in the process of developing and adopting climate action plans (CAPs). Some of these plans address only the GHG emissions directly controlled by the city or county operations, while others include strategies and policies for reducing community-wide GHG emissions. The following cities and counties have adopted community-wide CAPs: City of Alameda, City of Benicia, City of Berkeley, City of San Rafael, City and County of San Francisco, Marin County, and Sonoma County.

A summary of some CAPs and the included local actions that may be relevant to WT sites is provided in Appendix F. Future CEQA analysis will consider development of each WT site and will consider the GHG emissions from each site in the context of the appropriate local county or city Climate Action Plan.

3.15.6 IMPACTS AND BEST PERFORMANCE STANDARDS

SIGNIFICANCE CRITERIA

As noted in the discussion of Senate Bill 97 and the GHG CEQA Guidelines above, under the revised CEQA Guidelines, two essential questions must be answered in assessing the environmental effect of a project's GHG emissions:

- Does the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?
- Does the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs?

As discussed previously, at this time there are no adopted Statewide guidelines for GHG emission impacts, although this will be addressed through the requirements of SB 97. BAAQMD has adopted guidelines applicable to the Bay Area. However, although these guideline are persuasive, having been adopted by the agency responsible for regulating air resources in the Bay Area, the guidelines have not been adopted by the Conservancy. Consequently, for the purposes of this EIR, the project would be considered to have a significant impact if:

- Implementation of the project would conflict with the AB 32 State goals for reducing GHG emissions.

METHODOLOGY

As recently amended, the CEQA Guidelines prescribe the process and methodology for determining and evaluating the significance of GHG emissions that are associated with a project. Section 15064.4 calls for the lead agency to make “a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of GHG emissions resulting from a project.” In doing so, the agency may either:

- Select a model or methodology to quantify GHG emissions resulting from the project, so long as it explains the limitations of the particular model or methodology selected for use, or
- Rely on a qualitative analysis or performance-based standards.

A methodology was developed specific to the WT project to quantify emissions (described in Appendix G). The resulting quantitative analysis of GHG emissions attributable to the WT project is provided below.

- Section 15064 also requires a lead agency to consider the factors described in detail above under “Senate Bill 97 and CEQA GHG Guidelines” when assessing the significance of impacts from GHG emissions on the environment.

Each of these factors is considered below. As noted above, the threshold of significance used in this EIR is whether the implementation of the project would conflict with the AB 32 State goals for reducing GHG emissions. In this regard, BAAQMD's adopted thresholds of significance and its rationale are an important source of pertinent information and guidance.

The Guidelines specifically require that an EIR discuss any inconsistencies between the proposed project and any state, local or regional plans for the reduction of GHG emissions. Section 15126.4 of the Guidelines also provides direction on development of appropriate feasible measures to mitigate or avoid any potentially significant GHG effects. Feasible mitigation measures as defined by the CEQA Guidelines may include:

- Measures in an existing, applicable plan or mitigation program for the reduction of emissions.
- Reductions in emissions resulting from a project through implementation of project features, project design, or other measures, such as those described in Appendix F of the Guidelines.
- Off-site measures, including offsets that are not otherwise required, to mitigate a project's emissions.'
- Measures that sequester greenhouse gases.
- In the case of the adoption of a plan, such as a general plan, long range development plan, or plans for the reduction of greenhouse gas emissions, mitigation may include the identification of specific measures that may be implemented on a project-by-project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.

IMPACTS AND MITIGATION MEASURES

IMPACT GHG-1: INCREASE IN GREENHOUSE GAS EMISSIONS ATTRIBUTABLE TO THE IMPLEMENTATION OF THE WATER TRAIL

This discussion first presents a summary of the estimated increases and decreases in GHG emissions potentially associated with implementation of the WT, and then evaluates the significance of the estimated change in emissions.

Quantification of GHG Emissions

The methodology presented in Appendix G was used to quantify 1) GHG emissions from SCC-funded WT construction activities and from ongoing operation of WT sites, and 2) operational emissions of additional vehicle trips to and from WT sites in response to SCC-funded WT-related media and outreach and trailhead facility improvements.

In addition, emissions are divided into Scope 1, Scope 2, and Scope 3 categories, as defined by *The GHG Protocol: A Corporate Accounting and Reporting Standard, Revised Version* from the World Business Council on Sustainable Development (WBCSD) and the World Resources Institute (WRI) (WBCSD and WRI, 2004). Scope 1 emissions are defined as direct GHG emissions from sources that are owned or controlled by the entity, such as emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc. Scope 2 emissions are from the generation of purchased electricity. Scope 3 emissions are typically considered optional for reporting, and include all other indirect emissions. Scope 3 emissions are defined as a

consequence of the activities of the entity, but occur from sources not owned or controlled by the entity.

Most GHG inventory protocols, such as the California Climate Action Registry *General Reporting Protocol* require reporting of Scope 1 and 2 emissions. This project is expected to generate Scope 1 emissions from construction activities, but no or only extremely minor Scope 2 emissions, since very few of the facilities that will be constructed at Water Trail sites are likely to use electricity. Scope 2 emissions, if any, attributable to the WT were not quantified because the precise nature of any facilities constructed solely due to the implementation of the WT cannot be determined, and the amount of electricity used by any such facilities also cannot be determined. Scope 3 emissions from additional travel to and from WT sites are included in this analysis because these emissions were quantifiable, and because these emissions are expected to be a large portion of the emissions generated by the WT project. Additional Scope 3 emissions (such as “upstream” emissions from harvesting and processing lumber) are not included because they are extremely difficult to quantify. In order to estimate these emissions, data from suppliers of products are needed, as well as data on the actual products that will be purchased for each construction project.

A summary of GHG emissions attributable to the WT is provided in Table 3.15-4. The methodology for quantifying these emissions is provided in Appendix G. The potential magnitude and significance of changes in GHG emissions potentially attributable to the implementation of the WT are discussed below.

TABLE 3.15-4. SUMMARY OF GHG EMISSIONS ATTRIBUTABLE TO THE WATER TRAIL

Source of Emissions			GHG Emissions in Metric Tons of Carbon Dioxide Equivalents (metric tons CO ₂ e)	
			Total Emissions	Annual Emissions
Scope 1	Construction Emissions	Mobile Emissions from Construction of New Facilities (10-year time frame)	465	46.5/year
Scope 3	Operational Emissions	Mobile Emissions from Additional Traffic due to WT Implementation (20-year time frame)	2,482	124/year
Totals:			2,947 (over 20-year time frame)	170.5/year

Emission Reductions

A small number of new trips to WT sites are likely to replace current trips that are taken by non-motorized boat owners in the Bay Area to destinations outside of the region. Unpublished raw data (n=52) from survey respondents in the Bay Area (personal communication, Wendy Pratt, March 2010), collected for *Non-Motorized Boating in California* (Cal Boating 2009), indicate that about 70% of non-motorized boat owners in the San Francisco Bay Area travel to other destinations outside of the region to participate in non-motorized boating. (“Local” is defined in this methodology, based on these survey results, as taking 1.5 hour or less, one-way, to reach the destination.) In comparison, 78% of non-motorized boaters in Oregon reported that their most frequent destination is local (Carter, 2004), and only 22% travel to non-local destinations on a regular basis. (“Local” is defined in this methodology from survey results as being 75 miles or less, one-way, from their starting location.) Thus, it appears that non-motorized boat owners in the Bay Area tend to travel farther to participate in non-motorized boating than owners in at least one other location.

Emission reductions would occur from replacing longer trips to a non-local destination with a shorter local trip to the San Francisco Bay, once the WT project is implemented. The methodology for calculating the emission reductions is included in Appendix G. A summary of GHG emission reductions that would result from implementation of the Water Trail is provided in Table 3.15-5.

TABLE 3.15-5. SUMMARY OF GHG EMISSION REDUCTIONS EXPECTED FROM IMPLEMENTATION OF THE WATER TRAIL PROJECT

Source of Emissions			GHG Emission Reductions in Metric Tons of Carbon Dioxide Equivalents (metric tons CO ₂ e)	
			Total Emission Reductions	Annual Emission Reductions
Scope 3	Operational Emissions	Mobile Emission Reductions from Replacing Non-Local Trips with Local Trips to the San Francisco Bay (20-year time frame)	1,046	52/year

Significance of GHG Emission Changes

The expected emissions rate attributable to the project is 171 metric tons CO₂e/year. When expected emission reductions are included, the annual emissions rate is 119 metric tons CO₂e/year.

The WT Project will be implemented throughout the Bay Area, and thus the project is not subject to meeting the requirements of any city or county Climate Action Plan (although the

requirements of a given plan may apply to construction of WT facilities within a city or county). Currently, there is not a regional Bay Area Climate Action Plan. In the future, CARB will be developing regional targets for reduction of GHG emissions from the automobile and light truck sectors in compliance with Senate Bill 375;⁵⁵ however, these targets have not yet been developed, and these targets are tied to land use planning strategies and housing plans, and will not be highly relevant for the WT Project. The WT Project will be in compliance with the requirements of AB 32, which, as noted above, will include numerous measures in the coming years to reduce GHG emissions, including the forthcoming California Green Building Standards Code, which becomes effective on January 1, 2011.

As discussed in Sections 3.15.3 and 3.15.4 above, regional GHG emissions in the Bay Area are 95.8 million metric tons per year (based on 2007 data) and GHG emissions in the State of California are 493.6 million metric tons per year (based on 2004 data). Thus, emissions over the next 20 years from implementation of the WT are expected to be only 0.0002 % of the annual emissions in the Bay Area, and 0.00003% of annual emissions in California.

As with other individual projects, the specific emissions from this project would not be expected to individually have an impact on Global Climate Change.⁵⁶ Recent guidance indicates that GHG-related impacts are considered to be exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective.⁵⁷ Accordingly, the project's cumulative impacts are evaluated in Chapter 4 (Cumulative Impacts and Other CEQA Sections) rather than here. The potential impacts of the WT project alone are **less than significant**.

⁵⁵ Senate Bill 375 also requires each metropolitan planning organization (MPO) in California to prepare a "sustainable communities strategy" to reduce the amount of vehicle miles traveled (VMT) in their respective regions and demonstrate the ability for the region to attain CARB's targets.

⁵⁶ Association of Environmental Professionals (AEP), *Alternative Approaches to Analyzing GHG Emissions and Global Climate Change in CEQA Documents*, 2007.

⁵⁷ California Air Pollution Control Officers Association (CAPCOA), *CEQA and Climate Change: Evaluating and Addressing GHG Emissions from Projects Subject to the California Environmental Quality Act*, 2008.

4 CUMULATIVE IMPACTS AND OTHER CEQA SECTIONS

4.0 CUMULATIVE IMPACTS AND OTHER CEQA SECTIONS

“*Cumulative impacts*” refers to “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.” (CEQA Guidelines, Section 15355). This section of the EIR focuses only on potential impacts due to implementation of the Water Trail Plan in combination with other reasonably foreseeable projects and general (non-WT-induced) growth of boating on the Bay. Potential regional impacts of the WT (analysis of the designation or use of many WT sites in combination) were discussed in Chapter 3.

CEQA also requires evaluation of potential growth-inducing impacts of the project, discussion of significant unavoidable effects, if any, and the irretrievable/irreversible commitments of any environmental resources. These issues are discussed following the evaluation of potential cumulative impacts.

4.1 Cumulative Impacts

CEQA Guidelines Section 15130(b)(1) specifies that cumulative impacts analyses should use either a list of past, present, and probable future project that may have impacts overlapping those of the proposed project, or a summary of projections contained in an adopted document. As detailed below, this EIR uses a hybrid approach that includes: 1) Baywide projects that may have impacts overlapping those of the project, and 2) projections of increased numbers of motorized and other (typically) larger non-motorized boats on the Bay that are not included in the definition of NMSBs used in the Water Trail Plan.

Baywide projects that may have cumulative effects with the implementation of the WT Plan include the Bay Trail Plan, the Ferry Plan developed by the Water Emergency Transportation Authority, and various wetland restoration projects. There are two existing projections from the California State Department of Boating and Waterways (Cal Boating 2009) regarding potential increases in boating on the Bay:

- Projection 1: Increased use of the Bay by NMSBs absent the implementation of the WT (i.e., non-WT-induced growth)
- Projection 2: Increased use of the Bay by other (motorized and large non-motorized) boats (also non-WT-induced).

In addition, with respect to the evaluation of the cumulative effects of implementation of the WT Plan as it relates to greenhouse gas (GHG) emissions, this EIR uses the estimate of total GHG emissions in the Bay Area Air Basin provided in the June 2010, Bay Area Air Quality Management District (BAAQMD) “CEQA Air Quality Guidelines.”

4.1.1 CUMULATIVE PROJECTS CONSIDERED IN THIS EIR

In addition to the projections and projects discussed below, numerous individual projects that affect the Bay margins (ranging from port improvement projects to commercial and residential developments to parks and recreational facilities) are likely to be implemented over the life of the WT Plan. Although those projects may have locally overlapping impacts with those of individual Backbone Sites (such as local traffic and parking impacts), they do not have the

potential for Baywide cumulative impacts when combined with the WT Plan. These locally overlapping impacts would be addressed in the CEQA reviews for specific Backbone Site improvements (i.e., Trailhead Plans).

PROJECTION 1: PROJECTED GROWTH IN NMSB USE OF THE BAY (WITHOUT THE WT PLAN)

As described in Chapter 2, Project Description, an extensive survey of NMSB use in California was performed by the California Department of Boating and Waterways in 2006 – 2007 (Cal Boating 2009). The survey states that in 2006, there were an estimated 372,233 individuals in the Bay Area participating in NMSB use of all kinds and that the total number of estimated NMSB participant-days associated with this region in 2006 was 7.4 million. As also explained in Chapter 2, the estimated number of participants days includes use of inflatables, which are generally not used on the Bay; subtracting out the percentage of inflatables results in an estimated 5.3 million participant-days. Actual use of NMSBs within the Bay is likely to be considerably lower, as less than half of the respondents in the survey listed San Francisco Bay as their most used waterway; NMSBs are also used on inland lakes and rivers, and other areas such as Tomales Bay.

Cal Boating projects that NMSB use throughout California will increase by an average 3.84% per year from 2006 to 2010 (see Chapter 2, Project Description for details, including definitions of low, medium, and high estimates). This “medium estimate” of 3.84% is based on the annual compound rate of growth in NMSB use between 2002 and 2006 (Cal Boating 2009) and calculates to be 2,228,077 participants statewide in the year 2010 (a total increase of 16.27% between 2006 and 2010). The low and high growth rate estimates would result in 2,063,801 (total increase of 7.70%) and 2,274,395 (total increase of 18.68%) participants, respectively.

The projected growth estimates provided in the Cal Boating survey are for the State of California as a whole with some regionally specific data about numbers of privately owned NMSBs, numbers of boating participants, and numbers of boating participation days. The Cal Boating survey does not provide specific projected growth figures for the San Francisco Bay Area, nor are there other reliable sources that could provide specific estimates.

PROJECTION 2: PROJECTED GROWTH IN RECREATIONAL BOATING USE OF THE BAY (WITHOUT THE WT PLAN)

Growth in recreational boating absent the WT will be comprised of growth in motorized boating and non-motorized boating. As discussed in Chapter 2, based on the two most recent applicable Cal Boating reports (Cal Boating 2002, Cal Boating 2009), motorized recreational boating is expected to increase by 1.4% to 2.5% per year, and non-motorized boating is expected to increase by 3.84% per year. The long-term growth in either motorized or non-motorized boating cannot be predicted with certainty; as also discussed in Chapter 2, growth in non-motorized boating is dependent on demographics and population growth, among other factors, and there are also trends in the use of specific types of NMSBs.

The total usage of motorized and non-motorized boats in the San Francisco Bay Area is substantial. There were an estimated 158,223 registered (predominantly motorized) recreational boats in the San Francisco Bay Area as of 2000, used an average of 25 days per year (Cal Boating 2002), for a total of approximately 3,960,000 participant-days in 2000. The estimated

annual growth rate of 1.4% to 2.5% corresponds to an additional approximately 2,200 to 4,000 motorized boats per year. Thus, growth in motorized boating would contribute an additional 527,000 to 984,000 days of motorized boat use by 2010, for a total of approximately 4,730,000 to 4,980,000 participant-days. NMSB use is expected to grow at a greater rate than motorized boat use, as discussed in Chapter 2, and the medium estimate is 3.84% per year (Cal Boating 2009). As described in detail in Chapter 2, NMSB use is expected to increase from approximately 5.3 million participant-days in 2006 to approximately 6.2 million participant days in 2010. Thus, the combined growth in motorized and non-motorized boating is expected to result in a total of up to 11.2 million participant-days by 2010, absent the WT.

The 2002 and 2009 Cal Boating studies also identified facilities needs for the Bay region, including the need for better waste pump-out facilities, additional boat slips, dock repairs, dredging, restrooms, storage, signage, gas pumps, parking, rigging areas, security and launching capacity.

SPECIFIC PROJECTS

BAY TRAIL PLAN (ASSOCIATION OF BAY AREA GOVERNMENTS)

The San Francisco Bay Trail is a planned bicycle and pedestrian trail system around the perimeter of San Francisco and San Pablo Bays, approximately 500 miles in length. Approximately 300 miles have been completed and are in use by the public. The Association of Bay Area Governments coordinates the completion of this regional trail through 47 cities and nine counties. Table 3.3.3-1 shows WT Backbone Sites that are adjacent to existing segments of Bay Trail spine. There is potential overlap between the two projects in the possibilities to share facilities such as restrooms and parking, construction efforts, and in increasing the overall number of visitors to these locations.

FERRY PLAN (SAN FRANCISCO BAY WATER EMERGENCY TRANSPORTATION AUTHORITY)

The Water Emergency Transportation Authority (formerly Water Transportation Authority) has adopted an Implementation and Operations Plan (WTA 2003) which has been analyzed in an EIR (URS Corporation 2003). WETA aims to increase regional mobility and transportation options by providing new and expanded water transit services and ground transportation terminal access in the San Francisco Bay Area. The WETA adopted the Final Transition Plan (Transition Plan) for the Bay Area on June 18, 2009.

There is potential for overlap with the WT in the siting of some of the new ferry terminals and potential expansion at others. In addition, new ferry routes would further increase the number of boats on the Bay. Proposed new routes include new routes to downtown San Francisco from Antioch-Martinez, Hercules, Berkeley, Redwood City, Treasure Island and Richmond, as well as a new South San Francisco-Oakland route. New terminal facilities may be required at some or all of these locations. The Transition Plan includes plans for three new service routes (Berkeley/Albany to San Francisco, Oakland to South San Francisco, and Treasure Island to San Francisco), environmental review of the San Francisco to Antioch-Martinez, San Francisco to Hercules, San Francisco to Redwood City, and San Francisco to Richmond routes, as well as investigation of other potential new routes as new major waterfront facilities are developed. With the three new ferry routes proposed in the Transition Plan, WETA estimates that there would be 94 daily (weekday) ferry trips.

WETLANDS CREATION AND RESTORATION PROJECTS

The State of California and the federal government together with local and regional agencies and non-profit organizations are currently working on the restoration of approximately 40,000 acres of former wetlands throughout the Bay region for wildlife, fisheries, flood management, and water quality enhancement. A large portion of these former wetlands would be returned to tidal action, and other areas would be managed as ponds, seasonal wetlands, and other types of habitats that support wildlife. In many areas, the restoration work would also provide for public access, wildlife-oriented recreation, and education opportunities. Construction of the restoration projects could cause temporary disturbances to wildlife, and may temporarily reduce available habitat in the vicinity of construction areas. Longer-term, these projects would increase the amount of habitat available to certain types of sensitive species.

4.1.2 IMPACTS OF PROJECT COMBINED WITH CUMULATIVE PROJECTS AND PROJECTED NON-WT-INDUCED INCREASED BOATING

The potential impacts for each resource area from the implementation of the WT Plan in combination with the cumulative projects and non-WT growth in NMSB use are evaluated below. Appropriate mitigation is also provided for each resource area, as needed. Potential cumulative impacts evaluated below include potential impacts to recreation, public services, navigational safety, biological resources, hydrology and water quality, and greenhouse gas emissions. Potential impacts to and mitigation measures for aesthetics, cultural resources, hazardous materials, land use planning, and transportation, circulation and traffic, are site-specific and would not result in Baywide cumulative impacts. Therefore these resources are not addressed further in this chapter.

RECREATION

Increases in both non-WT NMSB use and non-NMSB use would increase overall demand on existing and planned boat launching facilities. However, potential user conflicts would be evaluated during the trailhead designation process and the WT would strive to direct increased use to sites able to accommodate that growth. In addition, the WT would contribute to improved launch site facilities for NMSB as funding allows, and the overall increase in NMSB use attributable solely to implementation of the WT Plan would be small compared to the regional increases. The potential cumulative impact to recreation associated with increased recreational boating would be less than significant.

Implementation of the WT would complement the San Francisco Bay Trail program in providing for a full range of non-motorized recreational opportunities. Where the Bay Trail intersects with WT sites, the opportunity for sharing visitor amenities exists for the two programs (as identified in WT Strategy 2). The outreach and education functions of the Bay Trail could be used to provide information about the WT and vice-versa. While there could be individual locations where implementation of the WT Plan could conflict with new or expanded Bay Trail facilities, this potential concern would be site-specific. As such, this potential impact would be resolved through the trailhead planning process, and no cumulative impact would occur.

Potential user conflicts between WT sites and existing or new ferry terminals would be addressed during the trailhead designation process, and planning for new ferry terminals would require that potential impacts to nearby recreational facilities and recreational boating activities be addressed.

Thus, potential user conflicts at facilities would be addressed at the site-specific level, and no cumulative impact would occur.

Potential recreational impacts due to implementation of wetlands restoration projects would be minor, isolated, and of short duration. Although construction of wetland restoration projects could temporarily disrupt NMSB access to areas in which construction is occurring, the potential temporary disruptions in combination with any potential disruptions associated with the implementation of the WT are considered less than significant.

Consequently, the project's overall contribution to cumulative impacts to recreation would be **less than significant**.

NAVIGATIONAL SAFETY

As described in the Project Description and Section 3.3, use levels of WT-designated sites and other travel routes and areas now popularly visited by NMSB users would increase over time in concert with growth of other boating on the Bay. Such cumulative increases in overall boating on the Bay could result in an incremental increase in boating conflicts and hazards.

As discussed in Section 3.4, the USCG regulates navigation in San Francisco Bay by issuing and enforcing regulations that govern navigation practices, marine events, and safety and security zones within the Bay and is the primary search and rescue agency in a boating emergency throughout the Bay. The Inland Navigation Rules require a boater to try to avoid a collision even if she/he has the right of way, but without explicit, broadly accepted navigational protocols or norms for vessel interactions, the expected increases in fast ferry traffic, large sailing vessels, motorized recreational vessels, and WT users on the Bay may lead to more accidents. Increases in incidents may increase the USCGs' need for personnel or equipment. Some maritime user groups such as fast ferries are developing standard practices (e.g., consistent travel routes) to minimize accidents in general. The San Francisco Bay Harbor Safety Committee coordinates these and other efforts to improve navigational safety. In concert with the work of the USCG and Harbor Safety Committee, implementation of the proposed WT education and outreach program, which includes information on navigational safety, would help to reduce the potential cumulative effect to **less than significant**.

Planned and current wetland restoration projects would not result in any additional navigation challenges, and would not contribute to any potential cumulative impact. Consequently, the project's overall contribution to cumulative impacts to navigational safety would be **less than significant**.

PUBLIC SERVICES

Increased use of access sites due to the WT, coupled with increased use by other boaters and non-boating recreationists could lead to an increased need for public safety (police, fire and emergency medical) response. However, all access sites would undergo trailhead review, and the ability of the particular site to accommodate any increase in use (including the potential need for increased public services due to increased use from a variety of uses) would be evaluated during the trailhead designation process. The level of any increased need for public safety services at

any specific site would be small. The cumulative impact on public safety services of the project in combination with increased boating activity on the Bay and future development of the Bay Trail and WETA services would remain **less than significant**.

Planned and current wetland restoration projects would not affect the need for public services or result in any navigation challenges, and would not contribute to any potential cumulative impact. Consequently, the project's overall contribution to cumulative impacts to navigation and public services would be **less than significant**.

BIOLOGICAL RESOURCES -- VEGETATION

Construction and use of WT sites could lead to impacts on vegetation and sensitive habitats, as described in Section 3.7. Increased NMSB use could lead to increased unauthorized landings in sensitive habitats and an increased potential for spread of invasive plants. General increases in motorized boating as well as use of larger non-motorized boats on the Bay could incrementally increase impacts to wetland habitats; however, because these boats generally have deeper drafts than NMSBs, they are limited in their ability to access wetlands areas. Therefore, potential impacts to vegetation and sensitive habitats associated with increased motorized recreational boating and larger non-motorized boats would be limited.

Increased use of trailheads associated with increased use by boaters and other recreational users (i.e., due to projected growth in NMSB and motorized boat use not associated with the WT, and/or due to implementation of the Bay Trail) could also lead to increased trampling impacts where wetlands are located near WT trailheads. The Bay Trail attracts visitors to wetland areas, but encourages people to stay on the trail through signage, fencing, and trail design. Because many of the potential new NMSB users that would participate in the sport without the WT, as well as the numerous existing users, would be exposed to WT signage, outreach, and educational materials, the implementation of the WT may slightly reduce the impacts that these users would have on the environment. With the mitigations described in Section 3.7, the potential impact to wetlands from trampling, unauthorized landings and spread of invasive species would therefore be **less than significant**.

Potential cumulative impacts to wetlands could also result from construction activities associated with the implementation of the WT Plan, the WETA Transition Plan, the Bay Trail, and restoration projects. Construction activities could result in damage to or removal of wetlands. However, construction in or near wetlands and sensitive habitats would require site-specific mitigation, if allowed at all, and would therefore be mitigated at the site-specific level, as described in Section 3.7. Consequently, with implementation of the mitigations described in Section 3.7, potential cumulative construction-related impacts to vegetation and wetlands would remain **less than significant**.

BIOLOGICAL RESOURCES -- BIRDS

Increased boating of all kinds on the Bay, including regional increases in motorized and non-motorized recreational boating, increased ferry traffic, and increases in commercial boat traffic could increase disturbances to rafting waterfowl and sensitive birds, including nesting birds. As described in detail in Section 3.8, the educational materials and signage provided by the WT would be available to all recreational boaters, not just the small increase in NMSB users

potentially attributable to the implementation of the WT Plan, and the implementation of the education and outreach program of the WT is likely to off-set potential impacts due to the WT, and may result in a small overall reduction of disturbances to waterbirds. WETA would implement its own mitigation measures pursuant to the environmental documents addressing expanded ferry service. With implementation of the mitigation measures described in Section 3.8, therefore, cumulative impacts to waterbirds from the WT in combination with regional growth in recreational boating, ferry traffic and commercial boat traffic would be **less than significant**.

Potential impacts to sensitive birds could also occur from disturbance of habitat, including unauthorized landings in or land-based entry into sensitive habitat as well as disturbance and disruption of habitat due to construction. These types of impacts could result from increased boat use, implementation of the Bay Trail, and construction of wetland restoration projects. As described above (Biological Resources – Vegetation), implementation of the mitigation measures described in Section 3.7 would reduce potential impacts to wetlands and other sensitive habitat to **less than significant**. Thus, with implementation of the mitigations identified in Sections 3.7 and 3.8, potential cumulative impacts of the Proposed Project on birds in combination with projected increases in recreational boat use, increased and new ferry service, implementation of the Bay Trail, and implementation of wetlands restoration projects would be **less than significant**.

BIOLOGICAL RESOURCES – OTHER WILDLIFE

MARSH-DEPENDENT WILDLIFE

Potential cumulative impacts to marsh-dependent wildlife could result from construction activities associated with the implementation of the WT Plan, the WETA Transition Plan (construction of new ferry terminals), the Bay Trail, and restoration projects. Construction in or near wetlands and sensitive habitats would require site-specific mitigation, and would therefore be mitigated at the site-specific level. With implementation of the mitigation measures outlined in Section 3.9, potential cumulative construction-related impacts to marsh-dependent wildlife would remain **less than significant**.

Increased NMSB use in and around wetland areas could also lead to increased impacts to the marsh-dependent wildlife. General (non-WT-induced) increases in recreational boating could incrementally increase impacts to wetland habitats. Because many of the potential new NMSB users that would participate in the sport without the WT, as well as the numerous existing users, would be exposed to WT signage, outreach, and educational materials, the implementation of the WT may slightly reduce the impacts that these users would have on the environment. Motorized boats and larger non-motorized boats generally have deeper drafts than NMSBs and are limited in their ability to access wetlands areas. Therefore, impacts associated with increased motorized recreational boating and larger non-motorized boats would also be limited. The Bay Trail attracts visitors to wetland areas, but encourages people to stay on the trail through signage, fencing, and trail design. The potential cumulative effect on marsh-dependent wildlife would remain **less than significant** with the mitigation described in Section 3.9.

SEALS

Neither the implementation of the WETA Transition Plan nor the continued build-out of the Bay Trail would increase impacts to seals. Similarly, most wetland restoration projects would not

affect potential haul-out sites, and where haul-out sites are present, each restoration project would implement the required mitigation.

However, increased motorized and larger non-motorized boating on the Bay in combination with increased NMSB use could have the potential to further impact seals, particularly at the pupping sites. Implementation of the mitigation measures identified in Section 3.9 of this document, would help to reduce potential impacts associated with all NMSB use, not only the small increase in NMSB use potentially associated with the implementation of the WT Plan. Consequently, the potential cumulative impact to seals of the Proposed Project in combination with the other projects would remain **less than significant**.

HYDROLOGY AND WATER QUALITY

The cumulative impacts of the WT project on the hydrology and water quality of the Bay would be limited to impacts related to increased impermeable surfaces in the watershed. The proposed increase in impermeable areas due to the WT in combination with regional development of the Bay Trail and the WETA Transition Plan would be very minor within the scope of existing development in the Bay Area, and would not substantially increase pollution due to run-off into the Bay. In addition, new or expanded WT facilities and parking would be highly dispersed around the Bay, and impacts would be further mitigated by mitigation measures identified in this EIR. Therefore, they would not contribute to cumulative water quality impacts. Potential overlapping cumulative impacts associated with individual WT sites would be addressed in the project-level reviews of the Trailhead Plans for those sites. Therefore, with implementation of the mitigation measures described in Section 3.12, potential cumulative impacts to hydrologic and water quality conditions in the Bay would remain **less than significant**.

GREENHOUSE GASES AND CLIMATE CHANGE

As discussed in Section 3.15 of this EIR (Greenhouse Gas Emissions and Climate Change) and more specifically in Section 3.15.6 (Impacts and Mitigation Measures), the revised CEQA guidelines pose two questions that must be answered in assessing the environmental effect of a project's greenhouse gas (GHG) emissions: 1) Does the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment? and 2) Does the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs?

In the absence of any adopted statewide guidelines for GHG emission impacts and thresholds of significance, the only criterion available to the Conservancy to measure the significance of impacts is to assess whether the project would be in conflict with the AB 32¹ State goals for reducing GHG emissions. Although BAAQMD adopted guidelines applicable to the Bay Area on June 2, 2010, those guidelines have not been adopted by the Conservancy, which precludes their use as a measure of the significance of impacts for this analysis. However, their adoption by BAAQMD does make them suitable for consideration under the second question above and strengthens their usefulness to this evaluation of potential cumulative impacts of GHG emissions. For the purposes of this EIR, then, the project would be considered to have a

¹ Assembly Bill No. 32; California Health and Safety Code, Division 25.5, Sections 38500, et seq. (California Global Warming Solutions Act of 2006).

significant impact if implementation of the project would conflict with the AB 32 State goals for reducing GHG emissions. The BAAQMD-adopted threshold of 1,100 metric tons per year for any “land use project” below which the effects of a project would be deemed “not significant,” is used to establish additional context in which to consider the order of magnitude of WT Plan-generated GHG emissions.

BAAQMD arrived at this proposed threshold through an eight-step analysis by which it identified the additional extent of reductions in GHG emissions associated with land use projects that must be achieved, apart from what will be achieved by statewide emissions reduction strategies under the AB 32 Scoping Plan, in order to meet the AB 32 requirement of reducing GHG emissions to the 1990 level by 2020. Based on this analysis, BAAQMD concluded that if additional GHG emissions reduction measures were required of any project that exceeded annual GHG operational emissions of 1,100 metric tons per year, the AB 32 requirement would be met. Thus, any land use project that falls below this threshold need not include any further reduction measures and could be considered as “not significant” with respect to cumulative GHG emissions impacts.

Application of the process and methodology prescribed by the CEQA Guidelines (described in Section 3.15.6) to assess cumulative impacts from GHG emissions associated with this project indicated that implementation of the WT project would slightly increase GHG emissions in the project area, and that there would be some emission reductions expected from the replacement of non-local trips made by non-motorized boat owners with local trips to San Francisco Bay. The process and methodology that led to this conclusion is presented in detail in Appendix G.

The GHG evaluation estimated that GHG emissions associated with construction of projects that can be anticipated under implementation of the WT Plan over the next 10 years would be approximately 46.5 metric tons of CO₂e per year during construction. These construction-related emissions would be temporary and finite in nature and spread over the useful life of the improvements.

The GHG emissions associated with additional vehicle trips attributable to the WT Plan (“operational emissions”) are estimated to be 2,483 metric tons over 20 years, or 124 metric tons/year. However, a small portion of longer, out-of-the-area vehicle trips would be expected to be replaced with local trips once the WT is established. The replacement of longer, out-of-the-area trips with local trips would reduce vehicle emissions by an estimated 1,046 metric tons over 20 years, or -52 metric tons/year. The total operating GHG emissions reasonably attributable to WT-related vehicle trips would thus be 72/tons of CO₂e/year (124 – 52). The total GHG emissions reasonably attributable to implementation of the WT Plan on an annual basis, therefore, when vehicle trips and construction are combined, would be 170.5 metric tons/year (46.5 + 124) and 119 metric tons/year when reductions are considered (46.5 + 124 – 52). As a point of comparison, these annualized emissions are only a small fraction of the 1,100 metric tons/year significance threshold adopted by BAAQMD, . An annual emissions rate of 119 metric tons CO₂e/year corresponds to 0.0002 % of the annual emissions in the Bay Area, and 0.00003% of annual emissions in California.

The WT Project would be implemented throughout the Bay Area, and thus the project is not subject to meeting the requirements of any city or county Climate Action Plan (although the requirements of a given plan may apply to construction of WT facilities within a city or county).

Other recreational activities, including the expansion of the Bay Trail, and increased non-motorized and motorized boat use of the Bay that is not related to the WT could also result in increases in GHG emissions. Implementation of increased ferry service would be expected to, overall, slightly reduce commute-related GHG emissions, and new wetland restoration projects would be expected to serve as long-term carbon sinks, compensating for their construction-related GHG emissions after several years of marsh development. These projects would therefore not contribute to any cumulative increases in GHG emissions.

Tidal wetland restoration projects are typically carbon sinks. While these projects result in construction-related GHG emissions, tidal marshes can be highly effective at sequestering CO₂. For example, the Draft EIS/EIR for the Sears Point Restoration Project estimates that the approximately 1,000 acres of restored wetlands will sequester between 800 and 4,500 tons of CO₂ per year (Sonoma Land Trust, et. al 2009). Thus tidal marsh restoration projects would have a beneficial effect on cumulative GHG emissions.

Measures related to the reduction of GHG emissions through reducing the need to access trailheads by car are found in WT Plan Strategies 11 and 12. These measures are broadened and strengthened in Strategy 28 of the Enhanced Water Trail Plan Alternative, discussed in Chapter 5 (Alternatives to the Project). For example, the WT would encourage use and development of access sites that are accessible by public transportation, and, as part of the WT ethic, would encourage awareness of climate change, and actions that individual boaters could take to reduce their carbon footprint (e.g., carpooling or taking public transportation to the trailhead, boating closer to their homes, using non-motorized boats instead of motorized boats, etc.). None of these measures could reasonably be expected to fully mitigate for cumulative increases in GHG emissions. However, on balance, the cumulative impact of implementation of the Water Trail Plan in combination with other projects such as the Bay Trail, ferry traffic, and wetland restoration would be minimal. At the scale of impacts now being considered by the California Air Resources Board under AB 32 and within the context of viable near-term options for public transportation and recreation, these impacts are minimal.

Based on the foregoing, the cumulative GHG emission impacts due to implementation of the WT Plan are considered **less than significant**.

4.2 Growth-Inducing Impacts

CEQA requirements for evaluation of growth-inducing impacts are set forth in Section 15126.2 (d) of the CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387). CEQA requires that both direct and indirect impacts of all phases of a proposed project be considered. Growth-inducement is typically considered to be a direct or indirect effect of an action that either directly fosters growth or removes an obstacle to economic or population growth, or the construction of new housing. The CEQA Guidelines also require evaluation of new infrastructure and service facilities needed to serve growth induced by a

project. The Guidelines note that “it must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.” Therefore, the nature of the effects of any induced growth also must be considered to determine if the impacts of that growth are potentially significant.

Some projects may be considered growth inducing while others may be growth accommodating (i.e. they are intended to accommodate planned growth, but do not induce that growth). The distinction is primarily whether or not a project removes an obstacle to growth. It is sometimes argued that, if growth is already planned for in a jurisdiction’s General Plan, then infrastructure supporting that development is growth accommodating rather than growth inducing. However, CEQA is concerned with on-the-ground impacts to the environment. Therefore, if planned development cannot move forward absent a particular infrastructure project, or the development is substantially encouraged by that infrastructure, that project is generally considered growth inducing. The CEQA Guidelines also state (Section 16064 (d)(3)) that an indirect physical change is to be considered only if that change is “a reasonably foreseeable impact which may be caused by the project. A change which is speculative or unlikely to occur is not reasonably foreseeable.”

The WT Plan includes potential trailhead site designation and education/outreach components. Some additional relatively minimal facility development may occur if the WT Plan is implemented. This development would likely be of small scale and would serve local and regional recreational boaters. It is unlikely that this development would be of a scale to induce substantial additional economic or physical development beyond the immediate access point. As discussed in the Project Description and in Section 3.3 (Recreation) of this EIR, the project is not expected to substantively increase the use of NMSBs in the San Francisco Bay estuary beyond the expected growth levels without the WT. Impacts of this growth are addressed in Chapter 3 of this EIR. The WT Plan site designations and subsequent education and site improvements could result in shifting of boating use to and from certain sites. As noted above, this sort of shift in recreation use is unlikely to induce growth beyond the local access point. Therefore potential growth-inducing impacts would be **less than significant**.

4.3 Significant Unavoidable Environmental Effects

This EIR identified a number of potentially significant impacts in each of the analyzed topics. All of those impacts were found to be at a less than significant level by application of the mitigation measures identified in this document.

4.4 Irreversible/Irretrievable Environmental Effects

Public Resources Code Section 21100(b)(2)(B) and CEQA Guidelines Sections 15126(c), 15126.2(c) and 15127 provide that the EIR for a project that involves adoption of a plan of a public agency, such as the WT Plan, must consider “significant irreversible environmental changes” that may be caused by the project. Guidelines Section 15126.2(c) clarifies that use of non-renewable resources during the initial and subsequent phases of a project may be “irreversible”, if a *large commitment* of non-renewable resources may make subsequent discontinuance or removal of the project thereafter unlikely.

Implementation of the WT would result in the use of natural resources including fossil fuels and building materials associated with the printing and dissemination of educational materials, construction of facility improvements, and boaters getting to and from the WT access sites. However, the use of resources under these activities are quite minor, are far from a ‘large commitment’ of resources, and, with implementation of the required avoidance and mitigation measures will be less than significant both individually and cumulatively, as discussed at length in this EIR. The WT Plan does not pose any significant risk of long-term and material use of resources such that one could reasonably conclude that it would result in future “irreversible effects”.

5 ALTERNATIVES TO THE PROJECT

5 ALTERNATIVES TO THE PROJECT

This chapter describes three alternatives to the Proposed Project, and evaluates the environmental impacts of those potential alternatives compared to those of the Proposed Project. It also identifies the environmentally superior alternative (see Section 5.4, below).

5.1 GENERAL CEQA REQUIREMENTS FOR ALTERNATIVE EVALUATION

CEQA requires that a reasonable range of feasible alternatives to the Proposed Project be described and considered within an EIR. The alternatives considered should represent scenarios that could feasibly attain most of the basic objectives of the project, and would avoid or substantially lessen any of the significant environmental effects of the project. The purpose of this process is to provide decision-makers and the public with a discussion of viable options and to document that other potential options that could avoid or substantially lessen one or more of the Proposed Project's significant environmental effects were considered (CEQA Guidelines, §15126.6).

CEQA provides the following guidelines for discussing project alternatives:

- An EIR need not consider every conceivable alternative to a project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation (§15126.6(a)).
- An EIR is not required to consider alternatives that are infeasible (§15126.6(a)).
- The discussion of alternatives shall focus on alternatives to the project or its location that are capable of avoiding or substantially lessening any significant effects of the project (§15126.6(b)).
- The range of potential alternatives to the Proposed Project shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects §15126.6(c)).
- The EIR should briefly describe the rationale for selecting the alternatives to be discussed §15126.6(c)).
- The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis and comparison with the Proposed Project §15126.6(d)).

5.2 PROJECT ALTERNATIVES

Although the Proposed Project was determined not to have any significant unmitigable impacts, a range of alternatives is presented in this document for the consideration of the public and decision-makers.

5.2.1 ALTERNATIVES CONSIDERED AND REJECTED FROM FURTHER ANALYSIS

The SCC, as CEQA lead agency, considered a full range of alternatives to the Proposed Project. These alternatives included:

- **Partial Water Trail Alternative:** This alternative would limit the Water Trail to certain areas of the Bay (e.g., the Central Bay). This alternative was rejected because it would not meet the legislatively-mandated goals of the WT Act to improve access within, and provide recreational opportunities to, the entire Bay Area.

- **Site Closure Alternative:** An alternative that would result in the closure of access sites that may adversely affect sensitive resources was considered but eliminated because under the Water Trail Plan, the Project Management Team has only the authority to designate a WT site, but has no legal authority to order closure of existing access sites.
- **No Major New Facilities Alternative:** An alternative that would reduce or eliminate construction impacts at access sites being considered for WT designation (either with regard to impacts of the construction, or impacts due to increased use associated with enhanced facilities) by prohibiting major facility improvements was considered and determined to be infeasible. Under the WT Act, the Project Management Team has the authority to designate a WT site, but no legal authority to prohibit additional development of existing sites or new future sites. A similar but more feasible alternative – the HOS Only Alternative – is fully evaluated below.
- **Carbon-Neutral Alternative:** An alternative that would prohibit a net increase in the emission of GHGs in the process of arriving at a trailhead or in the process of constructing or enhancing a trailhead was considered but eliminated because it would require that all NMSBs used at WT sites be stored on location and that any increase in NMSB use occur through people arriving at the sites in a manner that did not burn any fossil fuels, such as on foot or on bicycle or by zero-emission public transportation. Although a small number of people could accomplish this scenario at a small number of sites, this alternative would undermine one of the fundamental goals of the Water Trail Act, which is to provide enhanced public access and recreational opportunities on and around the Bay. As discussed under the “No Major New Facilities Alternative” above, prohibition of any construction at WT trailheads is infeasible.

5.2.2 ALTERNATIVES EVALUATED IN THIS EIR

The Proposed Project is described in Chapter 2 of this EIR and evaluated in Chapter 3. Three alternatives to the Proposed Project are evaluated in this chapter: Alternative 1, the CEQA-mandated No Project Alternative; Alternative 2, the High Opportunity Sites (HOS) Only Alternative; and Alternative 3, the Enhanced Water Trail Plan Alternative. These three alternatives and their potential impacts, including cumulative impacts, as appropriate, are described below. Cumulative impacts were evaluated using the same recreational boating projections and cumulative projects described in Chapter 4.

5.3 EVALUATION OF ALTERNATIVES

5.3.1 ALTERNATIVE 1: NO PROJECT

DESCRIPTION OF ALTERNATIVE 1

Under Alternative 1, the No Project Alternative, the WT Plan would not be implemented. No new infrastructure, signage, education, outreach, or other WT activities would be implemented by the WT program. Many planned sites identified in the WT Plan, such as Eden Landing (A22), would be developed even in the absence of the WT, as exemplified by the opening of the “planned” launch site at the Alviso Marina (SC2) in June, 2010. New sites would be developed, and some existing sites would be enhanced. NMSB use would increase Baywide as the regional

population continues to grow and in response to other demographic changes, such as the retirement of “baby boomers,” many of whom will have more time to recreate around the Bay. This general growth would drive the need for new facilities and access sites. As discussed in Chapter 2, these factors would form the basis for the majority of the projected growth in NMSB use. Therefore, under the No Project Alternative, the majority of the projected growth in NMSB use would still occur; the only difference in growth in NMSB use between the No Project Alternative and the Proposed Project is that the Proposed Project would potentially generate a very small increase in NMSB use due to increased publicity and education. Facility improvements would occur on an *ad hoc* basis by over 50 local and regional jurisdictions. Education, navigational safety, and environmental protection efforts would likewise continue to be implemented as they currently are, with each governmental agency, organization, or private business determining its own priorities, standards of quality, and content as allowed by existing plans, laws, and necessary permits. There would be no attempt to guide or plan NMSB use on a regional basis.

By definition, because an “impact” is an adverse consequence of a proposed project, when there is no project, there can be no impacts. Consequently, there are also no cumulative impacts associated with the No Project Alternative. However, environmental effects would continue to occur as a result of the anticipated non-WT-induced growth in NMSB use. Because the WT would not be implemented, there would be no coordinated effort to educate NMSB users. In comparison to the Proposed Project, then, potential environmental effects absent the WT could be greater for some resources than potential effects with the Proposed Project. Potential effects on recreation, navigational safety, public services, and biological resources (vegetation, birds, and other wildlife) may be slightly less with the Proposed Project than under the No Project Alternative, because the Proposed Project would provide more coordinated planning and improved educational and safety information and signage than the No Project Alternative. The potential environmental effects associated with the No Project Alternative are summarized below.

DESCRIPTION OF THE NO PROJECT ALTERNATIVE’S ENVIRONMENTAL EFFECTS

RECREATION

Under the No Project Alternative, recreation planning for NMSB use would continue to occur primarily at the local level, and opportunities for regionally-coordinated, optimal placement of new facilities and new access locations would not be realized. Most notably, regional maps, brochures, guidebooks, boating educational materials, and other trip planning materials and assistance tailored for the nine-county Bay Area would not be developed. Changes in use levels at facilities may occur, as individual jurisdictions and owners/managers undertake improvement projects and their own publicity efforts, retail businesses serving NMSB use are established at certain sites, or sites deteriorate to the point of not being usable. Facilities that are provided may or may not meet all the needs of NMSB users, as some jurisdictions may lack the expertise to properly prioritize needed facilities and design the best site lay-out. The No Project Alternative provides fewer benefits to recreation, and may result in a slight increase in recreational conflicts compared to the Proposed Project.

NAVIGATIONAL SAFETY

Under the No Project Alternative, educational materials on the subject of navigational safety hazards would not be developed, coordinated, or distributed by the WT. Safety training would continue on an *ad hoc* basis, and access sites would not receive any new project-related signage pertaining to safety considerations. Navigational risks that may be associated with existing, new, or enhanced sites would still occur. As with the Proposed Project, increased use of NMSBs may lead to an increase in incidents (increased use of all kinds of boats on the Bay may also increase the rate of incidents). Effects on navigational safety associated with the No Project Alternative would likely be slightly greater than if the Proposed Project is implemented.

PUBLIC SERVICES

Under the No Project Alternative, growth in NMSB use would still occur, and increased public services may be required to support increased use at existing access sites and any new sites that are constructed. Increased public services could also be required at locations where site owners are providing new or improved facilities. Because no action supported by the WT would be taken to improve navigational safety, the demand for emergency services may be slightly higher for the No Project Alternative than for the Proposed Project.

AESTHETICS

Under the No Project Alternative, no new access facilities would be supported by or developed pursuant to the WT. However, new facilities would continue to be developed at various sites around the Bay in response to boater demand or owner initiative. New facilities would be subject to local, state, and federal agency design review, as applicable, but not to WT Trailhead Plan review. It is likely that the No Project Alternative would have an overall similar effect on visual quality as the Proposed Project.

BIOLOGICAL RESOURCES – VEGETATION

As described above, under the No Project Alternative, projected growth in NMSB use would still occur, leading to a higher number of NMSB users potentially coming into contact with sensitive habitat and/or contributing to the spread of invasive plants. Most facility improvements and new (planned) sites would likely still be constructed to accommodate the increase in NMSB use, leading to potential effects on sensitive habitats as a result of construction activities; however, these impacts would be controlled through site-specific permits and associated mitigation requirements. Because the No Project Alternative would not provide the educational component, the avoidance strategies, and the mitigation measures included in the Proposed Project, vegetation would likely be affected to a somewhat greater degree than under the Proposed Project.

BIOLOGICAL RESOURCES -- BIRDS

Waterbirds

Under the No Project Alternative, projected growth in NMSB use would still occur, leading to a higher number of NMSB users potentially coming into contact with rafting birds. Most facility improvements and new (or planned) sites would likely still be constructed to accommodate the increase in NMSB use, leading to potential effects on waterbirds in areas reachable by NMSBs launching from new or existing access sites. Because the No Project Alternative would not provide the educational component and the avoidance strategies included in the Proposed

Project, the effects of the No Project Alternative would be slightly greater than the effects of the Proposed Project.

Tidal-Flat Specialists (Shorebirds)

The No Project Alternative would have no discernible effect on tidal-flat specialists because there would be little or no anticipated disturbance to shorebirds due to NMSB use. Shorebirds forage on exposed tidal flats, which is habitat unavailable to watercraft. Likewise, when the tidal flats are inundated and accessible to watercraft, shorebirds gather to roost at supratidal habitats – seasonal wetlands, emergent tidal marshes, levees, jetties, piers, docks, etc. Therefore there would be no substantive difference in effects between the No Project Alternative and the Proposed Project

BIOLOGICAL RESOURCES – OTHER WILDLIFE

Seals

Under the No Project Alternative, some increased disturbance to harbor seal haul-out sites could still occur from the overall increase in NMSB use. Current seasonal closures of sensitive areas (e.g., Mowry Slough) would remain in place and the USFWS may implement additional seasonal closures with or without the Proposed Project. However, there would be no overall effort to educate boaters about the need to avoid seal haul-out areas and about the special sensitivity of seals during pupping and molting seasons. Thus potential effects to seals from on-going use of NMSBs would likely be slightly greater than for the Proposed Project. Potential effects on seals associated with the No Project Alternative would likely be similar to the Proposed Project with respect to the potential for construction-related impacts because such activities would be regulated by permits.

Other Marsh-Dependent Sensitive Wildlife

Under the No Project Alternative, the projected growth in NMSB use would still occur, leading to a higher number of NMSB users potentially coming into contact with marsh-dependent sensitive wildlife. The No Project Alternative would not include the Proposed Project's educational component and its avoidance strategies, however.. Therefore, potential effects on other marsh-dependent sensitive wildlife associated with the No Project Alternative would likely be similar to the Proposed Project with respect to potential construction-related impacts, but due to the lack of educational materials and outreach, may be greater overall.

CULTURAL RESOURCES

The No Project Alternative would avoid the potential for the WT to influence development of new access sites or major enhancement of existing sites in the future, but would not be any different from the Proposed Project with regard to regulations protecting cultural resources. Existing plans for the development of new access sites, new facilities, or facility enhancements for NMSB use may be developed independent of the WT planning process. Therefore, effects of the No Project Alternative on cultural resources would be similar to those of the Proposed Project.

HAZARDOUS MATERIALS

The No Project Alternative would avoid the potential for the WT to influence the development of new access sites or major enhancement of existing sites, and therefore reduce the potential for project-related activity that could expose hazardous materials if those activities were funded by

sources that could only be used for WT-related purposes. As described in Chapter 2, however, most new facilities and new access sites would likely still be developed whether or not the WT is implemented. Therefore, the potential of the No Project Alternative to expose humans or the environment to hazardous materials would be similar to those of the Proposed Project.

HYDROLOGY AND WATER QUALITY

The No Project Alternative would likely result in a similar level of development of new sites or enhancement or addition of new facilities at existing sites as would the Proposed Project. Therefore, the effects of the No Project Alternative would generally be similar to those of the Proposed Project.

LAND USE PLANNING

Under both the No Project Alternative and the Proposed Project, the San Francisco Bay Plan policies for access to the Bay would continue to govern land use planning within the shoreline band of the Bay. In addition, local, regional, state, and federal agencies' plans for lands under their jurisdictions would continue to guide development of new or improved Bay access under the No Project Alternative or the Proposed Project. It is therefore likely that there would be little difference in land use effects between the No Project Alternative and the Proposed Project, although the Proposed Project would provide beneficial effects due to the regional planning and additional CEQA review of facility improvements inherent in the Trailhead Designation process.

TRANSPORTATION, CIRCULATION AND PARKING

Under the No Project Alternative, local and regional transportation demand increases and traffic facility improvements would continue to occur, as they would under the Proposed Project. Site-specific facility improvements would still be required to undergo CEQA (and/or NEPA, if applicable) review for traffic impacts and mitigations, if the proposed improvements were large enough. Development of Trailhead Plans that would consider traffic and parking needs, and additional CEQA review during the trailhead designation process, would not exist under this alternative. Overall, the effects on transportation, circulation, and parking would be similar under the No Project Alternative or the Proposed Project.

GREENHOUSE GASES AND CLIMATE CHANGE

Under the No Project Alternative, no WT-related construction would occur. There would be no incremental growth in NMSB use due to WT publicity and educational materials, and associated vehicle use. This would eliminate GHG emissions associated with implementation of the WT. However, most of the proposed construction of new facilities and facility improvements would still occur under the No Project Alternative, as would the growth in NMSB use and associated vehicle use. Consequently, in the short term, potential GHG emissions under the No Project Alternative would likely be slightly smaller or similar to GHG emissions under the Proposed Project. However, because there would be no coordinated effort to reduce vehicle miles traveled, longer term emissions of GHGs under the No Project Alternative may exceed the emissions of the Proposed Project.

5.3.2 ALTERNATIVE 2: HIGH OPPORTUNITY SITES ONLY

DESCRIPTION OF ALTERNATIVE 2

The goal of the HOS Only Alternative is to eliminate potentially significant WT-related impacts by eliminating sites with management concerns from the original list of Backbone Sites, leaving only sites that meet the HOS criteria. As described in Chapter 2, Project Description, HOSs are those sites that have no substantial management concerns and are expected to require only signage for inclusion in the Water Trail. A preliminary list of 57 HOSs is included in the WT Plan and presented in Table 2.3.2-1. Alternative 2 would effectively limit potential construction activity at WT sites by only considering sites that meet the criteria for an HOS and generally remain neutral on the use of other public access sites already available to the public for NMSB use.

For Alternative 2, the trailhead designation process would consist solely of development of a Site Description and Signage Plan. Any site that would require a detailed Trailhead Plan would be eliminated from further consideration for the WT. The actual list of HOSs for Alternative 2 cannot be defined with complete certainty at this time, because conditions at some sites may have changed since the preliminary list of HOSs was developed during the preparation of the Draft WT Plan from 2005 – 2007. It is likely, however, that the final number of HOSs would be similar to the number of preliminary HOSs (i.e., some sites preliminarily identified as HOSs might fail to meet HOS criteria, whereas some sites not originally identified as HOSs might meet HOS criteria). Figure 2.3.2-1 shows the location of the preliminary list of HOSs around the Bay.

The effect of restricting the WT to HOSs is that the WT would influence NMSB user behavior and site management at those sites, but otherwise boating would continue as at present at all other sites around the Bay. As is the case for the Proposed Project, improvements at non-WT sites would occur at the discretion of the site owners/managers and permitting agencies and new recreational sites could be established. The overall level of non-HOS access site development and use is likely to be similar to that for the Proposed Project. Thus, the goal (under this alternative) of limiting potentially significant NMSB-related impacts (by not designating any sites with any management concerns) would not be met by this alternative.

Growth in NMSB use would be very similar to the level of growth that would occur with the Proposed Project, because the majority of anticipated growth in NMSB use would be due to population growth and other demographic factors. Reducing the number of sites included in the WT would not substantively affect that growth in NMSB use or determine where NMSB users would choose to recreate.

The non-HOSs would not be designated as WT sites, nor would the WT assist with any improvements, or site-specific education or outreach programs associated with those sites.

Many of the mitigation measures developed for the Proposed Project would also apply to Alternative 2. Mitigation measures pertaining to impacts associated with construction or improvement of facilities and avoidance of sensitive habitat on or in the immediate vicinity of the site would not be applicable because sites having these types of issues would not be classified as HOSs. All applicable mitigation measures are incorporated into Alternative 2.

EVALUATION OF IMPACTS

RECREATION

The HOS Only Alternative would reduce the recreational and public access benefits of the project because it would limit the total number of sites to be supported by the Water Trail to HOSs (preliminarily estimated to be 57 sites) instead of potentially 112 or more. It could result in increased use of some HOSs, based on the fact that outreach materials would focus on these sites. Because the WT would consist of only a portion of the Backbone Sites, overall planning and coordination of access on a Bay Area-wide scale, as required in the WT Act, would not be possible. As a result, new non-Water Trail NMSB facilities may not be constructed in optimal locations, and site spacing could be less favorable or safe for NMSB users. Potential conflicts between NMSBs and other recreational activities may or may not remain the same between this alternative and the Proposed Project, depending on whether such conflicts occur at HOS or non-HOS sites. Thus, potential impacts to recreation under Alternative 2 would be quite similar to those for the Proposed Project, but potential benefits to recreation and public access would be decreased. Cumulative impacts to recreation may be slightly greater than under the Proposed Project because possibly as many as half of all access sites around the Bay would not be part of the WT's regional planning efforts.

NAVIGATIONAL SAFETY

Under the HOS Only Alternative, some NMSB use could be redirected toward the HOSs by WT outreach information. Some HOSs are near ferry terminals and shipping channels, and any existing navigational dangers associated with these sites would continue to exist. However, the total number of WT access sites, and consequently the incremental growth in NMSB use attributable to the project would be lower than for the Proposed Project, and the potential impact of the HOS Only Alternative on navigational safety would likely be slightly less than for the Proposed Project.

Regional, non-Water Trail-related NMSB growth would continue and NMSB use at all existing non-HOS sites would continue. The HOS Only Alternative would limit the project's proposed site-specific educational and safety components to HOSs only, thus decreasing the Proposed Project's potential to provide these services to many more sites. Cumulative impacts to navigational safety from growth in NMSB use on the Bay coupled with growth in motorized boats may therefore be somewhat greater for Alternative 2 than for the Proposed Project because of the lack of site-specific educational and safety activities at non-HOSs.

PUBLIC SERVICES

Limiting the project to HOSs only under this HOS Only Alternative may result in increased use of these sites over time because only this more limited set of sites would be actively publicized, leading to potentially higher use of HOSs compared to the Proposed Project. Potential demands on public services would therefore be the same or slightly greater at HOSs as compared to the Proposed Project. Under the HOS Only Alternative, however, there would be about half as many sites, so total demand on public services would be decreased in comparison to the Proposed Project, and the potential impact to public services from the HOS Only Alternative would be slightly lower than for the Proposed Project.

Cumulative impacts on public services would likely be similar to or slightly greater than the Proposed Project because the regional increase in NMSB use due to population growth and other demographic factors would be similar to that anticipated for the Proposed Project. Existing boating hazards and thus the need for public emergency services would remain at all existing sites and any new sites, with only the HOSs benefiting from the full educational and safety components of the WT program. Further, the WT program would not be working with site owners/managers of non-HOSs to help improve management for NMSB use at existing sites or helping to plan for anticipated services needed at future sites.

AESTHETICS

The HOSs require, by definition, virtually no development beyond signage. Development at non-HOSs would occur without any association with the WT and at the discretion of the site owners and managers and any necessary agency review or permitting. The HOS Only Alternative would reduce the potential project-induced impact on visual resources to those at HOSs only. Under Alternative 2, potential impacts to aesthetics associated with the implementation of the WT would be less than those associated with the Proposed Project. Cumulative aesthetic impacts of NMSB launch site development/modification under the HOS Only Alternative would likely be the same as for the Proposed Project, because site owners and managers of any site around the Bay would have to meet agency review and permitting requirements, thus decreasing the likelihood of aesthetic impacts despite enhancements occurring at a greater number of sites.

BIOLOGICAL RESOURCES – VEGETATION

HOSs would be identified as such in part because they pose only a minimal potential for impacts to sensitive habitats and species. Thus, the potential for WT-related impacts to sensitive habitat and sensitive plants under the HOS Only Alternative is lower than under the Proposed Project. However, under this Alternative, site-specific WT educational materials, signage, and other programs would not be made available to the other Backbone Sites, which would continue to be managed at the discretion of the site owners. Most facility improvements and the planned sites identified in the WT Plan would likely still be constructed to accommodate the increase in NMSB use, leading to potential effects on sensitive habitats as a result of construction activities. These construction-related impacts, however, would be controlled through site-specific permits and associated mitigation requirements, and cumulative impacts on vegetation due to construction are expected to be similar to the Proposed Project. Cumulative impacts to vegetation resulting from use of access sites under this Alternative would be greater than under the Proposed Project because overall use levels of NMSBs on the Bay are expected to increase and the WT program would not be working with site owners/managers of non-HOSs to reduce the potential for spread of invasive species or to educate users with regard to protection of sensitive habitats.

BIOLOGICAL RESOURCES – BIRDS

Rafting Waterbirds, Nesting Waterbirds (Including Threatened and Endangered Species), and Tidal Marsh Birds

The HOS Only Alternative would eliminate sites that require more than just the addition of signage to avoid potential impacts to rafting or nesting waterbirds or tidal marsh birds in general. Therefore, potential levels of disturbance directly attributable to the WT may be lower in this alternative than in the Proposed Project. However, NMSB use would continue at existing non-

HOSs, and the project's site-specific education and management programs would not be extended to those sites. Therefore, existing biological effects from those sites would continue, and would likely increase as use increases due to population growth and other demographic factors. The lack of education for these non-HOS access locations would likely result in a somewhat greater effect on waterbirds from non-HOSs than under the Proposed Project. Therefore, cumulative impacts of this Alternative with the remaining Backbone Sites not included under this Alternative, and other activities that could disturb rafting waterbirds, nesting waterbirds, and/or tidal marsh birds, including the Bay Trail, ferry boat expansion, and temporary disturbances due to wetland restoration, would be somewhat greater than cumulative impacts associated with the Proposed Project.

Tidal-flat Specialists (Shorebirds)

As with the Proposed Project, the HOS Only Alternative would result in no significant disturbance to shorebirds because shorebirds forage on exposed tidal flats, which is habitat unavailable to watercraft. Likewise, when the tidal flats are inundated and accessible to watercraft, shorebirds gather to roost at supratidal habitats – seasonal wetlands, emergent tidal marshes, levees, jetties, piers, docks, etc. Therefore, there would be no substantive difference in impacts between this alternative and the Proposed Project, both regionally and cumulatively.

BIOLOGICAL RESOURCES – OTHER WILDLIFE

Seals

Because HOSs would not be located near known seal haul-outs and would not have site construction related to the WT, potential disturbance to seals under the HOS Only Alternative would be minimal or non-existent. Given the reduced number of Water Trail sites under this Alternative, and its elimination of non-HOSs (which would include some sites with the potential to affect seal haul-out sites), potential impacts would be less than under the Proposed Project. Under this Alternative, however, NMSB use would continue at existing non-HOSs, and the project's site-specific education and management programs would not be extended to those sites. Therefore, existing impacts to harbor seals from non-HOSs would most likely continue, and increase as NMSB use increases over time due to general population growth and other demographic factors. Consequently cumulative impacts of the HOS Only Alternative would be slightly greater than cumulative impacts associated with the Proposed Project and other projects that may affect seals.

Other Marsh-Dependent Sensitive Species

Because only signage would be needed at HOS sites, potential construction disturbances to sensitive habitats sheltering special status marsh-dependent species would be small or non-existent under the HOS Only Alternative. The potential impacts to these species would be lower under this Alternative than for the Proposed Project because there would be fewer sites associated with the WT. This would reduce the potential WT-related spread of invasive species through NMSB activities, predator impacts from trash generation, and trampling impacts in sensitive habitat. However, the remaining access sites not included in this Alternative would still be used, and the cumulative impact of NMSB use from HOSs and non-WT sites combined with other boating activities and expected population growth would be greater than for the Proposed Project, because the sites not included in the WT would not receive the benefits of the site-specific education, outreach, and stewardship programs that would be implemented at all Backbone Sites under the Proposed Project.

CULTURAL RESOURCES

The HOSs would result in virtually no project-related development beyond the addition of signage, in contrast to the remaining Backbone Sites, which could have some development. Thus, the HOS Only Alternative would reduce the potential project impact to cultural resources associated with the implementation of the WT Plan in comparison to the Proposed Project. However, NMSB use would continue at existing non-HOS sites, and site owners/managers could still develop new facilities that could adversely affect cultural resources. Cumulative impacts on cultural resources would therefore remain the same under this Alternative as under the Proposed Project because the effects of development on cultural resources at non-HOSs would be very similar to or the same as for the Proposed Project, and permits would be required of any site owner/manager engaging in construction activities that could disturb cultural resources under any scenario.

HAZARDOUS MATERIALS

It is not known at this time if any of the Backbone Sites are impacted by contaminated soil, sediment, and/or groundwater. Because only HOSs are part of the project for the HOS Only Alternative, there would be virtually no project-related development or excavation at any of the sites. Potential impacts associated with hazardous materials would likely be lower under this Alternative than under the Proposed Project. Under this alternative, potential development of non-HOSs by owners/managers would be very similar to or the same as for the Proposed Project because of required compliance with applicable regulations pertaining to hazardous materials and contaminated soil and groundwater. Consequently, cumulative impacts of the HOS Only Alternative with other NMSB projects would remain the same as for the Proposed Project.

HYDROLOGY AND WATER QUALITY

Under the HOS Only Alternative, potential impacts to hydrology and water quality would be less than under the Proposed Project, because the HOSs would only require the addition of signage. There would be no disturbance of soil or sediment, and the quantity of run-off would remain the same because construction activities near the shore and the creation of impervious surfaces would be minimal or non-existent. Cumulative impacts of this Alternative with other development along the Bay shore would be the same as for the Proposed Project because owners/managers of non-HOSs would still have the potential to enhance or develop new facilities and these facilities could result in water quality impacts that would also require compliance with stormwater management regulations.

LAND USE PLANNING

Given the minimal improvements expected at HOSs as a result of WT Plan implementation, few, if any, conflicts with local land use plans or nearby land uses are likely. Most local land use plans for bayside jurisdictions and land management agencies support access to the Bay. The HOS Only Alternative, could, however, present a land use conflict at the regional and state level. This Alternative would conflict with the Bay Conservation and Development Commission's (BCDC's) Bay Plan policies to increase public access onto the Bay to the maximum extent feasible. It would also fall short of implementing the intent of the Water Trail Act, which set the geographic scope of the Water Trail to be within the jurisdiction of BCDC and to link access to the waters of San Francisco Bay. Such a conflict would not exist with the Proposed Project. Thus, the impact of this Alternative on land use planning would be greater than under the

Proposed Project. Cumulative impacts of this Alternative with other Bay shore development would be generally the same as for the Proposed Project because existing and new access sites could still be developed and used in the absence of the Water Trail.

TRANSPORTATION, CIRCULATION AND PARKING

The HOSs have existing parking facilities. Limiting the project to HOSs only under this HOS Only Alternative may result in increased parking demand over time because only this more limited set of sites would be actively publicized, leading to potentially higher use of HOSs. HOSs that have marginal or inadequate parking facilities, or have existing roadway or traffic hazards/constraints (e.g., railway crossing issues), would continue to have the same or greater impacts under this Alternative. Cumulative impacts on parking would likely be similar to the Proposed Project because the regional increase in NMSB use due to population growth and other demographic factors would be similar to that anticipated for the Proposed Project.

GREENHOUSE GASES AND CLIMATE CHANGE

Under the HOS Only Alternative, construction would be minimal, and would be limited to the installation of new signs. This would reduce the amount of GHG emissions associated with construction of the WT. Similarly, potential emissions due to vehicle trips from WT-related NMSB users going to WT-designated sites would be slightly less, because fewer sites would be part of the WT. Impacts on GHG emissions and climate change would be slightly less than under the Proposed Project. Cumulatively, potential effects of the HOS Only Alternative combined with other recreational development (including development at non-HOSs) and general population-driven growth of NMSB use would remain the same as cumulative impacts associated with the Proposed Project.

5.3.3 ALTERNATIVE 3: ENHANCED WATER TRAIL PLAN ALTERNATIVE

DESCRIPTION OF ALTERNATIVE 3

The Enhanced Water Trail Plan Alternative (Alternative 3) is designed to enhance the existing Draft WT Plan to further reduce potential impacts associated with implementation of the Plan. As described in Chapter 3 of this DEIR, the main potentially significant impacts potentially associated with implementation of the WT Plan include biological impacts, navigational safety impacts, and potential impacts to (conflicts with) other recreational uses at proposed WT trailheads. Under this Alternative, the existing Draft WT Plan would be modified to incorporate four additional strategies: Strategy 25, Comprehensive Education Program; Strategy 26, Navigational Safety; Strategy 27, Boatwashing Facilities; and Strategy 28, GHG Best Management Practices for Construction and Trailhead Operation. All mitigation measures identified in Chapter 3 that require revisions to existing strategies (mitigation measures Rec-M4A (Strategy 14), Bio M5 through Bio M8 (Strategies 17, 18, 19, and 21) and TPC-M2 (Strategy 8) would also be incorporated into the Enhanced WT Plan. Under this Alternative, the WT Plan would contain the same number of Backbone Sites, use the same process for trailhead designation, and also include Strategies 1 through 24 to avoid or help reduce potential impacts of WT Plan implementation. The proposed language for the new strategies is provided in Appendix H. All mitigation measures that would be implemented for the Proposed Project would also be implemented for this Alternative.

There would be no difference in the number of existing and planned Backbone Sites that would be included in the WT compared with the Proposed Project because the criteria for trailhead designation would remain the same. Similarly, the criteria for adding future sites would remain the same as with the Proposed Project. Consequently, the potential level of development and construction would be the same as for the Proposed Project. The primary difference between this Alternative and the Proposed Project is that the Enhanced Water Trail Plan would provide more detailed guidance regarding implementation, provide a comprehensive educational framework, would put greater emphasis on promoting navigational safety, directly address the potential spread of invasive species through NMSB use, and help further the goals of AB32 regarding GHG emissions. There is overlap between Strategies 25 and 26, in that improved education would enhance boater safety.

Strategy 25 would create an overall educational framework to support the various educational elements of the WT (signage, media, boater-to-boater education, stewardship, etc.). This comprehensive educational framework would include identification of available resources, and development of a centralized resource for up-to-date information on various WT-related topics. By creating a comprehensive educational framework, specific topics, such as appropriate buffer distances for sensitive species, would be clearly and consistently communicated across a wide range of educational media and activities.

Strategy 26 would build on existing information, education, outreach, and coordination efforts to enhance navigational safety by creating a focus on NMSB-specific safety education needs for San Francisco Bay. Safety training is currently conducted on an *ad hoc* basis by boating clubs, outfitters, tour operators, and instructional facilities. Strategy 26 calls for development of comprehensive safety education guidelines and basic information, drawing on existing, reliable sources of guidance such as Cal Boating and the U.S. Coast Guard. These guidelines and the identified basic information would help ensure that safety training provided by various organizations would meet a minimum standard. An accompanying train-the-trainer program would be enacted if feasible to provide a deeper level of knowledge to those who provide safety training. By providing a centralized forum for safety-related information, updated safety information can be provided more easily to those who provide safety education.

Strategy 26 also calls for safety-related signage, development of a WT “safety ethic” as part of the overall WT ethic, and an increased emphasis on promptly reporting incidents to provide an improved understanding of the causes of various types of incidents, and allow long-term improvement in navigational safety for NMSBs. Sharing information regarding accidents and their causes would help boaters understand the potential implications of their actions. Other efforts to improve navigational safety would include improved facility design, and education regarding the Rules of the Road, regulated navigation areas, and security zones.

Strategy 27 would encourage site owners/managers to provide boat and gear washing opportunities at their trailheads. Boat and gear washing facilities would help reduce the potential for spread of invasive plants by reducing the likelihood that seeds are carried from one location to another. Boat and gear washing facilities would be designed to comply with any permit requirements, and would be particularly encouraged in areas that are known to contain large populations of invasive plants.

Strategy 28 calls for the inclusion of measures (best management practices) to reduce GHG emissions in the design and construction of any new facilities constructed using SCC funding; WT staff and PMT efforts to encourage site owners/managers to implement a similar approach; and for the incorporation of climate change awareness and carbon footprint reduction strategies into WT educational materials. Strategy 28 will help reduce the emissions attributable to the implementation of the WT project and help further the goals of AB32.

EVALUATION OF IMPACTS

RECREATION

Alternative 3 would provide the same recreational benefits and have the same impacts to recreation as the Proposed Project because the quantity and types of facilities provided would be the same. While it is possible that improved safety training and information could create a minimal increase in WT users by elevating their confidence level, this increase would not be expected to create added impacts to recreational resources. Similarly, there would be no or minimal change to cumulative recreational impacts.

NAVIGATIONAL SAFETY

The Enhanced WT Plan Alternative would improve navigational safety relative to the Proposed Project, beyond the level provided by the mitigations proposed in Section 3.4, because safety education would be more systematic, and likely more comprehensive, than what would be available with the Proposed Project. In addition, through targeted signage (and possibly other efforts such as warning buoys) safety information would be made available where it is most important and effective – at the trailhead and on the water. Strategy 26 also includes an emphasis on encouraging boaters to report incidents, and a mechanism for modifying safety information in response to the information gained from incident reports.

American Whitewater and the American Canoe Associations have similar recommendations for improving NMSB safety. They are to 1) provide better reporting of accidents, 2) improve coordination between paddle interest groups and government agencies, and 3) increase education efforts. American Whitewater found that many deaths were preventable by using simple precautions: 1) wearing PFDs, 2) better assessing water conditions, and 3) using proper (warm/waterproof) clothing. Other factors influencing boater safety include lack of adequate skills, lack of adequate equipment, lack of adequate information (pertaining to weather and/or water conditions), lack of knowledge of boating or equipment, and poor judgment. All of these factors could be ameliorated to some degree by an education program that stresses the need for proper preparation, training, and equipment, and provides information or links to information about weather and water conditions.

The potential value of additional safety education and an increased emphasis on safe boating is supported by both USCG and Cal Boating surveys. The USCG conducts annual wear surveys for PFDs; the survey includes eight sites in California. The 2005 national data showed that 74% of adult kayakers were wearing PFDs, but only 15% of canoeists. The 2002 National Recreational Boating Survey (Cal Boating 2009) California data indicate that only 72.3% of California kayakers wear PFDs all the time; the numbers for canoeists (65.6%), row boat users (40%) and

sail boat users (36.4%) are all lower. The percentage of respondents who said that they never wear a PFD ranged from 3.1% for kayakers to 36.4% for sailboat users.

Locally, 61% of experienced NMSB users and 75% of commercial/institutional survey respondents indicated that inexperienced/unprepared boaters presented a significant safety concern. This was the top concern for commercial/institutional respondents, and second only to interactions with motorized vessels for experienced NMSB users (Cal Boating 2009).

A safety program that emphasizes PFD use, adequate preparation, knowledge of the Rules of the Road, and understanding one's capabilities would reduce the potential for accidents on the water. Under Alternative 3, potential impacts to navigational safety would be less than for the Proposed Project, and cumulative impacts would similarly be less than for the Proposed Project.

PUBLIC SERVICES

The need for public services (such as police or ranger patrols) at trailheads would be the same as or very slightly less than the Proposed Project. Improved safety education may lead to a slight reduction in the need of emergency services relative to the Proposed Project. The cumulative impact to public services would also be the same or very slightly less under the Enhanced Water Trail Plan Alternative than the Proposed Project.

AESTHETICS

The approach to evaluating and developing potential trailheads would be the same as for the Proposed Project, and the number and location of potential sites would be identical to the Proposed Project. Consequently, the potential project-specific and cumulative impacts to aesthetics associated with Alternative 3 are the same as for the Proposed Project.

BIOLOGICAL RESOURCES – VEGETATION

Potential impacts to sensitive habitats, special status plants, and the potential for spread of invasive vegetation would be slightly lower under Alternative 3 than for the Proposed Project. Implementation of Strategy 25 may lead to a higher success rate in motivating WT users to avoid sensitive habitats and special status plants and to comply with boat-washing guidelines. Increased availability of boat washing facilities (Strategy 27) would facilitate compliance with boat washing recommendations, which would help to reduce the potential impact associated with the spread of invasive species. Improved knowledge about safe boating practices as provided through Strategy 26 may decrease emergency landings in locations other than designated destinations and launches. . The addition of Strategies 25 through 27 would slightly reduce the potential project-related and cumulative impacts to vegetation of Alternative 3 compared with the Proposed Project.

BIOLOGICAL RESOURCES – BIRDS

Rafting Waterbirds, Nesting Waterbirds (Including Sensitive Species), and Tidal Marsh Birds

Under Alternative 3 there would be the same number of trailheads in the same locations as the Proposed Project. The goal of Strategy #25 is to lead to even better dissemination of educational information, including information pertaining to the protection of sensitive and listed species. Implementation of Strategy 25 may lead to a slightly higher success rate in motivating WT users

to avoid rafting birds and to recognize when birds are alerting than under the Proposed Project. Potential project-related impacts would therefore be potentially slightly less than for the Proposed Project, and cumulative impacts would also be slightly less.

Tidal-flat Specialists (Shorebirds)

As with the Proposed Project, this Alternative would result in no significant disturbance to shorebirds. Therefore, there would be no difference in impacts between this Alternative and the Proposed Project; cumulative impacts would also be the same.

BIOLOGICAL RESOURCES – OTHER WILDLIFE

Seals

Alternative 3 would include the same number of trailheads in the same locations and with the same level of improvements as the Proposed Project. Use of any of these trailheads by WT users could potentially result in the disturbance to harbor seals at haul-outs by boaters, and contribute to avoidance or abandonment of traditional haul-out sites due to project and cumulative increased use of the Bay by NMSBs. Implementation of Strategy 25 may lead to a slightly higher success rate in motivating WT users to avoid seal haul-out sites and to recognize when seals are registering alarm. Potential project-related impacts would therefore be potentially slightly less than for the Proposed Project, and cumulative impacts would also be slightly less.

Other Marsh-Dependent Sensitive Species

Potential impacts to other marsh-dependent sensitive species would be almost the same as for the Proposed Project. Implementation of Strategy 25 may lead to a slightly higher success rate in motivating WT users to avoid sensitive habitats and disturbance to marsh-dependent species, and thereby slightly reduce potential project and cumulative impacts to these species.

CULTURAL RESOURCES

The level of development at the existing, planned and potential future sites would be the same as for the Proposed Project. Thus development under Alternative 3 has the same potential to affect buried cultural resources as the Proposed Project. Similarly, cumulative impacts would remain the same.

HAZARDOUS MATERIALS

For the Enhanced Water Trail Plan Alternative, WT trailheads would be located in the same locations as for the Proposed Project, and would thus have the same likelihood of encountering contamination during development of new (planned) access sites or during major facility improvements. Therefore, potential hazardous materials impacts of Alternative 3 would be the same as for the Proposed Project, and potential cumulative impacts would be the same as well.

HYDROLOGY AND WATER QUALITY

The level of construction and development, including impervious surfaces at trailheads around the Bay would be the same for the Enhanced Water Trail Alternative as for the Proposed Project. Strategy 27 would encourage the inclusion of boat rinsing facilities at trailheads. The use of these stations would not adversely affect water quality because only fresh water would be used. Potential impacts associated with Alternative 3 would therefore be the same as for the Proposed Project. Cumulative impacts would also be the same.

LAND USE PLANNING

Most local land use plans for bayside jurisdictions and land management agencies support access to the Bay. As mentioned above, Alternative 3 would result in the same level of development at WT trailheads as the Proposed Project, and would therefore have the same types and level of potential impacts. Similarly, potential cumulative impacts to land use would also be similar and remain less than significant.

TRANSPORTATION, CIRCULATION AND PARKING

Demands for parking would be the same for the Enhanced Water Trail Plan Alternative as for the Proposed Project, because the level of development would be the same for both. Modified Strategy 8 (incorporating mitigation measure TCP-M2) would ensure that parking at all WT trailheads is provided in accordance with the anticipated need and consistent with local jurisdiction requirements. Project-specific and cumulative impacts would be the same for Alternative 3as for the Proposed Project.

GREENHOUSE GASES AND CLIMATE CHANGE

Under Alternative 3, the same level of proposed construction of new facilities and facility improvements would occur as for the Proposed Project. Growth in NMSB use and associated vehicle use would also be the same. Strategy 28 would encourage reduction in construction and operational GHG emissions through design, construction practices, and education. Consequently, potential GHG emissions for the Enhanced Water Trail Alternative are expected to be slightly lower than GHG emissions under the Proposed Project. Cumulatively, potential generation of GHG for Alternative 3 would be slightly lower than the Proposed Project and potential cumulative impacts would remain less than significant.

5.4 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA Guidelines (Section 15126.6(a) and (e)(2)) require that an EIR’s analysis of alternatives identify the “environmentally superior alternative” among all of those considered. In addition, if the No Project Alternative is identified as environmentally superior, then the EIR also must identify the environmentally superior alternative among the other alternatives. Under CEQA, the goal of identifying the environmentally superior alternative is to assist decision makers in considering project approval. CEQA does not, however, require an agency to select the environmentally superior alternative, nor to consider the feasibility of environmentally superior project alternatives identified in the EIR if described mitigation measures will reduce environmental impacts of the approved project to acceptable (less than significant) levels. (*Laurel Heights Improvement Association of San Francisco v. Regents of the University of California*, 47 Cal.3d 376, 400-3 (1988); *Laurel Hills Homeowners Association v. City Council* 83 Cal. App. 3d 515 (1978), CEQA Guidelines Sections 15042–15043). Given that the Proposed Project, as mitigated, avoids or reduces to less than significant levels all potential impacts, the lead agency may elect to adopt the Proposed Project, incorporating all mitigation measures.

Based on the above analysis, the Enhanced Water Trail Plan Alternative would be the environmentally superior alternative. This alternative would provide, at a minimum, the same level of protection (impact reduction) as the Proposed Project for all resources. Potential impacts to all resources would remain less than significant. The increased emphasis on safety would reduce the potential navigational safety impacts associated with increased NMSB use of the Bay,

relative to the Proposed Project. The improved sharing of information about incidents would provide further opportunities for enhancing NMSB safety on the Bay by helping project proponents and NMSB users become aware of potential safety concerns. The comprehensive educational framework would improve the effectiveness of the various educational and outreach initiatives included in the Proposed Project, and therefore potentially further reduce potential impacts to biological resources. The increased number of boat washing facilities promoted by Strategy 27 would help reduce the potential for spread of invasive plants. Finally the greater emphasis on GHG reductions would result in a small decrease in construction and operational emissions of GHGs compared to the Proposed Project.

6. REPORT PREPARERS, REFERENCES AND DEFINITIONS

6.0 REPORT PREPARERS, REFERENCES AND GLOSSARY

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6.2 REFERENCES AND PERSONS CONTACTED

2M. 2009. Memorandum from Patrick Miller, 2M Associates to Richard Grasetti, Grasetti Environmental Consulting: Bay Water Trail – Average Kayak Travel Distances – Opinion Poll. July 23.

Accurso, L.M. 1992. Distribution and abundance of wintering waterfowl on San Francisco Bay: 1988-1990. MS thesis. Humboldt State University. May, 1992.

Ainley, D.G. 2000. Double-crested Cormorant. Pp 322-324 in Goals Project 2000 (q.v.).

Ackerman, J.T., J.Y. Takekawa, K.L. Kruse, D.L. Orthmeyer, J.L. Yee, C.R. Ely, D.H. Ward, K.S. Bollinger, and D.M. Mulcahy. 2004. Using radiotelemetry to monitor cardiac response of free-living tule greater white fronted geese (*Anser albifrons elgasi*) to human disturbance. *Wilson Bulletin* 116(2):146-151.

Ackerman, J.T., C. Eagles-Smith, G.S., S. Wainwright-DeLaCruz, J.Y. Takekawa, T. Adlesbach, K. Miles, D. Hoffman, S. Schwarzbach, T. Suchanek, and T. Maurer. 2007. Mercury in Birds of the San Francisco Bay-Delta: Trophic Pathways, Bioaccumulation, and Exotoxicological Risk to Avian Reproduction. 2006 Annual Administrative Report. Prepared for California Bay-Delta Authority, U.S. Fish and Wildlife Service, Department of Fish and Game, and U.S. Geological Survey. Davis, California 2007. 44p.

Ackerman, J.T., C.A. Eagles-Smith, J.Y. Takekawa, J. Bluso-Demers, D. Tsao, and D. Le Fer. 2009. California Gull Movements in Relation to Nesting Waterbirds and Landfills: Implications for the South Bay Salt Pond Restoration Project. Data Summary, U.S. Geological Survey, Western Ecological Research Center, Davis, CA 64 pp.

Albertson, J. and J. Evens. 2000. California Clapper Rail, Species Narrative. Chapter 7 in Baylands Ecosystem Species and Community Profiles. San Francisco Bay Estuary Habitat Goals Report.

Allen, S.G. 1991. Harbor seal habitat restoration at Strawberry Spit, San Francisco Bay. Report to the Marine Mammal Commission, Contract No. MM2910890-9, March 1991. 43 p.

Allen, S.G., Ainley, D.G., Page, G.W. and Ribic, C.A. 1984. The effect of disturbance on harbor seal haul out patterns at Bolinas Lagoon, California. *Fishery Bulletin* 82(3): 493-500.

Association of Bay Area Governments (ABAG). 1989. *Bay Trail Plan*.

----- . 2009. Regional Population Projections.
<http://www.abag.ca.gov/planning/currentfest/regional.html> (accessed 12/6/09)

Avocet Research Associates. 2007. North Basin Waterbird Study, Eastshore State Park, Alameda, California: 2004-2007. Draft final report to State of California Department of Parks and Recreation. 1 November 2007.

----- . 2008. Protocol Surveys for California Clapper Rail (*Rallus longirostris obsoletus*) at Western Stege Marsh, Richmond Field Station: the 2008 Nesting Season. Final Report to Tetra Tech EM, Inc., San Francisco, CA. Final Report from Avocet Research Associates, Point Reyes Station CA. May 27, 2008.

Bairlein F. & Hüppop O. 2004. Migratory fuelling and global climate change. In: Møller, A., Berthold, P. & Fiedler, W (Eds) *Birds and Climate Change*, pp. 33. *Advances in Ecological Research* 35. Elsevier Academic Press.

Barad, M., Kamman, R., Battalio, R., Harvey, J.T., Eguchi, J.T. 1998. Corte Madera Ecological Reserve harbor seal habitat protection study. Unpublished report, PWA Ref# 1170. Phillip Williams and Associates, 770 Tamalpais Drive, Suite 401, Corte Madera, CA 94925. 29 pp.

Batten, L.A. 1977. Sailing on reservoirs and the effects on waterbirds. *Biological Conservation* 11:49-58.

Bay Area Air Quality Management District (BAAQMD). 2009. *California Environmental Quality Act Guidelines Update: Proposed Thresholds of Significance*.

----- . 2010. Source Inventory of Bay Area Greenhouse Gas Emissions: Base Year 2007.

Baye, P.R., P.M. Faber, and B. Grewell. 2000. Tidal marsh plants of the San Francisco Estuary. in: Olofson, P.R., ed. 2000. *Baylands Ecosystem Species and Community Profiles: life histories and environmental requirements of key plants, fish, and wildlife*. Goals Project (Baylands Ecosystem Habitat Goals), San Francisco Bay Regional Water Quality Control Board, Oakland, California.

Baye, P.B. 2000. Plants and environments of diked baylands. Pp. 33-42 in: Olofson, P.R., ed. 2000. *Baylands Ecosystem Species and Community Profiles: life histories and environmental requirements of key plants, fish, and wildlife*. Goals Project (Baylands Ecosystem Habitat Goals), San Francisco Bay Regional Water Quality Control Board, Oakland, California.

Belant, J. L. 1997. Gulls in urban environments: landscape-level management to reduce conflict. *Landscape and Urban Planning* 38:245-258.

Bigg, M.A. 1981. Harbour seal, *Phoca vitulina* and *Phoca largha*. pp. 1-28 in S.H. Ridgway and R.J. Harrison (eds.), *Handbook of Marine Mammals*. New York: Academic Press.

Bildstein, K.L., G.T. Bancroft, P.J. Dugan, D.H. Gordon, R.M. Erwin, E. Nol, L.X. Payne, and S.E. Senner. 1991. Approaches to the conservation of coastal wetlands in the Western Hemisphere. *Wilson bulletin* 103:218-254.

Blankinship, T. 1999. *State Wildlife Areas – Valuable places for wildlife and visitors*. Outdoor California. Vol: 60, No. 1. January-February 1999.

Blumstein, D.T. 2003. Flight-Initiation Distance in Birds Is Dependent on Intruder Starting Distance. *The Journal of Wildlife Management*, Vol. 67, No. 4 (Oct., 2003), pp. 852-857

Bohorquez, A.S., Galloway, M.J., Green, D.E., Grigg, E.K., Allen, S.G., and Markowitz, H. 2000. Differential response of Pacific harbor seals (*Phoca vitulina richardsi*) towards kayaks compared to other watercraft. Animal Behavior Society Annual Conference, Atlanta, GA. August.

Bollman, F. H., P. K. Thelin, and R. T. Forester. 1970. Bimonthly bird counts at selected observation points around San Francisco Bay, February 1964 to January 1966. *Calif. Fish and Game* 56:224-239.

Bonner, W.N., Vaughan, R.W. and Johnston, L. 1973. The status of common seals in Shetland. *Biological Conservation* 5: 185-190.

Bossard, C.C. J.M. Randall, and M.C. Hoshovsky. 2000. *Invasive Plants of California's Wildlands*. University of California Press.

Bossard, C.C. and J.M. Randall. 2007. Nonnative plants of California. Pp. 107-123 in: Barbour, M.G., T. Keeler-Wolf, and A. Shoenherr, eds. 2007. *Terrestrial Vegetation of California*, 3rd Edition. University of California Press.

Boyle, S.A. and F.B. Samson. 1985. Effects of nonconsumptive recreation on wildlife. A review. *Wildlife Society Bulletin* 13:110-116

Brasseur, S., J. Creuwels, B. Werf and P. Reijnders. 1996. Deprivation indicates necessity for haul-out in harbor seals. *Marine Mammal Science* 12(4):619-624

Britton, E. E. 1982. Least Tern management by protection of nesting habitat. *Trans. Northeastern Section Wildl. Soc.* 39: 87–92.

Brown, R.F. and B.R. Mate. 1983. Abundance, movements and feeding habits of harbor seals, *Phoca vitulina*, at Netarts and Tillamook Bays, Oregon. *Fisheries Bulletin* 81: 291-301

Burger, J. 1981. The effects of human activity on birds at a coastal bay. *Biological Conservation* 21:231-241.

Burger, J. 1983. Jamaica Bay Studies IV. Factors affecting distribution of Greater Scaup *Aythya marila* in a coastal estuary in New York, USA. *Ornis Scandinavica* 14:309-316.

Burger, J. 1991. The effects of human activity on birds at a coastal bay. *Biological Conservation* 21:231-241.

Burger, J., and Gochfeld, M. 1983. Behavioural responses to human intruders of herring gulls (*Larus argentatus*) and great black-backed gulls (*L. marinus*) with varying exposure to human disturbance. *Behavioural Processes* 8, 327–344.

Burger, J., and M. Gochfeld. 1991. Human activity influence and diurnal and nocturnal foraging of sanderlings (*CALIDRIS ALBA*). *Condor* 93:259-265

Butler, R.W. 1992. Great Blue Heron (*Ardea herodias*), *The Birds of North America Online* (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the *Birds of North America Online*: <http://bna.birds.cornell.edu/bna/species/025>

Calambokidis, J., Steiger, G.H., Evans, J.R., Jeffries, S.J. 1991. Censuses and disturbance of harbor seals at Woodard Bay and recommendations for protection. Final report to Washington Department of Natural Resources, Olympia, WA. 44 p.

California Air Resources Board (CARB). 2008. Climate Change Proposed Scoping Plan. October, 2008.

----- . 2010. California GHG Emissions: <http://www.arb.ca.gov/cc/inventory/data/data.htm> (Accessed April 1, 2010.)

California Climate Change Center (CCCC). 2006. *Our Changing Climate – Assessing the Risks to California*. http://www.climatechange.ca.gov/biennial_reports/2006report/index.html (accessed August 2006)

California Department of Boating and Waterways (Cal Boating). 2002. Statewide Boaters and Boating Facilities – California Boating Facilities Needs Assessment. October 15.

----- . 2009. Draft: Non-Motorized Boating in California. March.

----- . 2010. Federal Restrictions in the Wake of the September 11 Terrorist Attacks. October 1, 2001. <http://www.dbw.ca.gov/PressRoom/2001/011001Terror.aspx> (accessed June 29, 2010)
California Department of Toxic Substances Control (DTSC). 2009. Unofficial California Code of Regulations (CCR), Title 22, Division 4.5:
<http://www.dtsc.ca.gov/LawsRegsPolicies/Title22/index.cfm> (accessed December 6, 2009)

California Department of Transportation (CalTrans). 2008. Visual Impact Assessment of the Proposed Operational Improvements on Highway 101 in Carpinteria. July 2008.

----- . 2009. California Scenic Highway Mapping System (updated 12-07-2007):
http://www.dot.ca.gov/hq/LandArch/scenic_highways/ (accessed December 6, 2009).

California Environmental Protection Agency (CalEPA). 2009. The History of the California Environmental Protection Agency: <http://www.calepa.ca.gov/about/History01/dtsc.htm> (accessed December 6, 2009)

----- . 2006. *Inventory of California Greenhouse Gas Emissions and Sinks: 1990-2004*.

California Department of Fish and Game (CDFG). 1989. List of the state and Federal endangered and threatened animals of California. California Dept. Fish and Game, Sacramento.

----- . 1995. Staff report on burrowing owl mitigation. 8 pp.

----- . 2006a. *Mission Statement*. Retrieved on March 8, 2006 from the Department of Fish and Game website: <http://www.dfg.ca.gov/html/dfgmiss.html>

----- . 2006b. *Definitions. Marine Life Protection Act Initiative*. Retrieved May 4, 2006 from: <http://www.dfg.ca.gov/MRD/MLPA/defs.html>

----- . 2007. Special Animals (848 taxa), biogeographic Data Branch California Natural Diversity Data Base. October 2007.

<http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPAnimals.pdf>

----- . 2009a. Special Animals (901 Taxa). March 2009.

<http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/spanimals.pdf>

----- . 2009b. Introduction to the MLPA. <http://www.dfg.ca.gov/mlpa/background.asp> (accessed 8/18/09)

----- . 2009c. About the California Department of Fish and Game. www.dfg.ca.gov/about. Accessed 10/22/09.

California Department of Parks and Recreation (State Parks). 1978. *Angel Island General Development Plan*, May 1978. Available online at

<http://www.parks.ca.gov/pages/21299/files/231.pdf>

----- . 1987. *Candlestick Point State Recreation Area General Plan*, November 1978, amended May 1987. Available online at

http://www.parks.ca.gov/pages/21299/files/214_1candlestick.pdf

----- . 1979. *China Camp General Plan*, February 1979. Available online at

<http://www.parks.ca.gov/pages/21299/files/202.pdf>

----- . 1996. *Angel Island State Park. General Development Plan Expanded Tram Service Amendment. Preliminary*. March 1996. Available online at

http://www.parks.ca.gov/pages/21299/files/ar_231_364.pdf

----- . 2002a. *Eastshore State Park General Plan*. December 2002. Available online at <http://www.parks.ca.gov/pages/21299/files/eastshorestatepark-generalplan.pdf>

----- . 2002b. *State Parks System Plan. Part I: A System for the Future*. Available online at http://www.parks.ca.gov/?page_id=24512

----- . 2002c. *State Parks System Plan. Part II: Initiatives for Action*. Available online at http://www.parks.ca.gov/?page_id=24512

----- . 2003. *Public Opinions and Attitude - Outdoor Recreation in California: California Outdoor Recreation Plan*. December, 2003.

----- . 2004. Retrieved on March 9, 2006 from the CA State Parks website: http://www.parks.ca.gov/?page_id=91

----- . 2009a. Statewide Trails Program and Planning. (http://www.parks.ca.gov/?page_id=1324. (accessed 8/21/09))

----- . 2009b. California Recreational Trails Plan. http://www.parks.ca.gov/?page_id=23443. (accessed 12/13/09)

California Native Plant Society (CNPS). 2001. *Inventory of Rare and Endangered Plants of California*. 6th ed. Rare Plant Scientific Advisory Committee, David P. Tibor, Convening Editor. California Native Plant Society. Sacramento, CA. 388 pp.

California State Coastal Conservancy (SCC). 2007. *San Francisco Bay Water Trail Plan* (2007).

Carney, K.M., and W. Sydeman. 1999. A review of human disturbance effects on colonial waterbirds. *Colonial Waterbirds* 22(1): 68-79.

Carter, Woody. 2004. Oregon Statewide Trail User and Non-Motorized Boat User Survey. Final Report for the Oregon Parks and Recreation Department.

Center for Collaborative Policy, California State University, Sacramento (CCP). 2008. [San Francisco Bay Area Water Trail Education, Outreach & Stewardship Program Draft for PMT Review](#). October 14, 2008.

City of Sausalito. 2008. In the Loop - Accidental Release of Sewage. <http://www.ci.sausalito.ca.us/index.aspx?recordid=153&page=18>. Posted 2/1/2008

Conomy, J.T., J.A. Dubovsky, J.A. Collazo, and W.J. Fleming. 1998. Do Black Ducks Habituate to Aircraft Disturbance. *J. wildl. Management* 62(3):1135-1142.

Conomos, T., Smith, R., Peterson, D., Hager, S. and Schemel, L. 1979. *Processes affecting seasonal distributions of water properties in the San Francisco Bay estuarine system*. In: T. Conomos (ed.), *San Francisco Bay – the Urbanized Estuary*. Pacific Division/ American Association for the Advancement of Science, San Francisco, CA. 121-141.

Contra Costa County (CCC). 2008. Contra Costa County Grand Jury Report No. 0808 *Aquatic Junkyards Exist in Contra Costa County 2007-2008*.

Cooke, A.S. 1980. Observations on how close certain passerine species will tolerate an approaching human in rural and suburban areas. *Biological Conservation* 18, 85–88.

Cronan, J.M. 1957. Food and feeding habits of the scaups in Connecticut waters. *Auk* 74(4):459-468.

Cywinski, K. 2004. The effects of motorized watercraft on waterfowl. *Summer Solstice* 9 (2). Online: <http://www.wildlandscpr.org/node/210>

Davidson, N.C. and P.I. Rothwell. 1993. Disturbance to Waterfowl on Estuaries: the Conservation and Coastal management Implications of Current Knowledge. *Wader Study Group Bull.* 68:97-105

Department of Environment, Food and Rural Affairs (DEFRA). 2005. Climate change and migratory species. A report by the British Trust for Ornithology. Available at: <http://www.defra.gov.uk/wildlife-countryside/resprog/findings/climatechange-migratory/index.htm>.

East Bay Regional Park District (EBRPD). 1997. *Master Plan 1997*. Adopted December 17, 1996. Available online at http://www.ebparks.org/files/RPM_Plan97.pdf

----- . 2007. *Master Plan Map. Draft 10/29/2007*. Available online at http://www.ebparks.org/planning/mp/2007_map. Accessed January 10, 2008.

EDAW, Philip Williams and Assoc., H.T. Harvey and Assoc., Brown and Caldwell, Geomatrix et al. 2007. *South Bay Salt Pond Restoration Project. Final Environmental Impact Statement/Report*. Prepared for U.S. Fish and Wildlife Service, San Francisco Bay National Wildlife Complex (Newark, CA) and California Department of Fish and Game (Yountville CA). December 2007.

Evens, J.G. and Page. G.W. 1986. Predation on black rails during high tides in salt marshes. *Condor* 88: 107-109.

Evens, J. and Nur. N. 2002. California Black Rails in the San Francisco Bay Region: Spatial and Temporal Variation in Distribution and Abundance. *Bird Populations* 6:1-12.

- Evens, J., G.W. Page, L.E. Stenzel, S.A. Laymon, and R.W. Stallcup. 1991. Distribution, Relative Abundance, and Status of the California Black Rail in Western North America. *The Condor*, Vol. 93, No. 4 (Nov., 1991), pp. 952-966.
- Feeney, L. 2000. California Least Tern. in Goals Project 2000. Pp. 359-362.
- Fitzpatrick, S. and Bouchez, B. 1998. Effects of recreational disturbance on foraging behaviour of waders on a rocky beach. *Bird Study* 45:157-171.
- Flynn, E., Press, D., Codde, S., Roberts, D. and Allen, S. (2009) Pacific harbor seal (*Phoca vitulina richardii*) monitoring at Point Reyes National Seashore and Golden Gate National Recreation Area: 2008 Annual Report. National Park Service Natural Resource Technical Report NPS/SFAN/NRTR-2009/267. 24 p.
- Fraser, M.W. 1987. Reactions of sea-ducks to windsurfers *British Birds* 80:424.
- Frid, A. and Dill, L.M. 2002. Human-caused disturbance stimuli as a form of predation risk. *Conservation Ecology* 6(1): 11. [online] URL: <http://www.consecol.org/vol6/iss1/art11/>
- Galbraith, H., Jones, R. Park, R. Clough, J., Herrod-Julius, S. Harrington, B. and Page, G. 2005. Global climate change and sea level rise: potential losses of intertidal habitat for shorebirds. *Waterbirds* 25(2):173-183.
- Galicia, E. and Baldassarre, G. 1997. Effects of motorized tourboats on the behavior of non-breeding American flamingos in Yucatan, Mexico. *Conservation Biology* 11(5):1159-1165.
- Goals Project. 1999. *Baylands Ecosystem Habitat Goals. A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project*. First Reprint. U.S. Environmental Protection Agency, San Francisco, Calif./S.F. Bay Regional Water Quality Control Board, Oakland, Calif.
- . 2000. *Baylands Ecosystem Species and Community Profiles: Life histories and environmental requirements of key plants, fish, and wildlife. Prepared for the San Francisco Bay Area Wetlands Ecosystem Goals Project*. P.R. Olofson, editor. San Francisco Bay Regional Water Quality Control Board, Oakland, California.
- Governor's Office of Planning and Research (OPR). 2009. CEQA Guidelines and Greenhouse Gases. <http://www.opr.ca.gov/index.php?a=ceqa/index.html>. (accessed 10/12/09)
- Green, D.E., Grigg, E.K., Allen, S.G. and Markowitz, H. 2006. Monitoring the potential impact of the seismic retrofit construction activities at the Richmond San Rafael Bridge on harbor seals (*Phoca vitulina*): May 1, 1998 – September 15, 2005. Final Report to the California Department of Transportation, Contract 04A0628.

- Grigg, E.K. 2008. Environmental predictors of habitat use patterns of Pacific harbor seals (*Phoca vitulina richardii*) in an urbanized estuary. Ph.D. Dissertation. University of California, Davis, CA. 126 p.
- Grigg, E.K., Allen, S.G., Green, D.E., and Markowitz, H. 2004. Harbor seal (*Phoca vitulina*) population trends in the San Francisco Bay estuary, 1970-2002. California Fish and Game 90(2): 51-70.
- Gutzwiller, K.J. and Marcum, M.A. 1993. Avian responses to observer clothing color: caveats from winter point counts. Wilson Bulletin 105:628-636.
- Gutzwiller, K.J., Wiedenmann, R.T., Clements, K.L., Anderson, S.H. 1994. Effects of human intrusion on song occurrence and singing consistency in sub-alpine birds. Auk 111(1): 28-37.
- Gutzwiller, K.J., Marcum, H.A., Harvey, H.B., Roth, J.D., and Anderson, S.H. 1998. Bird tolerance to human intrusion in Wyoming montane forests. Condor. 100: 519–527.
- Hanan, D. 1996. Dynamics of abundance and distribution for Pacific harbor seal (*Phoca vitulina richardsi*) on the coast of California. Ph.D. dissertation, University of California, Los Angeles. 158 p.
- Harbor Safety Commission of the San Francisco Bay (HSC). 2009. San Francisco, San Pablo, and Suisun Bay Harbor Safety Plan. Approved March 12, 2009.
- Harkonen, T.J. 1987. Influence of feeding on haul out patterns and sizes of sub-populations in harbour seals. Netherlands Journal of Sea Research 21(4): 331-339.
- Harrington, B. and Perry, E. 1995. Important shorebird staging sites meeting Western Hemisphere shorebird Reserve Network criteria in the United States. U.S.F.W.S. report 121 pp.
- Harris, L.D. 1988. The nature of cumulative impacts on biotic diversity of wetland vertebrates. Environmental Management 12:675-693.
- Henry E. and Hammill M. 2001. Impact of small boats on the haul out activity of harbour seals (*Phoca vitulina*) in Metis Bay, St Lawrence Estuary, Quebec. CAN. Aquatic Mammals 27:140-148
- Hickman, J.E., ed. 1993. *The Jepson Manual: Higher Plants of California*. University of California Press. Berkeley and Los Angeles, CA. 1400 pp.
- Holman & Associates. 2007. Letter Report "Re: Bay Water Trail - Potential for Archaeological Resources", prepared for Richard Grassetti, Grassetti Environmental Consulting. October 4.
- Holstein, Glen. 2000. Plant communities ecotonal to the baylands. In: Olofson, P.R., ed. 2000. *Baylands Ecosystem Species and Community Profiles: life histories and environmental*

requirements of key plants, fish, and wildlife. Goals Project (Baylands Ecosystem Habitat Goals), San Francisco Bay Regional Water Quality Control Board, Oakland, California.

Huiskes, A.H.L., B.P. Koutstaal, P.M.J. Herman, W.G. Beeftink, M.M. Markusse and W. DeMunck. 1995. Seed dispersal in halophytes in tidal salt marshes. *Journal of Ecology* 83: 559-567.

Hume, R. A. 1976. Reactions of goldeneyes to boating. *British Birds* 69:178-179.

Ikuta, L.A. and D.T. Blumstein. 2003. Do fences protect birds from human disturbance? *Biological Conservation* 112:447-452.

Intergovernmental Panel on Climate Change (IPCC). 2007. *Climate Change 2007: The Physical Basis—Summary for Policymakers*. <http://www.ipcc.ch/SPM2feb07.pdf>. Accessed February 2008.

International Bird Rescue Research Center (IBRRC). 2008. Dark days on San Francisco Bay (report on Cosco Busan oil spill). Online at http://www.ibrrc.org/Cosco_Busan_spill_2007.html. Retrieved May 22, 2008.

Invasive Spartina Project (ISP). 2001. Initial Study. San Francisco Estuary Invasive Spartina Project. Online at http://www.spartina.org/project_documents/final_i_s.pdf.

Jaques, D. L. and D. W. Anderson. 1994. Brown Pelican use of the Moss Landing Wildlife Management Area. Roosting behavior, habitat use, and interactions with humans. Report by the State of California Department of Fish and Game Wildlife Management Division, July 1988. In D. L. Jaques. 1994. Range expansion and roosting ecology of non-breeding California Brown Pelicans. Master's thesis, Univ. of California, Davis.

Jaques, D. L., C. S. Strong and T. W. Keeney. 1996. Brown Pelican roosting patterns and responses to disturbance at Mugu Lagoon and other nonbreeding sites in the Southern California Bight. Tech. Rep. no. 54. Cooperative Parks Studies Unit, Univ. of Arizona, Tucson.

Jones, P.A. 1986. Aspects of the reproductive biology of the California Gull in Alviso, California. M.A. Thesis, San Francisco State Univ., San Francisco, Calif.

Johnson, A. and Acevedo-Gutierrez, A. 2007. Regulation compliance by vessels and disturbance of harbour seals (*Phoca vitulina*). *Canadian Journal of Zoology* 85: 290-294.

Johnson, B.W. 1977. The effects of disturbance on a population of harbor seals. Appendix 1 from: K. Pitcher and D. Calkins, *Biology of the harbor seal, Phoca vitulina richardsi*, in the Gulf of Alaska. In: Annual Reports, Environmental Assessment of the Alaskan Continental Shelf (March 1977), vol. 1.

Kahl, R. 1991. Boating disturbance of canvasbacks during migration at Lake Polygan, Wisconsin. *Wildlife Society Bulletin* 19:242-248.

Kaiser, M. and Fritzell, E. 1984. Effects of river recreationists on green-backed heron behavior. *Journal of Wildlife Management* 48(2):561-567

Keane, K. 1998. California Least Tern Breeding Survey: 1998 Season. Report to California Department of Fish and Game, Habitat Conservation and Planning Branch.
http://www.dfg.ca.gov/habcon/info/bm_research/bm_pdfrpts/2000_01.pdf

Kelly, J.P., Etienne, K.L., Stahlberg, D., and McCaustland, M. 2005. Landscape use by herons and egrets in the San Francisco Estuary. 2005. State of the Estuary Conference [online: <http://www.irwm.org>], Oakland, California.

Kelly, J., Etienne, K., Strong, C., McCaustland, M. and Parkes, M.L. 2006. Annotated Atlas and Implications for the conservation of heron and egret colonies in the San Francisco Bay Area. Audubon Canyon Ranch Technical Report 90-3-17.

Kessel, B., Rocque, D. A. and Barclay, J. S. 2002. Greater Scaup (*Aythya marila*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/650>

Klein, M.L. 1993. Waterbird behavioral response to human disturbance. *Wildlife Society Bulletin* 21:31-39.

Klein, M.J., S.R. Humphrey, and H.F. Percival. 1995. Effects of ecotourism on distribution of waterbirds in a wildlife refuge. *Conservation Biology* 9:1454-1465.

Knapton, R., Petrie, S. and Herring, G. 2000. Human disturbance of diving ducks on Long Point Bay, Lake Erie. *Wildlife Society Bulletin* 28 (4):923-930.

Kopec, A.D. and Harvey, J.T. 1995. Toxic pollutants, health indices, and population dynamics of harbor seals in San Francisco Bay, 1989-1992. Moss Landing Marine Laboratories Technical Report 96-4. Moss Landing, CA. 168 p.

Korschgen, C.E. and Dahlgren, R.B. 1992. Human disturbance of waterfowl: causes, effects, and management. Fish and Wildlife Leaflet 13.2.15. Waterfowl Management Handbook. U.S. Fish and Wildlife Service.

Korschgen, C.E., George, L.S., and Green, W.L. 1985. Disturbance of Diving Ducks by Boaters on a Migrational Staging Area. *Wildlife Society Bulletin* 13:290-296.

Kramer, D. 1984. The effects of recreational activities on the winter wildfowl population at Priory Park Lake, Bedford, during the winter of 1982-83. *Ardea* 1983-84:34-46.

Kramer, D.L. and Bonenfant, M. 1997. Direction of predator approach and the decision to flee to a refuge. *Animal Behavior* 54:289-295.

Kushlan, J.A. and J.A. Hancock. 2005. The herons. Oxford University Press, New York.

Lafferty, K. 2001. Disturbance to wintering western snowy plovers. *Biological Conservation* 101:315-325

Lafferty, K. D. 2001. Birds at a Southern California beach: seasonality, habitat use and disturbance by human activity. *Biodiversity and Conservation* 10:1949-1962.

Lafferty, K.D., D. Goodman, and C.P. Sandoval. 2006. Restoration of breeding by snowy plovers following protection from disturbance. *Biodiversity and Conservation* 15:2217-2230.

Lelli, B. Harris, D. 2001. Human disturbances affect harbor seal haul-out behavior: can the law protect these seals from boaters? *Macalester Environmental Review* Oct 23, 2001:1-16

Lewis, K. 2001. "California's Ecological Reserves." *Outdoor California*. Vol: 62, No. 6. November-December, 2001.

Lidicker, Jr., W.Z, Ainley, D.G. 2000. "Harbor Seal." Pgs. 243-246 in Goals Project (2000) Baylands Ecosystem Species and Community Profiles: life histories and environmental requirements of key plants, fish and wildlife. San Francisco Bay Area Wetlands Ecosystem Goals Project, P.R. Olofson (ed.), San Francisco Bay Regional Water Quality Board, Oakland, CA.

Lima, S.L. and Dill, L.M. 1990. Behavioural decisions made under the risk of predation: a review and prospectus. *Canadian Journal of Zoology* 68:619-640.

Lord, A.J., R. Wass, J. Innes, and M.J. Whittingham. 2001. Effects of human approaches to nests of northern New Zealand dotterels. *Biological Conservation* 98:233-240.

MacKay, K. 2000. Suisun shrew (*Sorex ornatus sinuosus*). in: Olofson, P.R., ed. 2000. Baylands Ecosystem Species and Community Profiles: life histories and environmental requirements of key plants, fish, and wildlife. Goals Project (Baylands Ecosystem Habitat Goals), San Francisco Bay Regional Water Quality Control Board, Oakland, California.

Manna, J, Roberts, D., Press, D. and Allen, S. (2006) Harbor seal monitoring. San Francisco Bay Area. National Park Service Annual Report. Point Reyes National Seashore, Point Reyes, CA. 22 p.

Mathews, G. V. T. 1982. The control of recreational disturbance. Chap. 42, pages 325-330 in D. A. Scott, ed. *Managing wetlands and their birds, a manual of wetland and waterfowl management*. Proceedings 3rd Technical Meeting on Western Palearctic Migratory Bird Management, Biologische Station Rieselfelder Münster, Federal Republic of Germany, 12-15 October 1982.

McCrimmon, Jr., D. A., Ogden, J. C. and Bancroft, G. T. 2001. Great Egret (*Ardea alba*), *The Birds of North America Online* (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/570>

Midpeninsula Regional Open Space District (MROSD). 2003. *Resource Management Five-Year Strategic Plan*. February 25, 2003. Available online at http://www.openspace.org/plans_projects/downloads/Resource_Mgmt_Plan_2003.pdf

----- . 1982-2006. *Use and Management Plan Amendments*.

----- . 2006. “About the Midpeninsula Regional Open Space District.” Retrieved April 28, 2006 from Http://www.openspace.org/about_us/default.asp

----- . 2009. Home page: Welcome to Our Open Space! <http://www.openspace.org>. (accessed 8/18/09)

Miles, A. K. 2000. Surf Scoter (*Melanitta perspicillata*). Pp. 273-276 in Goals Project 2000.

Mori, Y. Sodhi, N.S., Kawanishi, S. and Yamagishi, S. 2001. The effect of human disturbance and flock composition on the flight distances of waterfowl species. *Journal of Ethology* 19(2):115-119.

Mount, J. 2007. *CALFED Independent Science Board Recommendations for Sea Level Rise Estimates in Delta Planning Efforts*. September.

Mowbray, T. B. 2002. Canvasback (*Aythya valisineria*), *The Birds of North America Online* (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the *Birds of North America Online*: <http://bna.birds.cornell.edu/bna/species/659>

National Marine Fisheries Service (NMFS). 2008. Responsible Marine Wildlife Viewing. <http://www.nmfs.noaa.gov/pr/education/viewing.htm> (accessed 1/22/08).

----- . 2009a. Essential Fish Habitat. <http://swr.nmfs.noaa.gov/efh.htm> (accessed 8/13/2009)

----- . 2009b. Fisheries Management Plan (FMP) Species Distributions In San Francisco, San Pablo and Suisun Bays. http://swr.nmfs.noaa.gov/hcd/HCD_webContent/EFH/sanfran_fmp.htm (accessed 8/13/2009)

National Marine Manufacturers Association. 2006. *2005 Recreational Boating Statistical Abstract*.

National Park Service (NPS). 1980. *General Management Plan: Environmental Analysis. Golden Gate National Recreation Area and Point Reyes National Seashore, California*. U.S. Department of the Interior, National Park Service, 1980

----- . 1994. *Final General Management Plan Amendment: Creating a park for the 21st century, from military post to national park. Presidio of San Francisco, Golden Gate National Recreation Area, California*. U.S. Department of the Interior, National Park Service 1994

- . 1996. *1996 Crissy Field Plan Environmental Assessment*. U.S. Department of the Interior, National Park Service 1996. Prepared by Jones and Stokes.
- . 2000. *Fort Baker Plan and Final Environmental Impact Statement. Fort Baker, Golden Gate National Recreation Area, California*. U.S. Department of the Interior, National Park Service 2000.
- . 2001. Management Policies. Chapter 8.1. Retrieved February 27, 2006 from: <http://www.nps.gov/refdesk/mp/>
- . 2006. *Management Policies 2006*. Available online at <http://parkplanning.nps.gov/document.cfm?parkId=303&projectId=12791&documentID=18432>
- . 2009. Rosie the Riveter/World War II Home Front National Historical Park General Management Plan. <http://www.nps.gov/rori/parkmgmt/planning.htm>. January.
- Nelson, N.C. 1909. Shellmounds of the San Francisco Bay region. University of California Publications American Archaeology and Ethnology 7: 309-356.
- Newby, T.C. 1973. Changes in the Washington State harbor seals population. Murrelet 54: 4-6.
- Nickel, B. 2003. Movement and habitat use patterns of harbor seals in the San Francisco Estuary, California. MA Thesis, San Francisco State University
- Nordstrom, C. 2002. Haul-out selection by Pacific harbor seals (*Phoca vitulina richardii*): isolation and perceived predation risk. Marine Mammal Science 18:194-205.
- Orr, R.T. 1965. Interspecific behavior among pinnipeds. Sonderdruck aus Z.F. Säugetierkunde Bd. 30, H.3, S.: 163-171
- Osborn, L.S. 1985. Population dynamics, behavior, and the effect of disturbance on haulout patterns of the harbor seal *Phoca vitulina richardsi* in Elkhorn Slough, Monterey Bay, California. B.A. Thesis. Dept. Environmental Studies, University of California, Santa Cruz. 75 p.
- Outdoor Industry Foundation. 2006. *Outdoor Recreation Participation Study – Eighth Edition for the Year 2005*. June, 2006.
- Overpeck, Jonathan T., Otto-Bliesner, Bette L., Miller, Gifford H., Muhs, Daniel R., Alley, Richard B., Kiehl, Jeffrey T. 2006. Paleoclimatic Evidence for Future Ice-Sheet Instability and Rapid Sea-Level Rise. *Science* 24 March 2006:Vol. 311. no. 5768, pp. 1747 – 1750. DOI: 10.1126/science.1115159
- Page, G. W., J. S. Warriner, J. C. Warriner, and P. W. Paton. 1995. Snowy Plover (*Charadrius alexandrinus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/154>

Page, G.W., Stenzel, L. and Kjelson J. 1999. Overview of shorebird abundance and distribution in wetlands of the Pacific Coast of the contiguous United States. *Condor* 101:461-471.

Page, G.W., Hickey, C.M., Stenzel, L.E.. 2000. Western Snowy Plover. Pp. 281-284 In Goals Project 2000 (q.v.)

Paulbitski, P.A. 1975. The seals of Strawberry Spit. *Pacific Discovery* 28(4): 12-15.

Peters, K.A., and Otis, D.L. 2006. Wading bird response to recreational boat traffic: Does flushing translate into avoidance. *Wildlife Society Bulletin* 34(5):1383-1391.

Petraitis, P.S. Latham, R.E. and Niessenbaum, R.A. 1989. The maintenance of species diversity by disturbance. *Quarterly Review of Biology* 64:393-418.

Pfister, C., Harrington, B.A., and Levine, M. 1992. The impact of human disturbance on shorebirds at a migration staging area. *Biological Conservation* 60:115-126.

PRBO Conservation Science [PRBO]. Undated. PRBO black rail survey protocol. 2 pp.

Public Resources Code. 1992. California State Assembly, Assembly Bill 2881, Frazee, 1992. An Act to Amend Sections 5020.1, 5020.4, 5020.5, 5024.6 and 21084 of, and to add Sections 5020.7, 5024.1, and 21084.1 to, the Public Resources Code, relating to historic resources.

Rahmstorf, S. 2007. A Semi-empirical Approach to Projecting Future Sea-level Rise. *Science* 315: 368-370.

Rapport, D.J., Regier, H.A., and Hutchinson, T.C. 1985. Ecosystem behavior under stress. *American Naturalist* 125:617-640.

Reed, J. A. and Flint, P.L. 2007. Movements and foraging effort of Steller's Eiders and Harlequin Ducks wintering near Dutch Harbor, Alaska. *Journal of Field Ornithology* 78(2):124-132.

Resource Management International, Inc. (RMI). 1999. *Final Eden Landing Ecological Reserve (Baumberg Tract) Restoration and Management Plan*. Prepared by: Resource Management International, Inc., in association with LSA Associates, Inc., Clearwater Hydrology, William Self and Associates, Andrew Leahy, Studio Green and Gary Page; Prepared for: The Wildlife Conservation Board, c/o California Department of Fish and Game, July, 1999.

Richardson, W.J., Green, C.R.J., Malme, C.I., and Thomson, D.H. 1995. *Marine Mammals and Noise*. San Diego: Academic Press.

Riffell, S.K., Gutzwiller, K.J., Anderson, S.H. 1996. Does repeated human intrusion cause cumulative declines in avian richness and abundance? *Ecological Applications* 6:492-505.

- Robinson, C., C. Strong, L. Tucci, and J. Albertson. 2006. Western snowy plover numbers, nesting success, and avian predator surveys in the San Francisco Bay, 2006. 37 pp.
- Rodgers, J.A. and Smith, H.T. 1995. Set-back distances to protect nesting water colonies from human disturbance in Florida. *Conservation Biology* 9:89-99.
- . 1997. Buffer zone distances to protect foraging and loafing waterbirds from human disturbance in Florida. *Wildlife Society Bulletin* 25:139-145.
- Rodgers, J.A. and Schwikert, S.T. 2003. Buffer zone distances to protect foraging and loafing waterbirds from disturbance by airboats in Florida. *Waterbirds* 26(4):437-443.
- Ryan, T.P. 2000a. California Gull. *In* Goals Project 2000, pp. 349-351.
- . 2000b. Forester's Tern, *In* Goals Project 2000. pp. 351-355.
- San Francisco Bay Area Water Emergency Transportation Authority (WETA). 2009. Final Transition Plan. June 18, 2009.
- San Francisco Bay Area Water Transit Authority (WTA). 2003. Implementation and Operations Plan. December 2002, adopted July 10, 2003.
- San Francisco Bay Conservation and Development Commission (BCDC). 1976. *Suisun Marsh Protection Plan*, San Francisco, CA.
- . 2001. San Francisco Bay Ecology and Related Habitats. Staff Report, BCDC, San Francisco, CA. 346 p.
- . 2005. Shoreline Spaces: Public Access Design Guidelines for the San Francisco Bay.
- . 2006a. Background Report: Water Trail Access Issues, Opportunities, and Management Strategies. March 21, 2006.
- . 2006b. San Francisco Bay Trail Steering Committee Meeting Summary. October 3, 2006.
- . 1968, 2007a. San Francisco Bay Plan, Reprinted January, 2007, San Francisco, CA.
- . 2007b. Draft San Francisco Bay Area Water Trail Plan. September 7, 2007.
- . 2008. Frequently Asked Questions. <http://www.bcdc.ca.gov/permits/faqs.shtml#2> (accessed Oct 8, 2008).
- . 2009a. Draft Staff Report and Revised Preliminary Recommendation for Proposed Bay Plan Amendment 1-08 Concerning Climate Change (For Commission consideration on

November 5, 2009). http://www.bcdc.ca.gov/proposed_bay_plan/bpa_1-08_cc_staff-rpt_11-05.pdf. (accessed 12/1/09)

-----, 2009b. Addendum to Draft Staff Report and Revised Preliminary Recommendation for Proposed Bay Plan Amendment 1-08 Concerning Climate Change (For Commission consideration on November 5, 2009). http://www.bcdc.ca.gov/proposed_bay_plan/bpa-1-08_addendum_11-05.pdf. (accessed 12/1/09)

-----, 2009c. San Francisco Bay scenarios for sea level rise [maps]. http://www.bcdc.ca.gov/planning/climate_change/index_map.shtml. (accessed 12/1/09)

-----, 2010. California Environmental Quality Act Air Quality Guidelines. June 2.

San Francisco Regional Water Quality Control Board (RWQCB). 2000. Draft Staff Report on Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines. May. <http://www.spn.usace.army.mil/conops/beneficialreuse.pdf>. Accessed 8/17/09.

-----, 2007. *The San Francisco Bay Basin Water Quality Control Plan (Basin Plan)*.

-----, 2008. Interim Final Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater. May. http://www.swrcb.ca.gov/rwqcb2/water_issues/available_documents/ESL_May_2008.pdf. Accessed 8/17/09

L., Bordage, D. and Reed, A. 1998. Surf Scoter (*Melanitta perspicillata*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/363>

Savard, Jean-Pierre L., Daniel Bordage and Austin Reed. 1998. Surf Scoter (*Melanitta perspicillata*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/363>.

Schacter, C., C. Robinson, and J. Demers. 2008. Colonial Waterbird Nesting Summary for the South San Francisco Bay, 2008.

San Francisco Bay Bird Observatory (SFBBO). 2008. Final Report to Don Edwards San Francisco Bay National Wildlife Refuge and California Department of Fish and Game. December 2008. http://www.sfbbo.org/docs/SFBBO_Waterbird_Nesting_Summary_2008.pdf

Scott, G.W., A.R. Niggebrugge, and B. Sweeney. 1996. Avian habituation to recreational disturbance on the North Yorkshire coast. *Naturalist* 121:11-15.

Shellhammer, H.S. 2000a. Salt marsh harvest mouse (*Reithrodontomys raviventris*). In: Olofson, P.R., ed. 2000. Baylands Ecosystem Species and Community Profiles: life histories and

environmental requirements of key plants, fish, and wildlife. Goals Project (Baylands Ecosystem Habitat Goals), San Francisco Bay Regional Water Quality Control Board, Oakland, California.

-----, 2000b. Salt marsh wandering shrew (*Sorex vagrans halicoetes*). in: Olofson, P.R., ed. 2000. Baylands Ecosystem Species and Community Profiles: life histories and environmental requirements of key plants, fish, and wildlife. Goals Project (Baylands Ecosystem Habitat Goals), San Francisco Bay Regional Water Quality Control Board, Oakland, California.

Shields, M. 2002. Brown Pelican (*Pelecanus occidentalis*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/609>

Shuford, W.D. and T. Gardali. Eds. 2008. California Bird Species of Special Concern: a ranked assessment of species, subspecies, and distinct populations of birds on immediate conservation concern in California. Studies in western Birds I. Western Field Ornithologists, Carmillo, California and California Department of Fish and Game, Sacramento.

Smit, C.J. and Visser, G.J.M. 1993. Effects of disturbance on shorebirds: a summary of existing knowledge from Dutch Wadden Sea and Delta area. Wader Study Group Bulletin 68 (Special Issue).

Smith, L.W. 1987. *A Review of Circulation and Mixing studies of San Francisco Bay, California*. U.S. Geological Survey Circular 1015. 38 pp.

Sonoma Land Trust, California Department of Fish and Game, and U.S. Fish and Wildlife Service (prepared by ICF Jones & Stokes). 2009. Sears Point Wetland and Watershed Restoration Project Draft Environmental Impact Report/Environmental Impact Statement (DES-08-32). August.

Sousa, W.P. 1984. The role of disturbance in natural communities. *Annual Review of Ecology, Evolution and Systematics* 15:353-391.

Spaling, H. and Smit, B. 1993. Cumulative environmental change: conceptual frameworks, evaluation approaches, and institutional perspectives. *Environmental Management* 17:587-600.

Steidl, R.J., and Anthony, R.G. 2000. Experimental effects of human activity on breeding bald eagles. *Ecological Applications* 10(1): 258-268.

Stenzel, L.E., Carter, H. R., Henderson, R. P., Emslie, S. D., Rauzon, M. J., Page, G.W., O'Brien, P. Y. 1995. Breeding Success of Double-Crested Cormorants in the San Francisco Bay Area, California *Colonial Waterbirds*, Vol. 18, Special Publication 1: The Double-Crested Cormorant: Biology, Conservation and Management (1995), pp. 216-224

Stenzel, L.E., Hickey, C.M., Kjelson, J.E. and Page, G.W. 2002. Abundance and distribution of shorebirds in the San Francisco Bay Area. *Western Birds* 33:69-98.

- Suryan, R. and Harvey J. 1999. Variability in reactions of Pacific harbor seals, *Phoca vitulina richardsi*, to disturbance. Fishery Bulletin 97:332-339
- Takekawa, J., J. Evens, and K. Lafferty. 2008. Waterbirds and Human Disturbance in an Urbanized Areas. <http://www.sfbayjv.org/pdfs/disturbancereview061908c.pdf>
- Takekawa, J.Y. and Marn, C.M. 2000. Canvasback. p. 268-272 in Goals Project 2000.
- Takekawa, J.Y., Page, G.W., Alexander, J.M. and Becker, D.R. 2000. Waterfowl and shorebirds of the San Francisco Bay Estuary. In Goals Project. 2000. Baylands Ecosystem Species and Community Profiles: Life histories and environmental requirements of key plants, fish, and wildlife. Prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. P.R. Olofson, ed. San Francisco Bay Regional Water Quality Control Board, Oakland, Calif.
- Takekawa, J.Y., Lu, C.T. and Pratt, R. 2001. Avian communities in baylands and artificial salt evaporation ponds of the San Francisco Estuary. Hydrobiologia 466:317-328.
- Takekawa, J.Y., Wilson, N.R., De La Cruz, S.W., and Anfinson, J.O. 2008. Effects of Ferry Traffic on Migratory Waterbirds in the San Francisco Bay. USGS Open File Report, Presentation to South Bay Science Symposium, 2008.
- Terhune, J.M and Almon, M. 1983. Variability of harbor seal numbers on haul-out sites. Aquatic Mammals 10: 71-78.
- Thompson, B., T. Adelsbach, C. Brown, J. Hunt, J. Kuwabara, J. Neale, H. Ohlendorf, S. Schwarzbach, R. Spies, and K. Taberski. 2007. Biological effects of anthropogenic contaminants in the San Francisco Estuary. Environmental Research 105:156-174.
- Thompson, D.B.A. and Thompson, M.L.P. 1985. Early warnings and mixed species association: the Plover's page revisited. Ibis 127: 559-562.
- Thompson, P.M., Fedak, M.A., McConnell, B.J., Nicholas, K.S. 1989. Seasonal and sex-related variation in the activity patterns of common seals (*Phoca vitulina*). Journal of Applied Ecology 26: 521-535.
- Thompson, P.M, Mackay, A., Tollit, D.J., Enderby, S. and Hammond, P.S. 1998. The influence of body size and sex on the characteristics of harbour seal foraging trips. Canadian Journal of Zoology 76: 1044-1053
- Torok, M. 1994. Movements, daily activity patterns, dive behavior, and food habits of harbor seals (*Phoca vitulina richardsi*) in San Francisco Bay, California. MS Thesis, California State University, Stanislaus. 88 p.
- Townsend, S.E. and Lenihan, C. 2007. Burrowing owls status in the Greater San Francisco Bay Area. Proceedings of the California Burrowing Owl Symposium: November 2003, pp. 60-69. Bird Populations Monograph No. 1. Institute for Bird Populations and Albion Environmental.

- Truchinski, K, Flynn, E., Press, D., Roberts, D. and Allen, S. (2008) Pacific harbor seal (*Phoca vitulina richardii*) monitoring at Point Reyes National Seashore and Golden Gate National Recreation Area: 2007 Annual Report. National Park Service Natural Resource Technical Report NPS/SFAN/NRTR-2008/118. 26 p.
- Trulio, L. and Evens, J. 2000. California Black Rail. *In* Goals Project 2000. Pp. 341-345.
- Trulio, L.A. and J. Sokale. 2008. Foraging Shorebird Response to Trail Use Around San Francisco Bay. *Journal of Wildlife Management* 72 (8):1775–1780
- Trulio, L. 2000. Western Burrowing Owl. *In* Goals Project 2000. Pp. 362-365
- Tuite, C., M. Owen, and D. Paynter. 1983. Interactions between wildfowl and recreation at Llangorse Lake and Talybont Reservoir, South Wales. *Wildfowl* 34:48-63.
- United States Coast Guard (USCG). 2006. Sector San Francisco Vessel Traffic Service: <http://www.uscg.mil/d11/vtssf/> (accessed on February 26, 2006).
- . 2008. Press Release: Coast Guard Reminds Boaters of Security Zones in Bay. March 11, 2008.
- . 2009. USCG Vessel Traffic Service San Francisco User's Manual: <http://www.uscg.mil/D11/vtssf/vtssfum.asp> (accessed December 6, 2009).
- U.S. Department of Transportation, Federal Highway Administration, Office of Environmental Policy (DOT). 1983. Visual Impact Assessment for Highway Projects (FHWA-HI-88-054).
- United States Environmental Protection Agency (EPA). 2009. *Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. RSL Table Update*. April. <http://www.epa.gov/region09/superfund/prg/>. Accessed 8/19/09.
- . 2009a. Summary of the Resource Conservation and Recovery Act: <http://www.epa.gov/lawsregs/laws/rcra.html> (accessed December 6, 2009).
- . 2009b. Oil Pollution Act Overview: <http://www.epa.gov/OEM/content/lawsregs/opaover.htm#info> (accessed December 6, 2009).
- U.S. Fish and Wildlife Service (USFWS). 1983. California brown pelican recovery plan. 179 pp.
- . 2000. Draft Protocol for California Clapper Rail survey. Office of Endangered Species, Sacramento, California.

- . 2002. Birds of conservation concern 2002. Division of Migratory Bird Management, Arlington, Virginia. 99 pp. [Online version available at <http://migratorybirds.fws.gov/reports/bcc2002.pdf>]
- . 2003. Don Edwards San Francisco Bay National Wildlife Refuge. Park brochure available online at: <http://library.fws.gov/refuges/DEsanfran.pdf>
- . 2007. Recovery Plan for the Pacific Coast Population of the Western Snowy Plover (*Charadrius alexandrinus nivosus*). Volume 1: Recovery Plan. California/Nevada Operations Office. Approved August 13, 2007. http://www.fws.gov/arcata/es/birds/WSP/documents/RecoveryPlanWebRelease_09242007/WSP_Final_RP_10-1-07.pdf
- . 2008. Formal endangered species consultation on the proposed South Bay Salt Pond Restoration Project long-term plan and the project-level Phase 1 actions, Alameda, Santa Clara, and San Mateo Counties, California. 190 pp.
- . 2010. Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California. Sacramento, California. xviii + 636 pp.
- URS Corporation (URS). 2003. *Final Program Environmental Impact Report. Expansion of Ferry Transit Service in the San Francisco Bay Area*. Prepared for the Water Transit Authority. June 2003.
- Vivian-Smith, G. and E.W. Stiles. 1994. Dispersal of salt marsh seeds on the feet and feathers of waterfowl. *Wetlands* 14: 316-319.
- Walters, R., R. Cheng, and T. Conomos. 1985. *Time Scales of Circulation and Mixing Processes of San Francisco Bay Waters*. *Hydrobiologia* 129: 12-36.
- Watson, R.T.(ed.). 2002. *Climate Change 2001 Synthesis Report*. Cambridge University Press Cambridge, UK. 397pp.
- Webb, N.V. and D.T. Blumstein. 2005. Variation in human disturbance differentially affects predation risk assessment in Western Gulls. *Condor* 107(1):178-181.
- West, A.D., Goss-Custard, J.D., Stillman, R.A., Caldow, R.W.G., Durrell, S.E.A.L.D., and McGrorty, S. 2002. Predicting impacts of disturbance on shorebird mortality using a behaviour-based model. *Biological Conservation* 106:319-328.
- World Business Council for Sustainable Development and World Resources Institute. 2004. *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard*. Revised Edition.
- Wormsworth and Mallon. 2008. *Bird species and Climate Change, The Global Status Report: A synthesis of current scientific understanding of anthropogenic climate change impacts on*

global bird species now, and projected future effects. Climate Risk Limited. www.climaterisk.net

Ydenberg, R.C. and Dill, L.M. 1986. The economics of fleeing from predators. *Advances in the Study of Behavior* 16:229-249.

Yochem, P.K., B.S. Stewart, R.L. DeLong, and D.P. DeLong. 1987. Diel haul-out patterns and site fidelity of harbor seals (*Phoca vitulina richardsi*) on San Miquel Island, California, in Autumn. *Marine Mammal Science* 3: 323-332.

PERSONAL COMMUNICATIONS

Brian Aviles, GGNRA, January 10, 2008.

Peter Bay, personal communication with Gavin Archbald 2009

Peter Bay, personal communication with Katharyn Boyer 2009

V. Bloom, USFWS, January 30, 2008.

James Browning, USFWS, May 27, 2008.

Winnie Chan, USFWS, January 22, 2008

S. Euing, July 3, 2009

Emma Grigg, January 27, 2010

Emma Grigg, personal communication with S. Allen, National Park Service, July __2010

Emma Grigg, personal communication with D. Greig, The Marine Mammal Center, July __2010

Emma Grigg, personal communication with J. Ryan, Don Edwards San Francisco Bay National Wildlife Refuge, July __2010

Roger Jaeckel, California Maritime Academy, December 1, 2009.

R. Leong, USFWS, January 17, 2008.

Bob Licht, January 7, 2008

Mia Manroe, GGNRA, January 7, 2008.

Steve Ortega, GGNRA, January 7, 2008.

John Sindzinski, WETA, January 9, 2008

Penny Wells, January 9, 2008

WEBLINKS

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6.3 GLOSSARY

Access point – A shoreline location where human-powered boats and/or beachable sail craft can be launched and/or landed. Term refers to both launch and destination sites.

Backbone Site – Existing or planned access points on the Bay, as identified in the draft Water Trail Plan, for non-motorized small boats. These sites include both launch and destination sites, are open to the public, and do not have conditions that would preclude inclusion in the Water Trail.

California Bay-Delta Authority – The California Bay-Delta Authority oversees the implementation of the CALFED Bay-Delta Program for the 25 state and federal agencies working cooperatively to improve the quality and reliability of California’s water supplies while restoring the Bay-Delta ecosystem. The Authority is comprised of state and federal agency representatives, public members, a member of the Bay-Delta Public Advisory Board, ex-officio legislative members and members at large.

Bay Plan – The San Francisco Bay Plan was completed and adopted by BCDC in 1968 and was adopted by the State of California in 1969. The Bay Plan contains policies to guide current and future uses of the Bay and shoreline, and maps that apply these policies to the present Bay and shoreline. BCDC may amend the Bay Plan from time to time as long as the changes are consistent with the McAteer-Petris Act.

Bay Trail Plan – The Bay Trail Plan was adopted by ABAG in July 1989. It is a plan to develop a trail that forms a “ring around the Bay.” It includes a proposed trail alignment; a set of policies to guide the future selection, design and implementation of routes; and strategies for implementation and financing.

Cal Boating – California Department of Boating and Waterways. Cal Boating’s mission is to provide safe and convenient public access to California’s waterways and leadership in promoting the public’s right to safe, enjoyable, and environmentally sound recreational boating.

Canoe – Small boat usually crewed by one to three people, open-hulled and propelled by single-bladed paddles. Suitable for protected waters.

Conservancy – California State Coastal Conservancy. The Conservancy is a state agency established in 1976 to work with others to preserve, protect and restore the resources of the California Coast.

Destination site or landing site – A shoreline location where human-powered boats and/or beachable sail craft can land, but from which they cannot or should not be launched. A destination site still needs to have, at a minimum, facilities for landing and then re-launching a non-motorized small boat (e.g. a ramp, float, beach, etc.). Most of these landing-only sites are neither accessible by car (e.g. Angel Island) nor within a reasonable distance for boaters to transport their boats to the launch.

Dinghy – See **Rowboat**.

Dragon Boat – Relatively large, open-hulled small boat up to 45-feet long and usually crewed by 22 paddlers. Some designs are suitable for open waters. Frequently raced.

Embayment – A small indentation of the shoreline, possibly including a small beach.

High Opportunity Sites - A subset of Backbone access points requiring minimal planning, management changes and improvements on which initial implementation of the Water Trail Plan will be focused. In addition, such sites do not require additional improvements beyond signage. No major management issues (e.g. user conflicts, wildlife disturbances, and health risks from poor water quality) are expected to be caused by trailhead designation that would require further site assessment, planning or management changes prior to designation.

Human-powered boats and beachable sail craft – Any type of paddle or rowing vessel (e.g., kayak, dragon boat, rowboat, scull, etc.), or sailboard (windsurfer or kiteboard). The terms are used interchangeably with “NMSBs” to refer to the WT user groups.

Kayak – Relatively long (12-19 feet) and thin, small boat crewed by one or two people and maneuvered by a single double-bladed oar. Includes traditional kayaks (sea or touring kayaks) and sit-on-top kayaks (restricted to calm waters and suitable for users with relatively little training).

Kiteboarder/Kitesurfer – Board strapped to feet of single user, propelled by kite attached via harness. Needs 10-25 knot winds.

Landing site – See “Destination site.”

Launch site – A shoreline location where human-powered boats and/or beachable sail draft gain access onto the Bay or a waterway connected to the Bay.

McAteer-Petris Act – Passed in 1965, this act established BCDC and mandated the development of the Bay Plan.

Non-motorized small boat (NMSB) – Any type of paddle or rowing vessel (e.g. kayak, dragon boat, rowboat, scull, etc.), or sailboard (windsurfer or kiteboard). This phrase is used interchangeably with “human-powered boats and beachable sail craft” to refer to the WT user groups.

Outrigger Canoe – Open-hulled, small boat up to 40-feet long, usually crewed by six paddlers, well-suited to Bay open waters. Frequently raced.

Paddlesport – Includes use of kayaks, canoes, dragon boats, sculls, whaleboats and rowboats or dinghies. Also includes rafting (not common on San Francisco Bay).

Participant-days – The total number of days that NMSBs are used. For example, one NMSB used 12 days would constitute 12 participant-days. Two NMSBs used 4 days each would constitute 8 participant-days.

Rowboat – Relatively wide, heavy, small boat usually rowed by one person, stable.

Rules of the Road – USCG’s Inland Navigation Rules.

Safety Exclusion Zone – Areas where navigation is prohibited to protect land-side facilities and/or protect boaters from hazards.

Sailboard – See **windsurfer** and **kiteboarder**.

Scull – Narrow and long, open-hulled small boat with two, four, or eight rowers with long rowing oars. Requires calm water. Team racing is popular.

Site designation – Inclusion of a boat launch or destination site into the Water Trail. Once a site has been designated, it is considered a trailhead and can be promoted as part of the WT. Ownership and responsibility for site management remain with the site manager and/or owner (i.e. these do not transfer to the WT organization). A trailhead can be undesignated by the WT Project Management Team. This removes it from the WT, and thus from any education or outreach media (e.g. guidebook, website, etc.). However, undesignating a site does not necessarily affect the availability of access and facilities at the site.

Take – Under Section 3(18) of the Endangered Species Act: “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct” with respect to federally listed endangered species of wildlife.

Trailhead – A boat launch or destination site that has been designated as part of the Water Trail.

Trailhead Plan – A plan prepared by the WT Site Manager that describes existing site features and proposed WT-related improvements, management and maintenance, and education, outreach and stewardship actions for the WT site and how these support the vision and goals of the Bay Area Water Trail. The Trailhead Plan identifies who will be responsible or take the lead for implementing the proposed components and should include a budget describing funding that the site manager is seeking for the trailhead development.

United States Code – the code of laws of the United States. Also known as the "U.S. Code," it contains 50 titles, each of which covers a subject area such as Agriculture, Labor, and Public, Health and Welfare. As each new law is passed, the relevant sections of the code are modified and updated.

Water Trail Plan - San Francisco Bay Area Water Trail Plan.

Water Trail – A network of launch and destination, or landing, sites that allow people in human-powered boats and beachable sail craft to take multiple-day and single-day trips on the Bay.

Whaleboat – Wide, heavy rowboat with a usual crew of 10 (eight rowers). Stable in open waters. Frequently raced.

Windsurfer – Board 6-10 feet long with removable mast and single sail, maneuvered by single user, requires strong (15-30 knot) winds.

ACRONYMS AND ABBREVIATIONS

AB 1296	Water Trail Act
ABAG	Association of Bay Area Governments
ADA	Americans with Disabilities Act
BCDC	San Francisco Bay Conservation and Development Commission
BMP	Best Management Practice
BNA	Boating Needs Assessment (2002 Cal Boating Report)
CalEPA	California Environmental Protection Agency
CalTrans	California Department of Transportation
CDBA	California Bay-Delta Authority
CCP	Comprehensive Conservation Plan

CDBA	California Dragon Boat Association
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CMA	Congestion Management Agency
CNPS	California Native Plant Society
CSU	California State University
CWA	Federal Clean Water Act
DEIR	Draft Environmental Impact Report
DFG	California Department of Fish and Game
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EBRPD	East Bay Regional Park District
ESA	Federal Endangered Species Act
GGNRA	Golden Gate National Recreation Area
HOS(s)	High Opportunity Site(s)
HSC	Harbor Safety Committee of the San Francisco Bay Region
MARAD	U.S. Department of Transportation Maritime Administration
MMPA	Marine Mammal Protection Act
MROSD	Midpeninsula Regional Open Space District
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMSB(s)	Non-motorized small boat(s)
NSMWA	Napa Sonoma Marshes Wildlife Area
NWR	National Wildlife Refuge
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOP	Notice of Preparation
NPPA	California Native Plant Protection Act
NPS	U.S. Department of the Interior, National Park Service
OSPR	Lempert-Keene-Seastrand Oil Spill Prevention and Response Act
PMT	Project Management Team
RNA	Regulated Navigation Area (established by U.S. Coast Guard)
SD	Site Description
SF	San Francisco
SPRR	Southern Pacific Railroad
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	California State Water Resources Control Board
TH	Trailhead

U.S.C.	United States Code
USCG	United States Department of Homeland Security, United States Coast Guard
USEPA	United States Environmental Protection Agency
USFWS	United States Department of the Interior, United States Fish and Wildlife Service
VTS	Vessel Traffic Service
WETA	San Francisco Bay Water Emergency Transportation Authority
WT	San Francisco Bay Area Water Trail
WTA	San Francisco Bay Water Transit Authority – replaced in 2007 by WETA

APPENDICES

APPENDIX A
WATER TRAIL ACT

Assembly Bill No. 1296

CHAPTER 331

An act to add Chapter 7 (commencing with Section 66690) to Title 7.2 of the Government Code, and to amend Sections 31161, 31162, and 31163 of the Public Resources Code, relating to resource conservation.

[Approved by Governor September 22, 2005. Filed with Secretary of State September 22, 2005.]

LEGISLATIVE COUNSEL'S DIGEST

AB 1296, Hancock. San Francisco Bay Area Water Trail.

Existing law establishes the jurisdiction of the San Francisco Bay Conservation and Development Commission over the waters of San Francisco Bay and Suisun Marsh. Existing law also establishes the State Coastal Conservancy with prescribed powers and responsibilities for implementing a program of agricultural land protection, area restoration, and resource enhancement within the coastal zone.

This bill would enact the San Francisco Bay Area Water Trail Act. The act would establish the San Francisco Bay Area Water Trail to link access to the waters of the San Francisco Bay and Suisun Marsh that are available for navigation by human-powered boats and beachable sail craft, and provide for diverse water-accessible overnight accommodations. On or before January 1, 2008, the San Francisco Bay Conservation and Development Commission would be required to prepare and submit to the Legislature the San Francisco Bay Area Water Trail Plan making recommendations, as specified, on the development of the water trail. The act would require the commission, in collaboration with the State Coastal Conservancy and the Association of Bay Area Governments, to establish and coordinate a collaborative partnership with other interested parties in the development of the plan.

The bill would designate the State Coastal Conservancy as the lead agency in the funding and development of projects to implement the San Francisco Bay Area Water Trail Plan, and would authorize the conservancy to undertake projects and award grants to advance the preparation or implementation of the plan. The bill would require the conservancy to help coordinate a collaborative partnership with the San Francisco Bay Conservation and Development Commission, the Association of Bay Area Governments, and other interested parties, to advance the preparation of the plan. Upon the completion of the plan, the bill would require the conservancy to consider the plan's adoption and inclusion of appropriate elements of the plan in the conservancy's strategic plan.

The people of the State of California do enact as follows:

SECTION 1. Chapter 7 (commencing with Section 66690) is added to Title 7.2 of the Government Code, to read:

CHAPTER 7. SAN FRANCISCO BAY AREA WATER TRAIL

66690. This chapter shall be known, and may be cited as, the San Francisco Bay Area Water Trail Act.

66691. The Legislature finds and declares the following:

(a) The public has an interest in the San Francisco Bay and the surrounding watershed lands as one of the most valuable natural resources of the state, a resource that gives special character to the San Francisco Bay Area. San Francisco Bay is the central feature in an interconnected open-space system of watersheds, natural habitats, waterways, scenic areas, agricultural lands, and regional trails.

(b) Water-oriented recreational uses of the San Francisco Bay, including kayaking, canoeing, sailboarding, sculling, rowing, car-top sailing, and the like, are of great benefit to the public welfare of the San Francisco Bay Area. With loss of public open space, the public increasingly looks to the bay, the region's largest open space, for recreational opportunities. Water-oriented recreational uses are an integral element of the recreational opportunities that span the San Francisco Bay Area and add to the community vitality and quality of life that the citizens of the region enjoy.

(c) Water trails have been designated throughout the United States and have proven to be an important vehicle for promoting water-oriented recreation for citizens of all economic means. Water trails can inform the public about natural, cultural, and historic features and foster public stewardship of these resources. Water trails aid in urban renewal of industrial waterfronts. In combination with hiking, biking, and horse trails, water trails are an important element in the development of multiuse and multiday recreational opportunities that in turn have a positive regional economic benefit.

(d) Bay Access, Incorporated, a nonprofit organization dedicated to the creation of the San Francisco Bay Area Water Trail, has identified a series of existing and potential access points to the San Francisco Bay that encircle the bay. The designation of a water trail linking these existing and any future access sites that is designed and implemented consistent with this chapter, would advance the regional goals and state mandate of the commission to foster public access and recreational use of the bay.

(e) San Francisco Bay is an aquatic habitat of international importance. It provides critical habitat for 70 percent of the shore birds and 50 percent of the diving ducks on the Pacific Flyway, as well as for many other waterbird species. It also provides habitat for marine mammals, other aquatic species, and colonial nesting birds, including many federal- and

state-listed endangered or threatened species, such as the endangered California clapper rail.

(f) The San Francisco Bay Area Water Trail, established pursuant to this chapter, shall be implemented consistent with the goals of improving access to, within, and around the bay, coast, ridgetops, and urban open spaces while respecting the rights of private property owners, considering navigation safety and homeland security concerns in establishing the access points around the bay and the siting of overnight accommodations, minimizing the adverse impacts on agricultural operations, and protecting endangered and threatened species, and species of special concern.

(g) It is not the intent of the Legislature, in enacting this chapter, to modify any provision of this title except as otherwise expressly provided in this chapter.

66692. (a) For the purposes of this chapter, the area referred to as the San Francisco Bay Area includes the nine Bay Area counties and navigable waters and tributaries under tidal influence that are part of or feed into San Francisco Bay.

(b) The San Francisco Bay Area Water Trail primary project area shall be the area within the commission's jurisdiction as defined in Section 66610 of this code, and the area described in Section 29101 of the Public Resources Code.

66693. (a) The San Francisco Bay Area Water Trail is hereby established.

(b) The San Francisco Bay Area Water Trail shall be developed in a timely manner.

(c) The San Francisco Bay Area Water Trail, to the extent feasible, shall link access to the waters of the San Francisco Bay that are available for navigation by human-powered boats and beachable sail craft, and shall provide for diverse water-accessible overnight accommodations, including camping.

(d) The San Francisco Bay Area Water Trail shall be developed in a manner consistent with the right to access navigable waters of the state contained in Section 4 of Article X of the California Constitution.

(e) The San Francisco Bay Area Water Trail shall be developed in a manner consistent with all federal laws and regulations pertaining to navigation safety and homeland security.

66694. (a) The commission shall conduct a public process to develop a San Francisco Bay Area Water Trail Plan for the San Francisco Bay Area. The plan shall make recommendations on all of the following:

(1) Policies, criteria, and guidelines for the appropriate location, design, operation, and maintenance of access to the bay.

(2) Locations where the water trail can coordinate with landside trails and other recreational facilities to accommodate opportunities for multiday, overnight travel.

(3) Organizational structure and procedures for the management and operation of the water trail and the education of end users in ways that will

advance navigational safety, protect wildlife, and foster stewardship of natural resources.

(4) Identification of sensitive wildlife areas where access should be managed or prohibited.

(5) Identification of areas where access should be limited or prohibited due to considerations related to navigation safety and homeland security.

(b) In developing the San Francisco Bay Area Water Trail, the commission, in collaboration with the State Coastal Conservancy and the Association of Bay Area Governments, shall establish and coordinate a collaborative partnership with other interested persons, organizations, and agencies, including, but not limited to, interested state, county, and district departments and commissions, parks and park districts, ports, regional governmental bodies, nonprofit groups, user groups, and businesses.

(c) On or before January 1, 2008, the commission shall submit the plan to the Legislature.

SEC. 2. Section 31161 of the Public Resources Code is amended to read:

31161. The Legislature hereby finds and declares that the nine counties that bound San Francisco Bay constitute a region with unique natural resource and outdoor recreational needs. San Francisco Bay is the central feature in an interconnected open-space system of watersheds, natural habitats, waterways, scenic areas, agricultural lands, and regional trails.

SEC. 3. Section 31162 of the Public Resources Code is amended to read:

31162. The conservancy may undertake projects and award grants in the nine-county San Francisco Bay Area that will help achieve the following goals of the San Francisco Bay Area Conservancy Program:

(a) To improve public access to, within, and around the bay, coast, ridgetops, and urban open spaces, consistent with the rights of private property owners, and without having a significant adverse impact on agricultural operations and environmentally sensitive areas and wildlife, including wetlands and other wildlife habitats through completion and operation of regional bay, coast, water, and ridge trail systems, and local trails connecting to population centers and public facilities, which are part of a regional trail system and are consistent with locally and regionally adopted master plans and general plans, and through the provision and preservation of related facilities, such as interpretive centers, picnic areas, staging areas, and campgrounds.

(b) To protect, restore, and enhance natural habitats and connecting corridors, watersheds, scenic areas, and other open-space resources of regional importance.

(c) To assist in the implementation of the policies and programs of the California Coastal Act of 1976 (Division 20 (commencing with Section 30000)), the San Francisco Bay Plan, and the adopted plans of local governments and special districts.

(d) To promote, assist, and enhance projects that provide open space and natural areas that are accessible to urban populations for recreational and educational purposes.

SEC. 4. Section 31163 of the Public Resources Code is amended to read:

31163. (a) The conservancy shall cooperate with cities, counties, and districts, the bay commission, other regional governmental bodies, nonprofit land trusts, nonprofit landowner organizations, and other interested parties in identifying and adopting long-term resource and outdoor recreational goals for the San Francisco Bay Area, which shall guide the ongoing activities of the San Francisco Bay Area Conservancy Program. The conservancy shall utilize the list of priority areas and concerns established by the bay commission pursuant to subdivision (b) of Section 31056 as guidance in the selection of those San Francisco area projects that are within the jurisdiction of the bay commission. However, the guidance provided by the bay commission is advisory and the conservancy shall have the responsibility for making program decisions. Any acquisition of real property using funds authorized pursuant to this chapter shall be from willing sellers if the land is actively farmed or ranched. Any acquisition of real property by the conservancy pursuant to this chapter shall be from willing sellers.

(b) The conservancy shall participate in and support interagency actions and public/private partnerships in the San Francisco Bay Area for the purpose of implementing subdivision (a), and providing for broad-based local involvement in, and support for, the San Francisco Bay Area Conservancy Program.

(c) The conservancy shall utilize the criteria specified in this subdivision to develop project priorities for the San Francisco Bay Area Conservancy Program that provide for development and acquisition projects, urban and rural projects, and open space and outdoor recreational projects. The conservancy shall give priority to projects that, to the greatest extent, meet the following criteria:

- (1) Are supported by adopted local or regional plans.
- (2) Are multijurisdictional or serve a regional constituency.
- (3) Can be implemented in a timely way.
- (4) Provide opportunities for benefits that could be lost if the project is not quickly implemented.
- (5) Include matching funds from other sources of funding or assistance.

(d) (1) The conservancy shall be the lead agency in the funding and development of projects implementing the San Francisco Bay Area Water Trail Plan prepared pursuant to Section 66694 of the Government Code.

(2) During the period when the plan is being prepared and after the completion of the plan, the conservancy may undertake projects and award grants that are generally consistent with and advance the preparation of the plan or achieve the implementation of the plan.

(3) To advance the preparation of the plan, the conservancy shall help coordinate a collaborative partnership with the San Francisco Bay

Conservation and Development Commission, the Association of Bay Area Governments, and other interested persons, organizations and agencies, including, but not limited to, interested state, county, and district departments and commissions, parks and park districts, ports, regional governmental bodies, nonprofit groups, user groups, and businesses.

(4) In developing the plan and undertaking projects to implement the plan, areas for which access is to be managed or prohibited shall be determined in consultation with resource protection agencies, the United States Coast Guard, the Water Transit Authority, the State Lands Commission, local law enforcement agencies, and through the environmental review process required by the California Environmental Quality Act (Division 13 (commencing with Section 21000)).

(5) Upon the completion of the plan, the conservancy shall consider the plan's adoption and inclusion of the appropriate elements of the plan in the conservancy's strategic plan.

(6) The conservancy shall not award a grant or undertake a project for the San Francisco Bay Area Water Trail that would have a significant adverse impact on a sensitive wildlife area or is in conflict with the goals of subdivision (a) of Section 31162.

APPENDIX B
INITIAL STUDY

INITIAL STUDY

San Francisco Bay Area Water Trail Plan

PREPARED FOR:

California State Coastal Conservancy

PREPARED BY:

Grassetti Environmental Consulting

November 2007

San Francisco Bay Area Water Trail Plan
Initial Study

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INITIAL STUDY
SAN FRANCISCO BAY AREA WATER TRAIL PLAN

California State Coastal Conservancy

Project Title: San Francisco Bay Area Water Trail Plan

Lead Agency Name and Address:

California State Coastal Conservancy (CEQA)
1330 Broadway, 13th Floor
Oakland, California 94612-2530

Contact Person and Phone Number:

California State Coastal Conservancy
Ann Buell, Project Manager
(510) 286-0752

Project Description

San Francisco Bay Area Water Trail Background and History

The San Francisco Bay Area Water Trail (WT) was authorized by Assembly Bill 1296, the San Francisco Bay Area Water Trail Act (Water Trail Act), which was signed into law in September 2005. In establishing the WT, the legislature found that “[w]ith loss of public open space, the public increasingly looks to the Bay, the region’s largest open space, for recreational opportunities.” It also found that “[w]ater trails can inform the public about natural, cultural, and historic features and foster public stewardship of these resources. Water trails aid in urban renewal of industrial waterfronts. In combination with hiking, biking, and horse trails, water trails are an important element in the development of multiuse and multi-day recreational opportunities that in turn have a positive regional economic benefit.”

The WT is intended to include a network of access sites (or “trailheads”) that enable people in small non-motorized boats, such as kayaks, canoes, sailboards, and dragon boats, to safely enjoy single and multiple-day trips in San Francisco Bay. This regional trail has the potential to enhance Bay Area communities’ connections to the Bay and create new linkages to existing shoreline open space and other regional trails. The WT also includes educational, stewardship, and outreach components.

The San Francisco Bay Area is defined by the legislation as the nine Bay Area counties and navigable waters and tributaries under tidal influence that are part of or feed into San Francisco Bay. The Water Trail primary project area is within the Bay Conservation and Development Commission’s (BCDC’s) jurisdiction.

The Water Trail Act outlined requirements for planning and implementing the trail. It directed BCDC, in coordination with other agencies and organizations, to conduct a public process to develop the San Francisco Bay Area Water Trail Plan (Plan), and assigned the State Coastal

Conservancy (Conservancy) as the lead for implementing the Plan. The Water Trail Act requires that the Plan make recommendations on policies, criteria, and guidelines for appropriate location, design, operation and maintenance of access; locations where the WT can coordinate with landside trails and other recreational facilities to accommodate opportunities for multi-day, overnight travel; organizational structure and procedures for the management and operation of the trail; education of trail users to advance navigational safety, protect wildlife and foster stewardship of resources; identification of sensitive wildlife areas where access should be managed or prohibited; and identification of areas with navigational safety or security issues where trail access should be limited or prohibited.

Water trail planning began in September 2005 with an assessment of perspectives, issues, organizations and individuals important to the planning process. BCDC, with help from the Conservancy and the Association of Bay Area Governments' Bay Trail Project, convened a Water Trail Steering Committee in February 2006 to provide guidance on trail organization and policies for the Water Trail Plan. The Committee was comprised of representatives from the non-motorized boating community, shoreline resource planning and management agencies and landowners, navigational safety groups, wildlife protection groups, and environmental education and stewardship interests. The core of the Steering Committee's work occurred in seven public planning meetings that were held from February 2006 through March 2007. In these meetings, the Steering Committee and members of the public discussed and provided recommendations on non-motorized small boating access; trail-related wildlife and habitat issues, safety and education; and the organizational structure for the water trail, and trail head designation. The Steering Committee and WT staff developed a Trail Vision Statement, as well as technical reports on biological resources and water quality issues, safety and education strategies, and water trail access issues. In May, 2007, the BCDC issued a draft WT Plan for public and agency review. Comments were received on that plan and incorporated into a revised draft made public in July 2007. Comments on the July revision were incorporated into a Final Draft Plan prepared in September 2007. That Final Draft Plan is available for review at: <http://www.bcdc.ca.gov> under "Water Trail Project." This Initial Study assesses at a programmatic level the potential environmental impacts of implementation of the September 2007 Plan.

WT Concept and Principles

Informally, a water trail already exists in the Bay. Boaters in human-powered craft currently enjoy point-to-point access in some portions of the Bay and they have a handful of options for multi-day excursions. However, to create the linked access envisioned for the trail and to fulfill the mandates of the legislation, trail managers need to actively and strategically "build" the trail by improving existing launch sites, developing new trail heads, coordinating and supporting ongoing management and maintenance of these sites, and implementing a comprehensive trail-wide education, outreach and stewardship program. Implementation of the WT Plan requires consideration of the suitability of different locations - either in their existing condition, or with additional improvements, or with entirely new access - for incorporation into the trail. The WT includes seven overarching principals to guide agencies and organizations involved with the WT in addressing issues associated with design, development, and management decisions. In summary, these principals are:

- To articulate a "toolbox" of trail development and management strategies;
- To conduct site assessments and planning for trailheads;

- To identify and develop management actions for sensitive wildlife and safety areas;
- To promote personal boating and navigational safety;
- To create a comprehensive water trail education program;
- To develop a water trail ethic; and,
- To develop partnerships with local, regional, state, and federal agencies, private organizations, and other institutions to advance implementation of the trail.

Project Location and Surrounding Land Uses

The project is proposed for a large number of locations around San Francisco Bay and would be based on the existing, informal network of sites. Potential WT sites are located in both urban and open space areas (See Figures 1A and 1B). San Francisco Bay is surrounded by commercial, industrial, residential, and open space lands. San Francisco International Airport as well as the Oakland, Hayward, San Carlos, and Palo Alto airports are located around San Francisco Bay, as are the ports of Oakland, San Francisco, Redwood City, and Richmond. Major open space areas around the Bay include federal wildlife refuges; local, state, federal, and regional parks, reserves, and recreation areas; salt ponds; former landfill sites; portions of former military bases (undergoing conversion to non-military uses); private undeveloped lands (including those designated for urban use); and agricultural lands.

Non-Motorized Small Boating Activities in San Francisco Bay

A variety of non-motorized small boating takes place on San Francisco Bay. Paddlesports include canoeing, kayaking, whaleboating, dragonboating, outrigger canoeing and sculling. The Bay is also a popular location for windsurfing and kitesurfing (also called kiteboarding), two sailboarding activities that emerged in the last twenty years.

Kayaks are the most likely small, non-motorized craft to embark on multi-site and multi-day trips on the Bay. They travel about two to four miles per hour depending on boater skill level, tides, currents and winds. This generally limits their range to eight to ten miles without a break. Additional intermediate landing sites could improve safety for boaters and reduce the need for emergency landings in unsuitable areas.

Existing access onto San Francisco Bay for non-motorized small boats consists of more than 135 launch and landing points in waterfront parks, marinas and harbors, sites with public launch ramps or floats, public access areas, wildlife refuges and privately owned sites. The sites vary in terms of levels of development and management that support these types of boating activities. Geographically, the launches are clustered primarily around the central Bay, from southern Marin and Contra Costa Counties south to Redwood City and San Leandro. Most of these sites are in, or near, urban areas, and this portion of the Bay is heavily used for commercial shipping, ferry transportation and all types of recreational boating. In comparison, the South Bay, San Pablo Bay and Suisun Marsh have fewer access points due to land use and management and shallow waters.

Because the Bay has relatively few beaches and since much of the Bay shoreline is armored with riprap or seawalls, access to the Bay for on-water recreation often requires some constructed elements, such as piers, docks, gangways, floats, ramps or steps. In general, floats that are low in the water provide for easy launching of all craft, and ramps through riprap that are designed

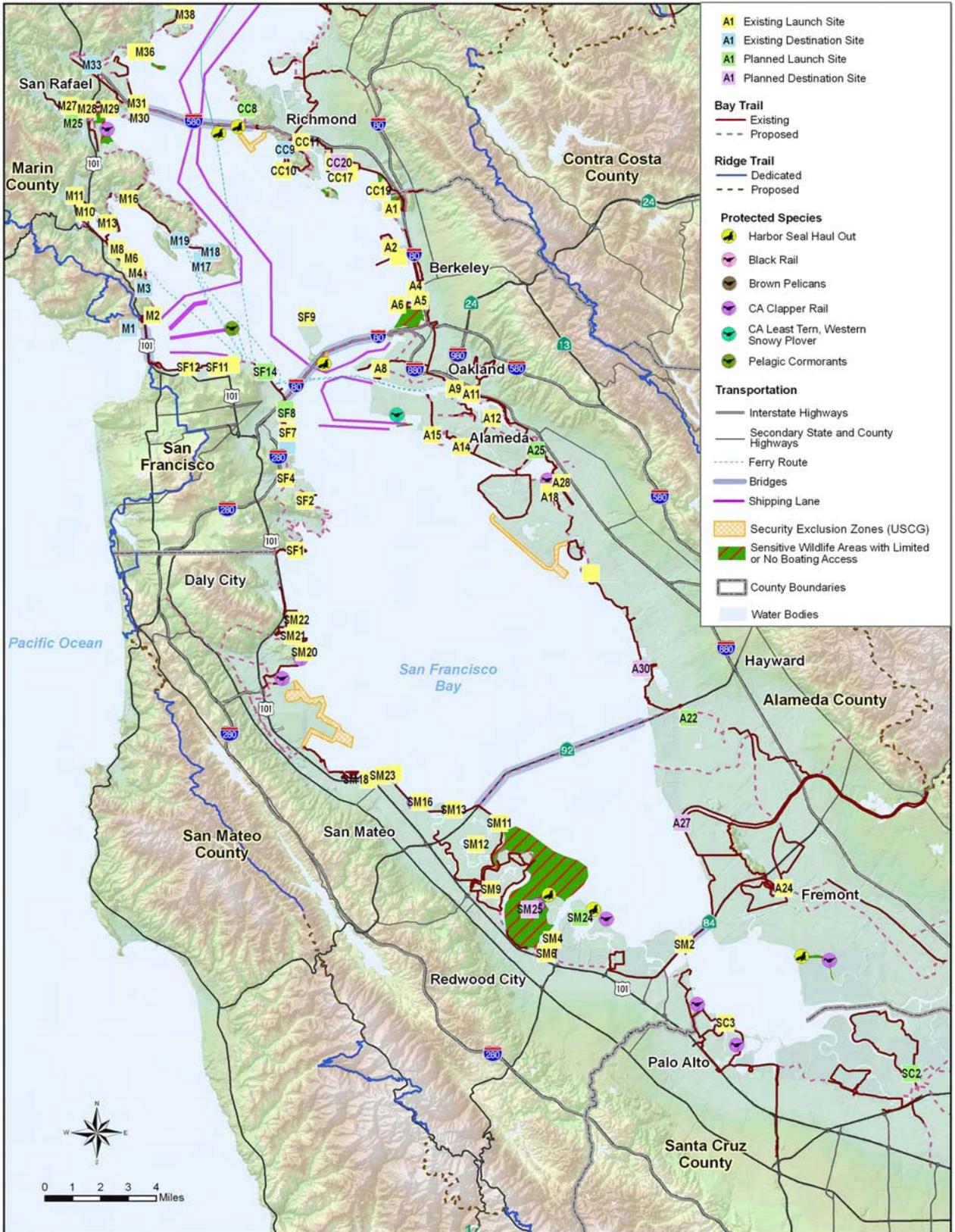


Figure 1A:
Proposed Bay Water Trail
Backbone Access Sites
San Francisco Bay

Source: BCDC Bay Water Trail Plan

Map updated 10/22/2007
 Bay Water Trail GIS data provided by BCDC
 Map produced by WWR, October 2007
 Map file: WaterTrail_SF-bay_1134_2007-1022dg.mxd



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Figure 1B:
Proposed Bay Water Trail
Backbone Access Sites
San Pablo Bay and Suisun Bay

Source: BCDC Bay Water Trail Plan

Map Updated 10/22/2007

Bay Water Trail GIS data provided by BCDC
 Map produced by WWR, October 2007
 Map file: WaterTrail_North-bay_1134_2007-1022dg.mxd

GEC Environmental Consulting



to withstand the waves and provide good traction for walking are safe for launching. Some non-motorized small boating activities have specific access requirements that must be met if a site is to be successfully used for these activities.

Provision of new access requires consideration of potential conflicts between WT users and users of existing shoreline public access (i.e. the Bay Trail). WT boater access to the edge of the water should not interrupt the flow of bicyclists and pedestrians parallel to the shoreline to ensure the safety of all people along the waterfront.

Many launch sites are located within parks owned or managed by cities, counties, regional park districts, California Department of Parks and Recreation and the National Park Service. These waterfront parks offer access via beaches, floats, stairs and ramps. Some waterfront parks have launch access and additional improvements that are well-suited for non-motorized small boating use. At other park sites, launching hand-carried watercraft is possible, but current access or facility conditions are less conducive to supporting these types of activities.

Some marinas provide publicly accessible floats or ramps that are regularly used for landing and launching non-motorized small boats. Marina sites are usually highly developed for boating activities with on-site management by a harbormaster. At public boat launch ramps, levels of facility improvements such as provision of floats (in addition to the ramp), parking and bathrooms vary considerably. Certain public access areas provide physical access to the Bay via launching ramps, floats or beaches. Most of these public access areas do not have additional improvements beyond the access itself, and lack active management or maintenance efforts. In some locations, informal use of public and private lands for landing and launching occurs where the shoreline is not too steep to preclude ingress and egress.

Currently, public access for boating on lands managed by U.S. Fish and Wildlife Service is available at Sonoma Creek (San Pablo Bay National Wildlife Refuge (NWR)). With the restoration of the South Bay Salt Ponds, additional access is likely to become available at one or more sites in the Don Edwards San Francisco Bay NWR. Although the primary purpose of wildlife refuges and ecological reserves is the conservation of wildlife and their habitat, providing opportunities for wildlife-compatible recreation activities is an important part of the land manager's mission. Similarly, many existing and proposed waterfront parks protect important wetland and upland habitats, including lands that are managed for endangered animal and plant species.

There are at least 25 windsurfing sites throughout the Bay Area where windsurfers and kitesurfers regularly launch and land their boards. Although beach launches are ideal for kitesurfing and windsurfing, there are several sites where ramps through riprap or launching floats provide serviceable access to the Bay waters. At launches shared by kayakers and windsurfers/kitesurfers, these groups might interfere with each other at the staging area or on the water. Conflicts between kayakers and motor and sail-boaters can occur at popular public launch ramps where ramp and dock space are scarce or in narrow waterways where maneuvering options are limited. Kayakers usually need some time on the launch ramp or dock to prepare their equipment.

All launch sites require some active management to maintain and operate the launch access and facilities. Without sufficient funding and staff resources devoted to upkeep, launch sites tend to degrade, becoming unusable or unsafe.

Water Trail Plan

The WT Plan is a guide to trail implementation for the agencies and organizations that will develop and manage WT access points and programs, as well as trail proponents and other stakeholders involved in trail implementation. The Plan includes policies and procedures that define how the trail will take shape over time by guiding trail planning, development, and management on organizational, programmatic, and trail-head specific levels. These are described below.

Proposed Access Sites

The vast majority of WT access sites would be designated from a starting pool of existing and planned access points. A core group of these access points on the Bay have been identified as WT Backbone Sites in the Plan (See Figures 1A and 1B). It is possible that, in the future, other, currently unidentified sites will be added to the system.

These Backbone launch sites meet the criteria of having launch facilities, planned facilities, or launch areas that are used or planned for non-motorized small boats and are open to the public. They also do not have exclusion characteristics, as described below. A subset of these Backbone Sites are High Opportunity Sites that require minimal planning, management changes and improvements (e.g. signage only) on which initial implementation should be focused. Appendix A lists the location and existing status of each of the 112 backbone sites of which 57 are High Opportunity Sites. Backbone sites are shown on Figures 1A and 1B. This is not a final trail alignment; some sites may never be improved, and new ones may be added. If new sites are considered for inclusion in the Water Trail in the future, they will be considered using the same criteria as have been used to identify the current list of Backbone sites.

Backbone Sites

Numerous access points onto San Francisco Bay are already available to non-motorized smaller boats and there are plans to develop more than a dozen more. From these sites, 112 existing and planned launch and destination sites have been chosen as the Backbone for the WT (See Figure 1 and Appendix A). This is not a final trail alignment. Some sites included in this group may never be further improved as trail heads, and, as access opportunities develop around the Bay, new sites may be added to this group. The Backbone Sites are a subset of all of the existing launch and destination points in the project area. The Backbone Sites fulfill two basic criteria:

- Have launch facilities or planned facilities (e.g., ramp, float, etc.) or launch areas (e.g., a beach) that are used or are planned for this use. The majority of existing access points around the project area fulfill this requirement. Some, however, are informal launches where property owners have not improved the site for access onto the Bay, do not manage it for this purpose or may not even be aware that it is used for launching or landing. Such sites were not included in the WT Backbone Sites.
- Are open to the public.

Some existing and planned sites are excluded from the Backbone list because they have one or more conditions that could preclude inclusion in the WT. These conditions are:

- All other facilities are absent and the site does not have the space or capacity to ever provide any of these additional amenities, and is unlikely to be an interesting or useful destination site (i.e. landing-only site).

- Property ownership or rights are unclear for the site.
- The launch or destination site owner or manager does not want the site on the WT.

High Opportunity Sites

From among the WT Backbone sites, a subset of 57 access points have been identified as High Opportunity Sites (See Appendix A). The High Opportunity Sites require only minimal assessment, planning, management changes and improvements (e.g. signage only) to become designated trail heads and will be the focus of initial implementation efforts. (This list may change as implementation of the trail proceeds.) High Opportunity Sites also have no major management issues (e.g., user conflicts, wildlife disturbances, and health risks from poor water quality) expected to be caused by trail head designation that would require further site assessment, planning or management changes prior to designation.

Plan Access Improvements And Management

Development and Management Strategies

The Plan includes a number of strategies for implementation to be developed to address trail-related access, wildlife and habitat, safety and education issues and needs. Due to the wide variety of proposed trail heads in the WT, not all strategies apply to all trail heads. These strategies are recommendations. They do not modify existing land and resource management laws and regulations. Trail managers and partners will apply the strategies within existing regulatory frameworks. Strategies are outlined in Table 1, below.

Plan Access Improvements Overview

The WT implementation could include a full range of access improvements ranging from minimal improvement (i.e. signage only, as described above) at High Opportunity Sites to development of new parking and/or launch facilities, as well as overnight facilities. Basic access to the water consists of parking and a place to launch, whether it is a beach, a dock, a float or other means. This access can be enhanced by a variety of improvements and services, such as restrooms, boat drop-off parking zones, equipment storage, public boathouses, transient docking, overnight accommodations, such as a hostel or campsite, rigging areas and fresh water for washing gear. These types of potential improvements are summarized below.

Parking

Access to adequate parking is an important component of the WT. Parking needs vary for the different on-water recreational pursuits, but generally, participants want parking near the shoreline to reduce the distance that equipment must be carried to the launch and of sufficient duration to allow for extended excursions. For windsurfing and kite sailing, the time spent rigging, sailing and de-rigging is often a minimum of three hours, so parking with a two-hour time limit is not workable. Also, since the equipment is heavy, awkward to carry and consists of many parts, frequent vehicle access is often required for rigging and de-rigging.

Kayaks, canoes and other small boats can be long, heavy and difficult to carry alone or for long distances. Parking needs for small boaters are similar to those for windsurfers, although some kayakers pursue multi-day trips that require over-night parking. Many parks and public access areas have prohibitions for overnight parking, which severely limits the locations where the user can launch a multi-day trip. At some sites parking for trailers is needed if boats are not stored on site. For example, several kayaks or windsurfers may be brought to a launch for a

Table 1: Strategies for WT Implementation

No.	Name	Strategy
1.	Trail Head Location	Seek opportunities to increase capacity at existing launches or create new access, especially at sites that are most desirable to WT users and where adverse impacts to wildlife and habitat or navigational safety are unlikely.
2.	Linking Access Points	Seek opportunities to link trail heads to one another and to other regional trails (e.g. the Bay Trail) that serve different trail users’ needs and interests.
3.	Improvements Consistent with Site Characteristics	Match the type and design of trail-related improvements to the site conditions and likely trail user groups. Ensure that the level of use accommodated provides a high-quality recreational experience, protects the environment and ensures user safety.
4.	Consistency with Policies, Plans and Priorities	Coordinate plans for trail head development, management, and use with existing policies, plans and priorities of land and resources managers at and around trail heads.
5.	Design Guidelines	Develop and update, as needed, design guidelines for trail-oriented access improvements.
6.	Management Resources	Match the facility improvements and use to the management resources available for long-term maintenance and management needs of the facilities.
7.	Maintenance and Operations	Develop a plan for maintenance and operation of trail head facilities and identify who will be responsible.
8.	Parking	Provide parking or drop-off zones as close as possible to launch points, extend parking time to at least four hours, with overnight parking where possible. Where necessary, restrict the number of users and protect shoreline visual character in locating parking.
9.	Restrooms	Provide restroom facilities where feasible and appropriate.
10.	Accessibility	Develop and improve launch facilities to be in compliance with the Americans with Disabilities Act (ADA).
11.	On-site Equipment Storage	Where feasible and appropriate, provide storage areas and facilities for human-powered boats and beachable sail craft equipment.
12.	Non-Profit Boating Clubs and On-site	Promote and encourage publicly-accessible non-profit boating clubs and/or on-site equipment concessions at appropriate trail heads and facilitate their provision of information on site-specific

	Equipment Concessions	safety and security, and wildlife and habitat issues.
13.	Overnight Accommodations	Develop new campsites at or near trail heads where consistent with land managers’ plans and resources. Coordinate with land managers, organizations and businesses to provide overnight accommodations on the trail in motels, hostels, historic ships, etc..
14.	Site Review	Conduct, coordinate or sponsor periodic reviews of trail heads to identify site-specific issues such as user conflicts, overuse of facilities or non-compliance with rules and use this information to improve site management or facilities.
15.	Habitat Restoration and Access	Seek opportunities to coordinate trail head development with habitat restoration, enhancement or creation.
16.	Monitoring Impacts	Sponsor pilot projects to monitor trail impacts in different habitats to develop and test effective and consistent monitoring methods and learn about impacts and ways to avoid them. Monitor wildlife and habitat conditions prior to, during, and after inclusion of the site as part of the trail.
17.	Outreach, Educational and Interpretative Signage	Provide signage and other media at and near trail heads, consistent with other trail outreach and education materials. Materials should be site-specific in terms of users groups, natural, cultural and historic resources, safety issues and rules.
18.	Outreach and Coordination	Coordinate with and conduct outreach to paddleboat and boardsailing teachers and guides, outfitters, and other WT-related businesses, agencies and organizations to make them aware of boating practices consistent with the WT ethic and policies.
19.	Educational Media	Provide a guide for using the WT, a trail website, brochures, maps and other educational media for WT use.
20.	Guided Trips	Provide guided trips or tours led by docents or rangers.
21.	Boater-to-Boater Education	Coordinate with agencies and boating organizations to facilitate and enhance existing boater-to-boater outreach and education, and incorporate trail-supported information and messages. Train volunteers and WT staff to educate boaters, especially during high-use times of the year.
22.	Trail Head Stewards	Recruit and coordinate volunteers to be trail head stewards to help maintain trail heads through clean-ups, and help managers do site check-ins.
23.	Training for Enforcement	Where feasible and appropriate, provide training to local law enforcement on wildlife and environmental regulations to identify or prevent violations at trail heads.

24.	Limitations on Trail Head Use	Establish limits on the number of trail users at a site to prevent impacts to wildlife, habitat, or damage to facilities. Enforce this through either parking restrictions or limits on boating activities and close access when necessary.
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class, a trip or other outing. Similarly a dragon boat or outrigger canoe may be brought to a site on a trailer.

Restrooms

Provision of restrooms (flush or portable) will be necessary for most trail heads to prevent human waste exposures for visitors, and to protect Bay habitats and water quality.

On-Site Equipment Storage

A variety of storage facilities can serve non-motorized small boaters: boat houses for all boat types including sculling shells; fenced outdoor areas for outrigger canoes; modified shipping containers for kayaks and sailboards; and provision of inside dock ties at marinas for in-water storage of dragon boats and kayaks. The feasibility of storage facilities is limited by availability of trail head space and funds for development, maintenance and equipment insurance. Furthermore, storage structures might disrupt visual access to the Bay, or detract from the character of a trail head setting.

Equipment Concessions

On-site equipment rental concessions can facilitate participation in on-water recreation, especially for beginners and visitors. Concessions can obviate the need to access the site by car, can provide classes and can rent boat storage. Concessions can also be disruptive in parks, because passive recreation space might be converted to concessionaire storage, display, equipment handling and teaching.

Overnight Accommodations

A directive of AB 1296 regarding the Bay Conservation and Development Commission's (BCDC) WT planning effort is to identify "[l]ocations where the WT can coordinate with landside trails and other recreational facilities to accommodate opportunities for multi-day, overnight travel." For on-water recreation enthusiasts in the urban Bay Area, opportunities for camping are limited. Currently state and federal parks provide the majority of the Bay-side camping opportunities. Certain waterfront parks can accommodate additional camping, provided that funding is available for managing the activity, it will not have impacts on wildlife, and will be compatible with other recreation activities.

Other opportunities for improving overnight accommodation include hostels, hotels, motels, houseboats and bed and breakfast accommodations. Some waterfront parks currently have hostels while others have plans to construct them. If indoor overnight accommodations such as hostels or small hotels are clearly incidental to and do not conflict with the primary recreational uses of a park, they can help meet the demand for multi-day overnight trips for human powered craft.

Other Site Improvements

Additional improvements and services such as guest docking, rigging areas, fresh water for washing gear, and trail head signage can facilitate non-motorized small boating activities. Launch sites with improvements that match the level of use expected at the site will accommodate visitor needs, reduce conflicts, and reduce the impacts of boating and other on-water recreation on the site. The appropriate degree of improvement is best determined by the projected use of the site for on-water recreation, the type and intensity of other uses of the site and the site managers' priorities.

Launch Design Well-designed launch facilities are essential for providing safe, durable, accessible trail access for human-powered boaters and people in beachable sail craft. To help launch site managers develop and improve their facilities to accomplish this goal, design guidelines for non-motorized boat launching facilities will be developed.

Launch design guidelines must comply with the Americans with Disabilities Act (ADA), which mandates that individuals with disabilities must be given an equal opportunity to access public facilities and that reasonable accommodations must be made to account for physical and mental limitations of individuals with disabilities.

Education, Outreach, and Stewardship

The WT Plan includes water trail education, outreach and stewardship program goals to:

- enhance the experience of paddling on the Bay to attract people to get out onto the trail.
- protect the safety of water trail users and others on the Bay.
- teach trail users how to boat in a manner that is consistent with protecting wildlife and habitat.
- foster stewardship of the trail and of Bay resources.

The education and outreach goals are proposed to be achieved through trailhead signage, outreach and coordination with educational and outreach organizations, trailhead events and programs, educational media, and boater-to-boater education.

PUBLIC AGENCIES WHOSE APPROVAL IS REQUIRED

Specific Project-Level Approvals

Implementation of the plan at specific sites may require approvals of one or more of the following agencies, depending on the specifics of the proposed actions:

- U. S. Army Corps of Engineers 404 and Section 10 permits
- Federal and State Endangered Species Acts permits
- California Department of Fish and Game Streambed Alteration Agreements
- California State Regional Water Quality Control Board 401 Certification and/or Discharge Permit
- California State Bay Area Air Quality Management District Permit
- BCDC

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a “Potentially Significant Impact” as indicated by the checklist on the following pages. A programmatic Environmental Impact Report (EIR) will be prepared to address the identified potentially significant impacts.

X		Aesthetics
		Agricultural Resources
		Air Quality
X		Biological Resources
X		Cultural Resources
		Geology/Soils
X		Hazards/Hazardous Materials
X		Hydrology/Water Quality
X		Land Use/Planning
		Mineral Resources
		Noise
		Population/Housing
X		Public Services
X		Recreation
X		Transportation/Traffic
		Utilities/Service Systems

DETERMINATION

Mandatory Findings Of Significance

On the basis of the initial evaluation:

_____ I find that the proposed project COULD NOT have a significant effect on the environment and a NEGATIVE DECLARATION will be prepared.

_____ I find that although the proposed project could have a significant effect on the environment there will not be a significant effect because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

X I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

_____ I find that the proposed project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

_____ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.


Signature

11/7/07
Date

Samuel Schuchat
Printed Name

California State Coastal Conservancy
For

EVALUATION OF ENVIRONMENTAL IMPACTS

1. AESTHETICS

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Have a substantial adverse effect on a scenic vista?	X				
b. Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?				X	
c. Substantially degrade the existing visual character or quality of the site and its surroundings?	X				
d. Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?			X		

Environmental Setting:

Urbanization and industrial uses characterize many views of the San Francisco Bay margins, although major portions of the area around the Bay remain undeveloped. Many recreational users of the waterfront -- including bird watchers, bicyclists, joggers, anglers, and pedestrians -- value the aesthetic views of the Bay’s edge. In addition, boaters on the Bay enjoy a variety of views. Major highways and other roadways offer views of the Bay, as do the bridges spanning the Bay. Open space views of tidal flats and salt marshes in many areas around the Bay afford spectacular views of wildlife and long distance views otherwise unavailable in an urban setting. Distant views from the Bay are characterized by open water, urbanized areas, and vegetated hills in the distance. Bay islands, coves, wharfs, bridges, and boats and ships, as well as large flocks of rafting birds, add variety and interest to views from the water.

Views from the water of the natural areas that front on the Bay typically include unvegetated areas (mudflats) that transition into vegetated areas (intertidal marshes and transitional vegetation) and then into developed uplands. Views also include densely developed urban areas, including residential areas, industrial facilities, piers, wharves, marinas, and seawalls. Views from upland areas are characterized by vegetated marshes of various heights, channels, and mudflats. Large flocks of shorebirds are also a characteristic visual feature of tidal mudflats. These marshes are typically bisected by open channels bounded by taller marsh vegetation.

Impact Discussion:

- a. Have a substantial adverse effect on a scenic vista? – PS

Additional small craft on the Bay as a result of the WT would provide visual interest to those viewing the Bay. Implementation of the WT Plan would, however, result in some alterations to existing Bay access points as would the addition of new access sites. Site alterations would include additional docking areas, ramps, restroom facilities, storage facilities, parking, lighting, and signage. All improvements on private or City/County lands within local jurisdictions

would be subject to local zoning controls and design review procedures, which would further limit adverse impacts.

All High Opportunity Site (HOS) improvements would be, by definition, at existing facilities and would, for the most part, be small-scale and similar in scale and design to existing facilities. Other site alterations would typically not block scenic vistas, but larger-scale site improvements such as restrooms or storage facilities could change the look of a site. This issue will be addressed in the EIR.

- b. *Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? - NI*

Although it is possible that the construction of new facilities or expansions of existing facilities could damage scenic resources around the Bay margins, there are no state-designated scenic highways within or with views of possible WT access sites.

- c. *Substantially degrade the existing visual character or quality of the site and its surroundings? - PS*

A brief description of the Backbone Site locations is provided in the table in Appendix A. The most developed of the proposed WT Backbone Sites are in marinas or harbors where further development is unlikely to have a significant impact upon the visual appearance of the sites. Many of these are High Opportunity Sites. Sites in waterfront parks range from industrialized urban (such as A18: Doolittle Drive; Airport Channel in Oakland) to open space amidst the urban development (SM2: Ravenswood Open Space Preserve). The effects of development would have to be assessed on a case-by-case basis. Those described as refuge/reserve (such as SM25: Corkscrew Slough Viewing Platform) are probably the most sensitive in terms of their proximity to wildlife and development could potentially impact the quasi-pristine character of the site.

High Opportunity Sites, by definition, are mainly those where additional development would be minimal and might consist of signage only. At other sites, additional facilities might include: extended parking, restrooms, equipment storage facilities, lighting, dock or ramp improvements, rigging areas, fresh water washing facilities, camping sites and opportunities for indoor overnight accommodation. A more detailed description of the development at each of the sites would be provided at the project level, when detailed development/improvement plans would be available for review.

As described above, development of remote sites, even with only the provision of a dock and restroom, could affect the existing visual character or quality of the site. The impacts could therefore be potentially significant. This will be evaluated further in the EIR.

- d. *Create light or glare? LS*

Most facility improvements (i.e. signage and dock improvements) would not involve new lighting, but some could and new sites could have lighting as well. Most access sites are not near homes or other light-sensitive uses, but it is possible that lighting at some sites, if not properly shielded, could disturb nearby residents. It is possible that some of the new development would require placing lighting in an area that was not already lit at night. Most new facility lighting would be in existing facilities and, if part of substantial new improvements, would be required to undergo local design review and/or additional CEQA review. Most Bay Area cities and counties require that exterior lighting be shielded so as not to extend off-site,

and California building regulations require that new exterior lighting be on timers or motion detectors to reduce energy consumption; this requirement also minimizes off-site impacts of new lighting. Lighting of sites in urbanized areas would be consistent with existing urban lighting. Lighting at new, undeveloped sites or sites that are currently unlighted would be less than significant because they would either be in an already lighted urban area or isolated from sensitive receptors (i.e. houses). In addition, lighting at all Water Trail access sites would be shielded and aimed away from sensitive viewers. Therefore no new substantial light sources would occur from the Plan. Glare is not considered to be an issue because any additional structures, such as restrooms and docks, would be small and typical construction materials used in these facilities are not conducive to glare. Non-motorized small boats are rarely used at night (except perhaps on moonlit nights) and, if they are, they provide their own small lights. Reflection of dock lighting off of the Bay waters is not considered visually intrusive or objectionable. Therefore this impact would be less than significant.

2. AGRICULTURAL RESOURCES

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X	
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X	
c. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				X	

Environmental Setting:

Although significant amounts of farmland are located in the Bay region, the waterfront areas affected by the WT are not used for agriculture. Most of the irrigated agricultural land remaining in production in the Bay Area occurs in eastern Contra Costa, Solano, and Sonoma counties, outside the immediate Bay fringe. Most of the Backbone Sites are in urban areas or parks/wildlife refuges, and not located in areas currently used as or designated for farmland.

Impact Discussion:

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? **NI**

No agricultural resources would be affected by implementation of the WT, as discussed above. WT implementation would not occur in agricultural lands, areas zoned for agriculture or protected under Williamson Act contracts. There would be no conflicts with any adopted plans or the Williamson Act.

b. *Conflict with existing zoning for agricultural use, or a Williamson Act contract? NI*

See response to item a, above.

c. *Result in conversion of Farmland to non-agricultural use? - NI*

The proposed project involves upgrading of waterfront sites to allow better water access. As described above, this activity would not occur on farmland nor convert existing farmland to any other type of use.

3. AIR QUALITY

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Conflict with or obstruct implementation of the applicable air quality plan?			X		
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			X		
c. Result in a cumulative considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?			X		
d. Expose sensitive receptors to substantial pollutant concentrations?			X		
e. Create objectionable odors affecting a substantial number of people?			X		

Environmental Setting:

The project area generally has good air quality, due to its attainment of most ambient air quality standards. However, the San Francisco Bay Area Air Basin (SFBAAB) presently exceeds state standards for ground-level ozone and particulates (Particulate Matter less than 10 microns diameter [PM₁₀]), and federal standards for ground-level ozone. These air quality conditions are the same in the north and south bay. Ozone concentrations are the highest during the warmer months. The Bay Area Air Quality Management District (BAAQMD) is responsible for regulating stationary sources of air emissions within the SFBAAB and sets guidelines to determine the significance of air quality impacts for CEQA purposes. The 1997 Clean Air Plan is used by the BAAQMD to address attainment of the state ozone standard.

Impact Discussion:

a. *Conflict with or obstruct implementation of air quality plan? - LS*

As described above, the Bay Area is presently in non-attainment status for state and federal air quality standards for particulates and ozone. Violation of air quality standards, as discussed below, would potentially conflict with the 1997 Clean Air Plan. However, project development would not be a significant contributor to air quality degradation (see below under b) and would not conflict with the Clean Air Plan.

b. *Violate air quality standard or contribute substantially to an existing or projected air quality violation? - LS*

Construction at some of the Backbone Sites and other possible access points would require use of some standard construction equipment. Given the small scale of construction activities at the sites (most of which are already in existence and only require upgrades), and required implementation of BAAQMD dust control measures for any grading (see below), the impacts on air quality due to construction are not considered significant.

After construction, the WT would not be a significant emissions source. The watercraft that would use the WT would be non-motorized and, therefore, their use would not result in emissions. However, increased access to the waterfront may result in small increases in vehicular traffic, which is a source of emissions. This increase would consist of a few cars per site per day, spread out throughout the Bay region, (see discussion under Section 15: Transportation) and therefore the impact would be less than significant.

The BAAQMD requires the following basic dust control measures that would be applicable to all WT construction activities involving earth moving:

1. Water all active construction sites at least twice daily.
2. Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.
3. Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
4. Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
5. Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.

Application of these measures would be assured through local permit conditions, and would result in a less than significant impact.

c. *Result in cumulatively considerable air pollutants? - LS*

The number of additional vehicle trips made as a consequence of this project, and their resultant emissions would be minimal (see discussion under Section 15: Transportation). Many WT users would be existing Bay boaters. In some cases WT access improvements may shorten trips for boaters, while, in other cases, boaters may put in at more distant sites. Overall this would not constitute a significant increase to emissions within the Bay Area Air Basin and this impact is considered less than significant.

d. *Expose sensitive receptors to substantial pollutant concentrations? - LS*

As discussed in item b, above, the project is not a significant source of emissions and sensitive receptors would not be significantly impacted.

e. *Create objectionable odors affecting significant number of people? - LS*

Apart from odors from construction equipment and activities such as painting during construction and maintenance, the project would not be a source of odors. Therefore this effect would be less than significant.

4. BIOLOGICAL RESOURCES

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game, or U.S. Fish and Wildlife Service?	X				
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	X				
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	X				
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	X				
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	X				

f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	X				
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Environmental Setting:

Habitat Overview

The potential WT access sites include upland, tidal and diked bayland, and open water aquatic habitats. Upland habitats may include developed lands, grassland, scrubland, riparian, fresh-water wetlands, and coast oak woodland. These habitats support a wide range of bird, reptile, and mammal species, and where water is present (such as in a pond or stream corridor), they can also support amphibians and fish. Once on the Bay, boaters would have access to open Bay water, tidal wetland, and mudflat habitats. Open water habitats support a variety of biotic communities such as rafting waterbirds and fish (including salmonids). Tidal wetland habitats are critical foraging and breeding habitat for a wide range of birds and fish, and in some instances also support small mammal and amphibian communities. Mudflats are crucial foraging grounds for shorebirds.

The biota of the Bay ecosystem includes a large proportion of non-native plant and animal species, which have been introduced to the Bay through shipping activity and other passive and active human introduction since the late 1800’s and into the present (Cohen and Carlton 1995).

Non-native organisms dominate the invertebrate community of the Bay, but most of the Bay’s wildlife and vegetation still retains abundant, sensitive native species (Cohen and Carlton 1995). The biological communities most likely to be impacted by implementation of the WT are marine mammals (primarily harbor seals, *Phoca vitulina*) and birds (primarily waterbirds). Plant communities of wetlands and uplands at the Bay edge may be locally modified by WT facilities and trail projects. These communities are discussed in depth below.

Sensitive Species

Harbor Seals and other Marine Mammals. Three marine mammal species are commonly observed in San Francisco Bay: California sea lion (*Zalophus californianus*), harbor seal (*Phoca vitulina*), and harbor porpoise (*Phocoena phocoena*). Of these species, the harbor seal is most likely to be impacted by WT activities. Harbor seals have been observed hauling out at twelve Bay locations on a consistent basis. No WT trail heads are proposed at these 12 locations. A few of these haul-outs serve as primary resting and pupping sites: Castro Rocks (near the southeastern edge of the Richmond-San Rafael Bridge), Yerba Buena Island, and Mowry Slough (Allen et al. 2006). The Bay population of seals may be vulnerable to significant disturbance impacts at these locations since they are all located at the Bay margins near existing non-powered watercraft launch sites.

Birds. The San Francisco Estuary and associated wetlands are of hemispheric importance to wintering and migrating shorebirds (Harrington and Perry 1995). This system is a critical wintering-ground, supports a large proportion of the world population of several waterfowl

species (BNA 2007), and is a stronghold for several species of special concern (Goals Project 1999).

The distribution of waterbirds within the Bay is well-documented for most species that overwinter and for all local colonial nesters (e.g. cormorants) or listed species (e.g. snowy plover, *Charadrius alexandrius nivosus*). However, changing conditions—wind, weather fronts, prey availability—may cause concentrations of waterbirds to shift among available habitats.

Divers and Dabblers. The most common diving bird species within the Bay include greater and lesser scaup (*Aythya marila* and *A. affinis*), bufflehead (*Bucephala albeola*), ruddy duck (*Oxyura jamaicensis*), surf scoter (*Melanitta perspicillata*), canvasback (*Aythya valisineria*), and western and Clark's grebes (*Aechmophorus occidentalis* and *A. clarkii*). Common dabblers include mallard (*Anas platyrhynchos*), American wigeon (*Anas americana*), and gadwall (*Anas strepera*). The vast majority of rafting waterbirds occur in San Francisco Bay during their non-breeding season, arriving here in mid-October to spend the winter and departing by the end of April. The season of peak use is November through mid-March. During the summer months, May through September, diving ducks are nearly absent from Bay waters.

Open-water diving birds occur in the Bay in the summer months, although in reduced numbers. Double-crested cormorants (*Phalacrocorax auritus*) nest in San Francisco and San Pablo Bays and are year-round residents. They gather in large flocks on the water to forage and also roost on off-shore rocks, jetties, and pilings. California brown pelicans (*Pelecanus occidentalis californicus*) also occur in summer, arriving here most commonly in April and May and remaining through fall, departing for the breeding grounds to the south by late December. Traditional roosting sites have important habitat value to both pelicans and cormorants, and are prone to disturbance. Divers tend to gather in rather large flocks (rafts), especially in leeward bays and coves. The mouths of larger tributaries also concentrate rafting waterfowl. Dabbling ducks more commonly concentrate in shallow seasonal wetlands.

Waders. San Francisco Bay holds more total waders than any other wetland in the conterminous U.S. Pacific coast in all seasons and it holds the majority of individuals of the 13 most abundant shorebirds in one or more seasons (Stenzel et al. 2002). Common waders in San Francisco Bay include willet (*Catoptrophorus semiplalmatus*), marbled godwit (*Limosa fedoa*), and various shorebirds of the genii *Calidris* and *Limnodromus*. According to Stenzel et al., “most species groups tended to concentrate in greater proportion, relative to the extent of tidal flat, either in the geographic center of the estuary or in the southern regions of the bay.” Waders, especially arctic breeding shorebirds, also winter on Bay tidal flats, shallows, and seasonal wetlands. Numbers reach their peak during the migratory period, which is protracted in the fall (August-October), but rather abrupt in the spring (April). Shorebirds forage primarily on tidal flats and roost in adjacent diked wetlands, tidal marshes, and unvegetated levees and islands.

Wetlands and Upland Shoreline Vegetation

The Bay's shoreline vegetation near existing and proposed access sites consists of (a) perennial tidal salt or brackish marsh vegetation; (b) seasonal (summer-dry) or perennial non-tidal salt, brackish, or freshwater marsh vegetation; and (c) variable terrestrial vegetation types, but mostly those dominated by non-native herbaceous broadleaf and grass weeds. Stands of predominantly terrestrial vegetation composed of native vegetation near the bay edge are relatively rare because dikes prevail along the modern shoreline. Most native terrestrial vegetation along the Bay edge is associated with hill slopes and cliffs, but these, too, are subject

to invasion by terrestrial weeds. Native terrestrial vegetation of the bayshore includes mixed evergreen forest (Marin County bayshore), coastal scrub, bunchgrass communities, riparian scrub, and oak woodland.

Stands of old, mature wetland vegetation rich in native species assemblages, whether or not they contain listed rare, threatened or endangered plants, would be considered sensitive wetland resources. Stands of marsh vegetation supporting past or present populations (seed bank or standing populations) of uncommon (regionally rare), rare, threatened or endangered plant species, whether or not their host vegetation is predominantly native or natural, would be considered sensitive wetland resources. Prevalent types of vegetation near water access points that may support regionally or globally rare/sensitive plant species include subsaline (“alkali”) seasonal wetlands or pools, fresh-brackish marsh, riparian scrub, tidal brackish or salt marsh, and nontidal brackish or salt marsh.

The predominantly native perennial marsh vegetation types of the Bay’s tidal marshes are subject to invasion by non-native wetland weeds (invasive plants) that sometimes dominate them. Mature, intact, undisturbed marsh vegetation dominated by native vegetation provides some resistance to many wetland weed invasions. Often, disturbances (physical disruption of substrate or vegetation) or changes in weed seed transport directions or rates (dispersal) are associated with, or facilitate, wetland weed invasions. Many wetland weeds have superior colonizing and dispersal ability (exceedingly high seed production, ability to establish in vegetation gaps) compared with species native to stable, mature vegetation.

Impact Discussion:

- a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game, or U.S. Fish and Wildlife Service? - PS*

Harbor Seals and other Marine Mammals. All marine mammals are protected under the Marine Mammal Protection Act (MMPA) originally passed in 1972. The MMPA prohibits the take of marine mammals in U.S. waters and the importation of marine mammals and marine mammal products into the U.S. The term “take” is defined as harassing, hunting, capturing, killing, or attempting to harass, hunt, capture, or kill any marine mammal. The term “harassment” is defined as any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal in the wild; or the potential to disturb a marine mammal in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering. In terms of the Water Trail, this would be any action by a non-motorized boat that causes a cetacean to change the direction that they are swimming or a harbor seal to flush from their haul-out location.

Open water travel by watercraft near known harbor seal haul-out sites could potentially impact populations of harbor seals by increasing their alertness/vigilance or causing them to move away from resting spots towards or into the water. Repeated disturbance could cause stress and health impacts to harbor seals unable to rest and eventually could cause seals to abandon haul-out sites altogether.

Frequencies of flushing and disturbance distances from seal haul-out sites for kayaks and canoes are comparable to or even greater than those observed for powered vessels (Suryan and

Harvey 1998). Paddle boats tend to travel closer to shore and in groups (though each group is treated as one boat in the reviewed disturbance studies), potentially increasing the likelihood of disturbances. Furthermore, the ability to approach very quietly allows kayakers to get quite close to a haul-out site before detection, possibly eliciting a “higher startle response” in the seals (Borhorquez et al. 2006). A recently completed monitoring study of three major San Francisco Bay haul-outs supports these findings; at two of the sites, kayaks caused 15% and 20% of watercraft-related disturbances and usually approached closer to the haul-outs (Allen et al. 2006). Seals are more sensitive to disturbance during molting and breeding seasons (mid-March through July) (Allen et al. 2006), and boating activities near haul-out sites during those months could affect reproductive activities. These issues are potentially significant and will be addressed in the EIR.

Birds. The location of access points to the WT could potentially impact species that are dependent on emergent tidal marsh or other habitat types adjacent to the bayshore. Potentially affected avian species include: the federally endangered California clapper rail (*Rallus longirostris obsoletus*), the state threatened California black rail (*Laterallus jamaicensis coturniculus*), the state and federally endangered California least tern (*Stern antillarum brownii*), the federally threatened Western snowy plover (*Charadrius alexandrius nivosus*), the federal and state species of concern salt marsh common yellowthroat (*Geothlepis trichis sinuosa*), and three tidal marsh song sparrows (*Melospiza melodia samuelis*, *M. m. maxillaries*, and *M. m. pusillula*) that are federal and state taxa of special concern.

Open water travel by non-motorized watercraft could have potential adverse effects on rafting waterbirds, all of which are protected under the Migratory Birds Treaty Act and several of which are special status species (CDFG 2006)—American White pelican (*Pelicanus erythrorhynchos*), California brown pelican (*Pelecanus occidentalis californicus*), double-crested cormorant (*Phalacrocorax auritus*), and California gull (*Larus californicus*).

Additionally, several locally nesting waterbird species are protected (CDFG 2006). Nesting colonies of great blue heron (*Ardea herodias*), great egret (*Ardea alba*), snowy egret (*Egretta thula*) and black-crowned night heron (*Nycticorax nycticorax*) could potentially be adversely affected by increased foot, vehicle or watercraft traffic in the vicinity of their roosting and nesting sites. Other colonial nesting gulls and terns are also protected. Finally, improving access in certain areas of the Bay margins may introduce non-motorized boaters to areas that did not experience previous boating use. This may induce impacts to bird communities in more isolated areas of tidal marshes, channels, and other bayshore habitats.

Waterbird response to human disturbance may range from tolerance (or habituation) to habitat abandonment. Disturbance events can have cumulative impacts that may reach population levels, affecting reproductive fitness and survivorship. In general, avian response to disturbance is analogous to anti-predator behavior (Frid and Dill 2000). Human intrusion into wetland habitats may have an adverse affect on waterbirds even if a given species does not leave the area (“flight response”). Subtle responses to intruders (e.g. “alert response”) may be as detrimental to a species’ fitness as the overt response of departure (Laskowski et al. 1993). When alert or flight responses increase due to human presence, maintenance behaviors (feeding, resting) decrease in frequency and reproductive fitness may be compromised.

All of these impacts will be discussed further in the EIR.

Wetlands and upland shoreline vegetation. The construction and maintenance of new launch facilities and any associated shoreline access trails (grading, herbicide treatment, capping, erosion control, construction) along the bayshore can provide both soil/vegetation disturbances that act as weed nurseries, as well as dispersal vectors (pathways for seed transport) for weeds.

Access trail extensions may create new openings for weed invasion in previously closed stands of perennial vegetation or matted leaf litter that would otherwise resist establishment of weed seedlings. When these disturbance and dispersal vectors coincide with the arrival and spread of new invasive plant species, they can significantly increase rates of spread or the feasibility of weed control. To the extent that the Water Trail projects may cause renovation, reconstruction, or upgraded maintenance of existing trails, or new trails, they may cause or contribute to additional and potentially significant spread of invasive non-native plants at some locations. The cumulative interactions of weed population spread, distribution, and the specific location trail improvement projects, may have a significant effect on weed impacts. Similarly, where water access facilities require ground-level disturbance of tidal marsh substrate and vegetation, they may create openings that are selectively favorable for weed invasions.

The construction and maintenance of new launch facilities and any associated trails could also induce impacts to existing plant communities. Many rare plant species, such as soft birds-beak (*Cordylanthus mollis* ssp. *mollis*), mason’s lilaeopsis (*Lillaeopsis masonii*), and the Suisun marsh thistle (*Cirsium hydrophilum* var. *hydrophilum*), live along the Bay margins, where new launch facilities and associated structures such as parking lots, storage structures, and restroom facilities would likely be located. Additionally, the presence of new launch facilities can often induce the creation of unauthorized “social trails” through adjacent areas. Such trails can lead to trampling and degradation of native plant communities, including special-status species, and can provide pathways for the non-native/invasive plant colonization described above.

These impacts will be discussed further in the EIR.

- b.** *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? - PS*

Tidal salt and brackish marshes and riparian and bottomlands habitats (as defined by CDFG 2003) could potentially suffer adverse effects such as trampling and vegetation degradation depending on the location and distribution of access (ingress and egress) points associated with the WT. These impacts will be discussed further in the EIR.

- c.** *Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? - PS*

Wetlands and upland shoreline vegetation. Direct water access (boat ramps, launches, water trail access points) would be likely to require placement of fill material in Section 404 tidal wetlands. Some trail connections that require crossing or filling depression nontidal wetlands in or between dikes may also require fill in Section 404 wetlands and other waters (such as seasonal pools). The cumulative and individual geographic area of such fill is likely to be less than significant, but the significance of cumulative and indirect impacts of such fills would be dependent on location (geographic context) and sensitivity of local wetland resources. These impacts will be discussed further in the EIR.

- d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? - PS*

Multiple fish species, including salmonids such as steelhead, use the Bay's open water habitats on a temporary or year-round basis. When young, salmonids will forage and find shelter in fringing tidal marsh along the Bay margins; when older, they utilize open water areas as migration corridors to upstream spawning habitats. While fish can easily sense and avoid disturbance in open water areas from non-motorized boaters, the construction of certain new launch facilities may require fill in wetlands utilized by fish as foraging/shelter habitat (see c. above). The construction of other sites may induce shading of wetlands or vegetated subtidal areas, which could lead to the death of vegetation in these areas. Wetland filling and shading may induce impacts to fish populations, and these impacts will be discussed further in the EIR.

Harbor Seals and other Marine Mammals. See (a) above. These impacts will be discussed further in the EIR.

Waterbirds. Avian movement corridors are ever-changing, dependent on tidal and weather conditions, seasonality, and species-specific phenology. There is potential for adverse effects to the movement of rafting waterfowl and roosting shorebirds, especially during the winter periods of peak use. These effects would be dependent, in part, on the level and frequency of watercraft traffic. There is additional potential for adverse effects such as flushing to birds that nest along tidal channels (e.g. California clapper rails) or upland edges (e.g. some waterfowl, shorebirds, and passerines) near where non-motorized boaters may travel. Metabolic costs to avian species are difficult to quantify, but it should be assumed that disturbance (head alert response, swimming, diving, and flying) by watercraft would have an impact. The question as to whether the anticipated level of disturbance would rise to the level of reproductive disturbance will be addressed in the EIR.

- e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? - PS*

Development of the access sites would need to comply with local land use plans and policies. This issue cannot be assessed at a program level, and would need to be discussed in project-level CEQA reviews if and when major expansions of existing facilities or new facilities are planned. General compliance issues will be addressed in the EIR.

- f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? - PS*

Critical habitat for the western snowy plover (Federal Register 70 FR 56970) includes substantial bayside property in South San Francisco Bay. Where plovers nest on Federal land, areas may be subject to closure from access to protect nesting efforts. "Because human disturbance is a primary factor affecting snowy plover reproductive success . . . Federal agencies (e.g. BLM, ACOE, NPS) would be required to consult with the Service if any action they fund, authorize, or carry out may affect the coastal population of the western snowy plover" (Federal Register 70 FR 56970). WT access points will be evaluated in the EIR to determine proximity to critical habitat(s).

The Solano County HCP (LSA 2007) identifies several tidal marsh dependent avian species that may be adversely affected by implementation of the WT. Santa Clara County has a draft HCP

(Jones and Stokes 2007) that may be finalized by the time the WT EIR has been completed. The EIR will address any conflicts that arise with these plans.

References

- Accurso, L.M. 1992. Distribution and abundance of wintering waterfowl on San Francisco Bay 1988-1990. Unpubl. Master's Thesis. Humboldt State Univ. Arcata, CA. 252 pp.
- Allen, S.A., H. Markowitz, D. Green, E. Grigg. 2006. Monitoring the potential impact of the Seismic Retrofit Construction Activities at the Richmond San Rafael Bridge on harbor seals (*Phoca vitulina*): May 1, 1998 – September 15, 2005. Richmond Bridge Harbor Seal Survey.
- Birds of North America (BNA). 2007. The Birds of North America (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.
- Borhorquez, A.S., M.J. Galloway, D.E. Green, E.K. Grigg, S.G. Allen and H. Markowitz. 2000. differential response of pacific harbor seals (*Phoca vitulina richardsi*) towards kayaks compared to other watercraft. Animal Behavior Society Conference, Georgia, August 5-10, 2000. Abstract.
- California Department of Fish and Game (CDFG) Biogeographic Data Branch. 2003. The Vegetation Classification and Mapping Program: List of California terrestrial natural communities recognized by the California Natural Diversity Database. September.
- 2006. California Natural Diversity Database List of Special Animals. February.
- Frid, A. and L. M. Dill. 2002. Human-caused disturbance stimuli as a form of predation risk. Conservation Ecology 6(1): 11. <http://www.consecol.org/vol6/iss1/art11/>.
- Goals Project. 1999. Baylands Ecosystem Habitat Goals. A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. First Reprint. U.S. Environmental Protection Agency, San Francisco, Calif./S.F. Bay Regional Water Quality Control Board, Oakland, Calif.
- Harrington, B.A. and E. Perry. 1995. Important shorebird staging sites meeting Western Hemisphere Shorebird Reserve Network criteria in the United States. U.S. Army Corps of Engineers, Seattle, WA.
- Jones and Stokes. 2007. Santa Clara Valley Habitat Conservation Plan/Natural Community Conservation Plan: Working Draft. May.
- LSA Associates, Inc. (LSA). 2007. Solano Multispecies Habitat Conservation Plan, Working Draft v.2.2. Prepared for the Solano County Water Agency. February.
- Laskowski, H., T. Leger, J. Gallgos, F. James. 1993. Behavior response of greater yellowlegs, snowy egrets, and mallards to human disturbance at Back Bay National Wildlife Refuge, Virginia. Unpublished Final Report RMS 51510-01-92. 28 November 1993.
- Stenzel, L.E., C.M. Hickey, J.E. Kjelson, and G.W. Page. 2002. Abundance and distribution of shorebirds in the San Francisco Bay Area. Western Birds 33(2):69-97.
- Suryan, R.M. and J.T. Harvey. 1998. Variability in reactions of Pacific harbor seals *Phoca vitulina richardsi*, to disturbance. Fish. Bull. 97:332-339.

5. CULTURAL RESOURCES

Would the project:	Potentially Signif. Impact	Less Than Signif. w/Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Cause a substantial adverse change in the significance of a historical resource as defined in '15064.5?	X				
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5?	X				
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?			X		
d. Disturb any human remains, including those interred outside of formal cemeteries?	X				

Environmental Setting:

The San Francisco Bay region of California is characterized by a variety of ecological settings and has a long history of human occupation ranging from 10,000 B.C. to the present. The prehistoric inhabitants of the San Francisco Bay Area hunted large and small game, collected berries and acorns, and fished the local waters. Native American groups are known to have heavily utilized marshlands for a wide variety of natural resources, and prehistoric habitation sites have been recorded in or adjacent to marshland settings. Areas used by the native populations during the prehistoric period included bayshore, estuary, and riparian settings; valley floor and associated wetlands; riverine and upland areas. After 2000 B.C., settlement and subsistence revolved more heavily around bayshore and marsh habitats (Moratto 1984). Prehistoric site types recorded in the Bay Area include village sites, temporary campsites, milling sites, petroglyphs, lithic scatters, quarry sites, shell and ash middens, and burial sites.

San Francisco Bay has a long history of maritime activities that undoubtedly left material remains along the water’s edge. The California Gold Rush of 1849 greatly stimulated San Francisco’s development as the primary port on the West Coast. Thousands of vessels took advantage of the Bay’s calm waters and the rivers that provided easy access to the Sierra foothills where gold fever was rampant. Hundreds of vessels anchored in the Bay. The importance of maritime shipping continued throughout all succeeding historic periods and areas near major watercourses, estuaries, and nearby mudflats. Early population centers could be expected to have historic remains associated with these maritime activities.

Historic sites in or adjacent to the Bay include old wharves/piers, remnants of fishing structures, sunken ships, and other old structures. Historic remains associated with maritime or fishery activities could be located where mudflat harbors and anchorages once existed, although the likelihood of discovering such remains has been reduced by infilling, diking, land reclamation, and other large-scale modifications of the bayshore landscape. Moreover, subsidence and sea-level rise have contributed to the accretion of sediments in the project area and may have buried historic resources.

Impact Discussion:

- a. *Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section '15064.5? - PS*

Development of small-scale improvements at existing sites is unlikely to affect historic resources. However, development at new sites or development at existing sites that requires substantial grading could affect above-or below-ground historic resources if they are present. In addition, increased use of the Bay margins by WT boaters could adversely affect some resources (such as historic wharves, docks, piers, and partially submerged shipwrecks) through improved access to, and increased numbers of boaters potentially accessing those resources. This issue will be addressed further in the EIR.

- b. *Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section '15064.5? - PS*

Project activities have the potential to directly affect cultural resources from ground disturbance during construction of new access features. Indirect impacts may occur as a result of increased compaction and erosion of landforms that may contain archaeological deposits. These impacts will be discussed further in the EIR.

- c. *Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? - LS*

All project construction activities, and most effects of boating activities would be on the uppermost layers of recent Bay Muds that do not have significant paleontological resources. Therefore this impact is considered less than significant.

- d. *Disturb any human remains, including those interred outside of formal cemeteries? - PS*

It is possible that excavation for new facilities could encounter human remains. Therefore this impact will be discussed further in the EIR.

6. GEOLOGY AND SOILS

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:			X		
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.			X		
ii) Strong seismic ground shaking?			X		

iii) Seismic-related ground failure, including liquefaction?			X		
iv) Landslides?				X	
b. Result in substantial soil erosion or the loss of topsoil?			X		
c. Be located on a geological unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			X		
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994) creating substantial risks to life or property?			X		
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				X	

Environmental Setting:

The San Francisco Bay and the Bay Area are located within the Coast Ranges Geomorphic Province of California, a system of northwest-southeast trending longitudinal mountain ranges and valleys that are controlled by faulting and folding. The Bay itself started to form in the Late Pleistocene (approximately 126,000 years ago) due to subsidence associated with localized oblique displacements on the San Andreas and Hayward faults. Flooding of the area occurred several times with Pleistocene sea level fluctuations.

The San Francisco Bay/Delta estuarine system drains over 40 percent of the land area in the state of California. Shoaling of navigation channels results from a combination of new sediments entering the system (primarily from the Sacramento/San Joaquin rivers) and re-suspension of existing sediment resulting from fluvial, tidal, and wind-driven waves and currents.

The San Francisco Bay Area is well known as a seismically active region. Historically, numerous moderate-to-strong earthquakes are related to the San Andreas and Hayward-Rodgers Creek fault systems. The Bay Area fault system is composed of five major faults: the San Andreas, Rodgers Creek, Hayward, Concord, and Calaveras faults. Combined, the probability of an earthquake of Richter magnitude 6.7 or greater occurring on one of these faults between 2003 and 2032 has been estimated at 62 percent (USGS 2003).

Nearshore geology along San Francisco Bay is characterized by alluvial deposits formed by the weathering and transport of older material from within and outside the Bay. In some locations, such as much of the Central Bay shoreline, development and the placement of artificial fill has displaced or buried native soils. In other locations, such as around much of the South Bay and the North Bay, the conversion of tidal wetland areas to salt ponds or agricultural fields has

allowed highly organic wetland soils to decompose, leaving more mineral soil behind and causing these areas to subside.

The slope of the terrain near the Estuary strongly influences the width of local baylands. In areas where the shoreline is steep, as in many parts of the Central Bay and along the Carquinez Strait, the baylands are restricted to narrow fringes bordering deeper water. In areas where the terrain is flatter, as in much of the South Bay, North Bay, and Suisun, the baylands are broader.

Impact Discussion:

a. *Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:*

i) Rupture of a known earthquake fault? - LS

The proposed project will focus existing usage and potentially encourage more overall usage of open water habitats by non-motorized boats in a seismically active region. Within San Francisco Bay, the Hayward-Rodgers Creek and the Green Valley-Concord fault systems are the only major fault systems presumed to cross directly under the open waters of the Bay. Of these systems, the Green-Valley-Concord fault system is closest to the largest concentration of proposed and existing launch sites in the North Bay, near the Carquinez Straits. This fault system crosses the Straits at their western confluence with Suisun Bay. The remaining North Bay sites are fairly diffuse and not concentrated near any other major active fault traces.

In the South and Central Bay, the Hayward fault runs roughly parallel to the East Bay shoreline underneath the East Bay hills, within about 8 miles of most existing and proposed launch sites within Alameda and Contra Costa County. The San Andreas fault runs roughly parallel to the Peninsula shoreline underneath the Coast Range, within about 12 miles of most existing and proposed launch sites within San Francisco, San Mateo, and Santa Clara counties.

No proposed or existing launch facilities are located immediately on or adjacent to any known active fault traces. Any new construction would be designed to meet or exceed local seismic building codes, and will only be utilized on a short-term, temporary basis by WT users. The additional potential for substantial injury or death due to fault rupture would be low.

ii) Strong seismic ground shaking? - LS, iii) Seismic-related ground failure, including liquefaction? - LS

Strong seismic shaking and seismic related ground failure can be expected along much of the bay shoreline in a major earthquake on any of the local faults. Any new launch facilities constructed as part of the Project will be located at the Bay margins, most likely on either artificial fill or native quarternary Bay Muds. Both of these geologic units are subject to liquefaction and differential settlement in the event of a major earthquake. In addition, these units tend to amplify shaking intensities compared to bedrock. Any new construction would be designed to meet or exceed local seismic building codes, and will only be utilized on a short-term, temporary basis by WT users. The additional potential for substantial injury or death due to ground failure or liquefaction would be low.

iv) Landslides?- NI

Any new launch facilities constructed as part of the Project would be located at the Bay margins, in topographically flat areas with little to no chance of being impacted by landslides. Therefore, there would be no impacts due to landslides.

b. *Result in substantial soil erosion or the loss of topsoil? - LS*

Any new launch facilities constructed as part of the Project would be on gentle slopes not subject to severe erosion and would be built using Best Management Practices (BMPs) aimed at preventing and/or minimizing erosion and topsoil loss. Increased use of access facilities and bay waterways would not affect topsoil loss. Therefore, there would be minimal impacts due to erosion/topsoil loss.

c. Be located on a geological unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? - LS

See a(iii) above. Project facilities implementation and use would not affect local soil conditions or hazards.

d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994) creating substantial risks to life or property? - LS

Any new launch facilities constructed as part of the Project would be located at the Bay margins, most likely on either artificial fill or native quaternary Bay Mud. Bay Mud is generally comprised of fine-grained mineral clay with varying amounts of organics and as such is classified as expansive soil. Artificial fill is generally more heterogeneous and may or may not be expansive. Any new construction would be designed to meet or exceed local building codes that take expansive soils into account. Coupled with the fact that these facilities would be used on a short-term, temporary basis by WT users, construction on expansive soils would not create substantial risks to life or property.

e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?- NI

New launch facility restrooms constructed as part of the Project would be connected to existing sewer systems whenever possible. In locations where sewer connections are not possible, new facilities would likely utilize portable toilets and sinks that would be pumped out and treated at a municipal wastewater system. Given the high water tables at possible access sites, new facilities would not utilize septic systems. The implementation of alternative wastewater treatment systems at new launch locations would depend on site-specific conditions, but such systems would not be connected to septic systems.

References

US Geological Survey (USGS) Working Group on California Earthquake Probabilities. 2003. Earthquake Probabilities in the San Francisco Bay Region: 2002-2031. Open File Report 03-214.

7. HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X		
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X		
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			X		
d. Be located on a site that is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5; and, as a result, would it create a significant hazard to the public or the environment?	X				
e. For a project located within an airport land use plan, or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport; would the project result in a safety hazard for people residing or working in the project area?			X		
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X	
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X	
h. Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?			X		

Environmental Setting:

Some potential access sites may be located at or near various known hazardous waste sites, including the Treasure Island Naval Station--Hunters Point Annex and the former Alameda Naval Air Station (both National Priorities List [NPL] hazardous waste sites), United Heckathorn Company in the Richmond Inner Harbor (also an NPL site), Cooley Landing Salt

Pond restoration site near East Palo Alto, and various sites in and adjacent to San Leandro Bay and the South Bay area.

At least one of the sites (A15: Encinal Launching and Fishing Facility) is known to be located within 0.25 mile of a school and several sites are within half a mile. Some project sites are located on former landfills (e.g. A1: Albany Beach) and it is conceivable, but not likely, that a potential WT site is located in an area that is on a list of hazardous waste sites.

Project sites are located within 2 miles of a major public airport of which there are seven within the project area (San Francisco International Airport, Metropolitan Oakland International Airport, Hayward Air Terminal, San Carlos Airport, Palo Alto Airport, Gness Field/Novato, and Seaplane Harbor in Alameda). For example, SM20: Colma Creek/Genentech, is within 2 miles of San Francisco International Airport. Although no private airstrips are known to lie within 2 miles of any sites, several private airstrips are located in the general vicinity.

Impact Discussion:

- a. *Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? – LS*

The project would not result in any routine transport, use, or disposal of hazardous materials. Small amounts of such materials may be used during construction activities, and would be used, stored, and handled according to label specifications and regulatory requirements. Use of the WT would not involve any transport, use, or disposal of hazardous materials. Therefore, the project would not result in a potentially significant impact.

- b. *Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? - LS*

As noted in item a, above, the project would involve only small amounts of hazardous materials and only during construction of major facility improvements requiring excavation. Those materials would be handled per applicable regulations. Therefore this impact would be less than significant.

- c. *Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? - LS*

As noted above, the project would not use, transport, store, or generate substantial quantities of hazardous materials. In addition, the project Backbone Site improvements would generally be minor and would not result in any hazards to off-site land uses. Therefore, although a number of schools may be located within 0.25 mile of one or more project sites, impacts on human health are not likely to be significant.

- d. *Be located on a site that is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5; and, as a result, would it create a significant hazard to the public or the environment? – PS*

The Department of Toxic Substances Control is mandated to keep various lists of hazardous waste sites in response to Government Code Section 65962.2, also commonly referred to as the “Cortese List”. Information supplied by DTSC, known as the Site Mitigation and Brownfields Reuse Program can be found on the DTSC website (http://www.dtsc.ca.gov/SiteCleanup/Cortese_List.cfm). Other state and local agencies are required to produce additional

information for the Cortese List. It is possible some project sites may be located near or on various known hazardous waste sites. This would be addressed on a project-level basis.

As described in the existing conditions section, some project sites may be located near various known hazardous waste sites. If any construction activities encounter site contamination, contaminated soils and/or groundwater would be handled and treated per applicable RWQCB and DTSC regulatory standards. Development of High Opportunity Sites would not generally involve construction that would disrupt or contact contaminated soils. However, sites with new construction involving excavation could disturb soils and potentially expose workers or boaters to contaminated soils or groundwater. This potential impact will be addressed in the EIR.

- e. *For a project located within an airport land use plan, or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport; would the project result in a safety hazard for people residing or working in the project area? - LS*

As described above, at least seven public airports are located within two miles of one or more project sites. However none of the potential improvements at any of the proposed WT sites would rise more than 1-2 stories and therefore would not have any potential to result in an air safety hazard.

- f. *For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area? - NI*

No private airstrips are known to lie within two miles of any project site. For private airstrips at distances greater than two miles, it is unlikely that project activities would result in a safety hazard due to the small scale of project activities. All equipment, personnel, and project activities would be located outside of any private airstrip property.

- g. *Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? - NI*

Improved Bay access would not impair implementation of or physically interfere with any emergency response or evacuation plans.

- h. *Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands? - LS*

None of the facilities would be in wildlands subject to fire hazards. All of the facilities would be in areas of high groundwater near the Bay, and most would be either in developed areas or adjacent to marshes and wetlands, which are not subject to wildfires. Outdoor grills at camping sites could pose a fire hazard, but would be subject to regulation by campsite managers. Therefore this impact is considered less than significant.

8. HYDROLOGY AND WATER QUALITY

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Violate any water quality standards or waste discharge requirement?			X		
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X	
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?				X	
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?				X	
e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	X				
f. Otherwise substantially degrade water quality?			X		
g. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X	
h. Place within a 100-year flood hazard area structures that would impede or redirect flood flows?			X		
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?			X		
j. Inundation by seiche, tsunami, or mudflow?			X		

Environmental Setting:

Hydrology

The San Francisco Estuary is the largest estuary on the West Coast of the United States. The Estuary, comprised of San Francisco Bay and the Sacramento-San Joaquin Delta, drains over 40% of California including the Sierra Nevada and Central Valley. The Sacramento and San Joaquin rivers collectively contribute roughly 95% of the total freshwater input to the Estuary; the other 5% is provided by creeks and streams that drain directly into the Bay. Approximately 25% of the water that would otherwise flow through the Delta and into the Bay is instead diverted from the Delta and sent to the Central Valley and Southern California for use as irrigation and drinking water. Water that does make it through the Delta then flows through Suisun Bay, the Carquinez Strait, and San Pablo Bay before entering San Francisco Bay and either flowing into the South Bay or exiting the Estuary through the Golden Gate. The Bay area's Mediterranean climate means that precipitation and runoff in the Estuary is highly seasonal, with more than 90% of annual runoff occurring during the October-April rainy season.

The northern reach of San Francisco Bay (comprising Suisun Bay, Carquinez Strait, and San Pablo Bay) is geographically and hydrologically distinct from the Central and South Bays. The South Bay is a tidally oscillating, lagoon-type estuary, where variations are determined by water exchange between the northern reach and the ocean. Water residence times are much longer in the South Bay than in the North Bay. The northern reach is a partially-to-well-mixed estuary (depending on the season) that is dominated by seasonally varying river inflow. The timing and magnitude of the highly seasonal river inflow modulates permanent estuarine circulation, which is largely maintained by salinity-controlled density differences between river and ocean waters.

Freshwater inflows, tidal flows, and their interactions largely determine variations in the hydrology of the Bay/Delta. Hydrology has profound effects on all species that live in the Bay/Delta because it determines the salinity in different portions of the Estuary and controls the circulation of water through the channels and bays. Circulation patterns within the Bay are influenced by Delta inflows, gravitational currents, and tide- and wind-induced horizontal circulation. The cumulative effects of the latter three factors on net circulation within embayments tend to dominate that of freshwater inflows except during short periods after large storm events (Smith 1987). Exchanges between embayments are influenced both by mixing patterns within embayments and by the magnitude of freshwater inflows (Smith 1987).

Sea Level Rise

A variety of estimates quantify the range of potential sea level rise, report observed trends and offer predictions of global warming and the potential impacts (Watson 2001, CCCC 2006, IPCC 2007). The most recent (2007) report from the Intergovernmental Panel on Climate Change (IPCC) projects a midrange sea level rise this century of 8-17 inches (0.7-1.4 ft), with a full range of variability of 7-23 inches (0.6-1.9 ft). Note that the IPCC estimate conservatively assumes no "speculative" critical threshold changes in Greenland ice sheet wasting, a process that would substantially accelerate and amplify secular rise in sea level (Overpeck et al. 2006). Empirical estimates of sea level rise produced by other researchers project a mid-range rise this century of 28-39 inches (2.3-3.3 ft) with a full range of variability of 20-55 inches (1.7-4.6 ft), substantially

higher than IPCC 2007 projections (Rahmstorf 2007). Other recent estimates by the California Climate Change Center¹ report sea level rise in California over the past century to be approximately 7 inches (0.6 ft), and projects increases of 22 to 35 inches (1.8 to 2.9 ft) by 2100 (CCCC 2006). The projected increase in sea-level will alter historical storm frequency predictions by decreasing recurrence intervals and increasing vulnerability of coastal regions to flooding (CCCC 2006). To provide context with a generalized scenario, an increase in sea-level of one foot means that storm-surge induced flood events that formerly occurred as 100-year events would more likely occur at 10-year intervals (CCCC 2006). Local sea level rise depends upon a number of physical factors including local land vertical movement (uplift/subsidence) and hydrodynamic responses.

Water Quality

The primary water quality parameters include salinity, dissolved oxygen (DO), pH, total suspended solids (TSS), turbidity, and pollutants. Because the project has no, or minimal, potential to affect salinity, pH, or DO, those items are not discussed further. Suspended solids/turbidity and pollutants are addressed below.

Total Suspended Solids and Turbidity

Turbidity and total suspended solids (TSS) are generally used as measures of the quantity of suspended particles. Shallow areas and channels adjacent to shallow areas have the highest suspended sediment concentrations. TSS levels vary throughout the Bay depending upon season, tidal stage, and depth. Central Bay generally has the lowest TSS concentrations; however, wind-driven wave action and tidal currents, as well as dredged material disposal and sand mining operations cause elevations in suspended solids concentrations throughout the water column.

Pollutants

Pollutant loading to San Francisco Bay has long been recognized as one of many factors that have historically stressed aquatic resources. Pollutants enter the aquatic system through atmospheric deposition, runoff from agricultural and urbanized land, and direct discharge of waste to sewers and from industrial activity. Common pollutants in the Bay include nutrients (especially nitrogen and phosphate), metals (such as copper and lead), and organic/inorganic chemicals from industrial and municipal sources.

The Bay's sediment can be both a source of and a sink for pollutants in the overlying water column. The overall influx of pollutants from the surrounding land and waste discharges can cause increases in sediment pollutant levels. Natural resuspension processes, biological processes, other mechanical disturbances, dredging, and sediment disposal can remobilize particulate-bound pollutants.

¹ The California Climate Change Center report is a multi-institution collaboration among the California Air Resources Board, California Department of Water Resources, California Energy Commission, CalEPA, and the Union of Concerned Scientists.

Sediment Quality

Sediment quality in the Bay varies greatly according to the physical characteristics of the sediment, proximity to historical waste discharges, the physical/chemical condition of the sediment, and sediment dynamics that change with location and season. Generally, the level of sediment contamination at a given location will vary depending on the rate of sediment deposition, which varies with seasons and tides. Chemical contaminant dynamics in an estuary are closely associated with the behavior of suspended and deposited sediments. Overall, the physical and chemical characteristics of sediments, and the bioavailability and toxicity of sediment-associated chemicals to aquatic organisms, are particularly important in determining their potential impact on environmental quality.

Basin Plan

The San Francisco Bay Regional Water Quality Control Board (SFRWQCB) regulates water quality in the Bay and its tributaries through implementation of a Basin Plan. The most recent version of the Basin Plan (SFRWQCB 2007) contains:

- A statement of beneficial water uses that the Water Board will protect,
- The water quality objectives needed to protect the designated beneficial water uses, and
- The strategies and time schedules for achieving these water quality objectives.

Beneficial uses specific to the Bay's shoreline waters include the following uses, which are discussed in detail in the Basin Plan:

- Estuarine Habitat
- Industrial Service Supply
- Marine Habitat
- Fish Migration
- Navigation
- Industrial Process Supply
- Preservation of Rare and Endangered Species
- Water Contact Recreation
- Noncontact Water Recreation
- Shellfish Harvesting
- Wildlife Habitat

Generally speaking, more stringent water quality objectives are applied to uses associated with human consumption, contact recreation, and biological/ecological resources than are applied to recreational and non-contact activities. While the SFRWQCB performs a number of educational, advisory, and planning roles related to improving water quality throughout the Estuary, its primary mechanisms to protect ground and surface waters are through adopting, monitoring compliance with, and enforcing waste discharge requirements and National Pollutant Discharge Elimination System (NPDES) permits. Such permits may be required for new facilities constructed as part of the Water Trail.

Impact Discussion:

a. Violate any water quality standards or waste discharge requirement? - LS

The only potential discharges proposed as part of the project are wastewater associated with the operation of new launch facilities. Those facilities would either be connected directly to, and treated at, municipal wastewater systems or, in the case of portable toilets, pumped and trucked for treatment in municipal facilities. The small quantities of additional wastewater generated by additional uses of the trail (typically in the hundreds of gallons/day) would not have the potential to adversely affect the capacity of any treatment plants, which typically process millions of gallons/day of wastewater. Any discharges from these facilities would be treated in a way that meets or exceeds discharge standards set by the SFBRWQCB Basin Plan. Washdown water for small boats that are cleaned following their use could result in small quantities of potable-water treatment chemicals washing into the bay. These chemicals typically dissipate in a few hours to days, and the anticipated small quantities would not adversely affect the receiving waters. Because the boats using the WT would not be motorized, the project would not wash oil, grease, or other lubricants into the Bay waters. WT users could introduce small quantities of pollutants into receiving waters if they allow trash and wastes from onboard items to enter the Bay. This would be minimized through signage and educational materials proposed as part of the WT Plan. Therefore the project would not violate water quality standards or waste discharge requirements.

b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)? - NI

No groundwater pumping is proposed as part of the project. Therefore the project would have no impact on groundwater supplies or recharge.

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site? - NI

WT users may induce very minor erosion of tidal channels by paddling up and down these channels and inducing the formation of small wakes. These wakes, and any attendant erosion of tidal channels, is miniscule in the context of natural tidal and wave action within the channels. Therefore, no substantial alteration of any drainage patterns or river/stream courses is expected as part of this project, so no impacts related to erosion or siltation of channels on- or off-site would occur.

d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site? - NI

See response to c, above. No substantial alteration of any drainage patterns or river/stream courses is proposed as part of this project, so no impacts related to increased surface runoff or flooding will occur.

- e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? – PS*

The primary potential sources of additional runoff resulting from project implementation are new impervious surfaces from the construction of new or expanded/improved launch facilities and associated parking areas. None of these new/expanded/improved facilities would be large enough to generate substantial amounts of runoff, but, larger new/improved facilities could generate potentially significant stormwater pollution. This impact will be addressed in the EIR.

Most of these facilities would drain directly into the Bay, and not into any streams or storm drainage facilities, so there would be minimal impacts to stormwater system capacities.

- f. Otherwise substantially degrade water quality? – LS*

Although the project is expected to increase use of the Bay by non-motorized boaters, who could be a source of small-scale water pollution if they were to discard wastes into the Bay waters, the project would educate Water Trail users about proper waste disposal practices, and launch sites would include facilities for convenient waste disposal (including restrooms) and recycling, as appropriate to the site. Therefore the project would not be expected to significantly otherwise degrade water quality.

- g. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? – NI*

No housing is proposed as part of the proposed project. Some campgrounds and/or hostels may be developed as part of the project. These short-term accommodations for recreational users would not affect housing supply or demand. Therefore, no impacts would result.

- h. Place within a 100-year flood hazard area structures that would impede or redirect flood flows? – LS*

Any new launch ramps constructed as part of the project would, out of necessity, be within a 100-year flood zone since they would be on the immediate bayshore and would need to include levee breaks to permit Bay access. Restrooms and parking lots also may be within the 100-year flood zone, depending on specific access site elevations. However, most of these facilities would not be in the path of flood flows; they would instead be subject to tidal flooding hazards. However, all new permanent habitable facilities proposed as part of the WT access improvement would be required by local permitting agencies to be designed and constructed such that the interior floors would be above the 100-year flood elevations. This would limit this impact to a less-than-significant level.

- i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam? – LS*

See response to Item h, above. Any new launch facilities constructed as part of the Project would be located at the Bay margins, which are periodically and temporarily flooded from storms, extreme tide events, large boat wakes, and other phenomena. In addition, some existing and proposed launch facilities, especially in the South Bay, are or would be located on or adjacent to existing flood control levees that could potentially (and unexpectedly) fail. Sea level rise can increase the risk of flooding along San Francisco Bay by increasing water surface

elevations in the Bay relative to shoreline elevations and by increasing storm frequencies (see “Sea Level Rise,” above). Subsidence along the shoreline can amplify these elevation differences, further increasing the risk of flooding. The inherent risk to recreational shoreline/open water users of loss, injury, or death due to flooding from naturally- or levee-induced causes will persist regardless of WT implementation.

The risk to open water users is mitigated by the fact that these users will primarily be in boats and therefore at less risk of loss, injury, or death due to drowning.

WT implementation would not significantly increase from existing levels the risk of loss, injury, or death due to flooding, and the potential for additional impacts is low. Therefore this impact would be less than significant.

j. Inundation by seiche, tsunami, or mudflow? - LS

The proposed project would focus existing usage and potentially encourage more overall usage of open water habitats by non-motorized boats in a seismically active region. While tsunamis have been infrequently recorded in San Francisco Bay, only two of 51 credible tsunamis within the Bay since 1850 were large enough to damage boats and floating structures. The most damaging of these two tsunamis, generated by a 1964 quake epicentered in Alaska, measured 7.5 ft at the Presidio (Magoon 1966). Garcia and Houston (1975) estimated peak tsunami heights at the Presidio for 100-year (8.2 ft) and 500-yr (15.7 ft) return periods, though more recent modeling by Borrero et al. (2006) estimates a peak maximum credible tsunami height of 7.9 ft at the marine oil terminal in Richmond. Tsunami wave heights entering the Golden Gate are expected to decrease by 50% once the waves reach the East Bay and 90% once the waves reach the extreme ends of the North and South Bay (Magoon 1966). The infrequency of tsunami events, coupled with their small size relative to typical storm-induced waves in San Francisco Bay, mean that the additional potential for substantial injury or death due to inundation by tsunami or seiche would be low. There is no potential for substantial injury or death due to mudflow because all existing or planned facilities are in topographically flat areas that are not at risk for mudflows.

References

- Borrero, J., Dengler, L., Uslu, B., and Synolakis, C. 2006. Numerical Modeling of Tsunami Effects at Marine Oil Terminals in San Francisco Bay. Prepared for the Marine Facilities Division of the California State Lands Commission. June 8. 38 pp.
- California Climate Change Center (CCCC). 2006. Our Changing Climate: Assessing the Risks to California. California Energy Commission, Sacramento, CA. 16pp.
- Garcia, A.W., and Houston, J.R. 1975. Type 16 Flood Insurance Study: Tsunami Predictions for Monterey and San Francisco Bays and Puget Sound. Technical Report H-75-17, U.S. Army Engineering Station, Vicksburg MD. 267 pp.
- Magoon, O.T. 1966. Structural damage by tsunamis. Proceedings, American Society Civil Engineers, Specialty Conference on Coastal Engineering, Santa Barbara, California, Oct. 1965. p. 35-68.

Overpeck, J.T., B.L. Otto-Bliesner, G.H. Miller, D.R. Muhs, R.B. Alley, J.T. Kiehl. 2006. Paleoclimatic Evidence for Future Ice-Sheet Instability and Rapid Sea-Level Rise Science Vol. 311 (5768): 1747 – 1750.

Watson, R.T. and the Core Writing Team. 2001. Climate Change 2001: Synthesis Report. International Panel on Climate Change, Geneva, Switzerland. 184 pp.

9. LAND USE AND PLANNING

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Physically divide an established community?				X	
b. Conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	X				
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	X				

Environmental Setting:

The project area includes San Francisco Bay and, in particular, the water and land areas at the edge of the Bay. The land uses surrounding areas where the Backbone Sites are proposed vary and include existing marinas, open space (including parklands, salt ponds and wildlife refuges), ports, residential areas, commercial areas (including hotels and restaurants), and industrial areas. Sites in the North Bay are typically in marinas and parks. Sites located along the East Bay range from parks and marinas to commercial areas (such as Jack London Square), ports, and salt ponds. A large portion of the southern Bay margins also falls within the San Francisco Bay National Wildlife Refuge. On the western shore of the Bay, sites are located adjacent to park, marina, commercial, and industrialized areas. Some of the areas around San Francisco Bay provide sensitive habitats that may be subject to Habitat Conservation Plans.

The project area includes WT access sites that are in heavily industrialized parts of Alameda County, such as around the Port of Oakland and Oakland airport, as well as sites in remote parts of Sonoma, Napa and Solano Counties.

In formal designation of the WT, there are several plans, policies, laws and regulations that must be taken into account and several responsible government agencies. Issues include:

- **Public Trust Doctrine and Navigable Waters.** The Public Trust Doctrine asserts that the air, seas, waterways and their shores are common assets that are held in trust by government for public benefit. The U.S. Constitution, California Constitution and Supreme Court have bearing on interpretation of this doctrine.

- **Navigational Safety and Security.** The U.S. Coast Guard regulates navigation in San Francisco Bay by issuing and enforcing rules that govern navigation practices, marine events, and safety and security zones within the Bay.
- **Wildlife and Environmental Quality Regulations.** These are explained in greater detail in Section 4: Biological Resources, but include: Federal Endangered Species Act (ESA), and California Endangered Species Act (CESA), Migratory Bird Treaty Act (MBTA) and Marine Mammal Protection Act (MMPA).
- **Bay Margin Development.** The McAteer-Petris Act of 1969 and Suisun Marsh Preservation Act of 1976 established the authority of the San Francisco Bay Conservation and Development Commission (BCDC) to control both Bay filling and dredging, Bay-related shoreline development and Marsh development. Development of WT sites that involve trail access to rivers, streams, or in wetland areas will probably require permits from the U.S. Army Corps of Engineers.
- **Management Plans and Guidelines.** Land and Resource managers implement a variety of plans and guidelines that address specific Bay locations, habitat type and species. Examples of these would be endangered and threatened species critical habitat designations and recovery plans. Comprehensive Conservation Plans (CCPs) for the National Wildlife Refuges (NWR) in the Bay are another policy source.
- **Land and Resource Managers.**
 - U.S. Fish and Wildlife Service (FWS) administers the Endangered Species Act, Migratory Bird Treaty Act and Marine Mammal Protection Act on the 30,000 acres of Bay waters and shoreline that the FWS owns and manages as National Wildlife Refuges.
 - National Park Service (NPS) is a significant federal land manager in the Bay. California Department of Parks and Recreation (State Parks) manages five Bay shoreline parks: Benicia State Recreation Area, China Camp, Angel Island, East Shore and Candlestick State Parks.
 - California Department of Fish and Game (CDFG) owns and/or manages seven wildlife areas, eight ecological reserves, five state marine parks and one state marine conservation area around the Bay.
 - California Coastal Conservancy is a state agency that works in partnership with local governments, other public agencies, non-profit organizations, and private landowners to preserve, protect, and restore the resources of the California coast and San Francisco Bay. It is responsible for implementing the WT.
 - Counties and cities around the Bay also own and manage shoreline areas and wetlands as waterfront parks and open space. Management objectives for their parks are described in their respective master plans.
 - Several types of special districts own and/or manage Bay shoreline and waters. These include East Bay Regional Park District and Midpeninsula Open Space District.
 - Flood control districts are responsible for maintaining infrastructure to control flood and storm waters.
 - Resource Conservation Districts, although generally not landowners themselves, work with private and municipal landowners to facilitate prevention of soil erosion and runoff and improve water quality and natural habitat.

- Marinas (public and private) have authority and obligations to implement rules and policies to prevent wildlife, habitat and water quality impacts on their properties.
- Private entities such as ports, businesses, homeowners and non-profits organizations also own and manage some of the Bay shoreline and have their own management objectives.

a. *Would the project physically divide an established community? - NI*

The High Opportunity Sites and most of the other Backbone Sites already are being used for water access and the WT Plan would not result in a change of use. The remaining Backbone Sites include some that are planned launches or destinations that are considered suitable for the purpose because of their location adjacent to the Bay or other waterside access point. The proposed project would result in the development of only small structures and other improvements, mostly at existing Bay access areas. The proposed action generally would attract small numbers of people to each site on a daily basis. WT access improvements at Bayfront sites would therefore not have the potential to divide any established communities.

b. *Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? - PS*

The WT Plan's Backbone sites would be comprised primarily of existing Bay access points and project improvements would be consistent with existing uses at those sites. Therefore project improvements at those sites are unlikely to conflict with applicable land use plans, policies, or regulations. However, it is possible that some larger-scale improvements may conflict with local plans and policies. In addition, possible new sites could conflict with local land use regulations. Compliance with applicable land use regulatory agencies' plans and policies, including design review, would be evaluated at the time that specific improvements are proposed.

All of the High Opportunity Sites are already used as water access points and their incorporation into a formal trail would not substantially affect their relationship to the surrounding land use. The planned launch sites and destinations are currently considered suitable for development and incorporation in the WT.

Consistency of the Water Trail Plan with relevant local and regional plans will be discussed generally in the EIR.

c. *Would the project conflict with any applicable habitat conservation plan or natural community conservation plan? - PS*

As described in the Biology section of this document, several sites in the North Bay are included in the Solano County HCP. The compliance of the Backbone Sites identified in the WT Plan with this HCP will be evaluated in the Biology section of the EIR.

10. MINERAL RESOURCES

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state?				X	
b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X	

Environmental Setting:

A number of mineral resources are present in the San Francisco Bay Area. Salt and sand are currently produced in shoreline areas. The Cargill Salt Company produces salt from evaporation ponds located along the southeastern margin of the Bay in Alameda County. Hanson Aggregates and RMC Pacific Materials currently dredge sand from the Bay in the vicinity of Alcatraz Island. Salt ponds total some 36,000 acres in South Bay and some 10,000 acres in North Bay.

Impact Discussion:

- a. *Result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state? - NI*

Project facilities would be located primarily at existing access sites, most of which are in urbanized or park areas. In addition, improvement would be small scale, and involve minimal footprints or grading. Use of the trail would not affect resource extraction areas. Therefore implementation of the Plan would not affect any known mineral resource areas.

- b. *Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan? - NI*

See response to a, above. WT access sites would not be located in designated mineral resource areas.

11. NOISE

Would the project result in :	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies?			X		
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?			X		
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			X		
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			X		
e. For a project located within an airport land use plan, or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?			X		
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?			X		

Environmental Setting:

The noise environment surrounding WT access sites varies greatly due to the widespread variations in land uses around the Bay. Areas surrounded by marsh, Bay waters, and/or parkland are typically quiet. However, sites near airports, industrial areas, highways, ports, or busy boating/shipping channels can experience high noise levels. The noise environment is primarily influenced by off-site noise generators. Ambient noise levels vary from above 65 dBA in marshes adjacent to industrial developed areas, such as the ports of Oakland and Redwood City and the San Francisco and Oakland Airports, to below 45 dBA in areas of the San Francisco Bay Refuge Complex and marshes that are surrounded by salt evaporator ponds.

Impact Discussion:

- a. *Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies? - LS*

Construction activities at WT Backbone Sites would generally be limited to minor improvements. However, at some sites, larger-scale construction, including excavation, may be required. Construction activities would generally be short-term, and would comply with applicable local agency noise ordinances and general plan noise elements.

The proposed WT uses would result in few noise-producing activities at the sites themselves or on adjacent waterways, as boats would be non-motorized. Project noise at access points would be primarily from small numbers of additional vehicular trips and conversation, neither of which would raise ambient noise levels substantially above ambient noise conditions. It is anticipated that nighttime put-ins would be limited. WT access sites would be dispersed throughout the Bay margins and high noise levels at any one site would be unlikely. Most sites are already used as parks, marinas, commercial areas and many have existing Bay access facilities. WT access would add slightly to noise generation at these sites. Therefore, it is unlikely that the project use would result in significant noise levels that would conflict with local standards.

Noise generated from WT use could adversely affect wildlife, particularly rafting birds and seals at haul-out sites. This will be addressed in the Biological Resources section of the EIR.

- b. *Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels? LS*

Construction activities that involve excavation and/or soil compaction could result in brief periods of vibration and ground-borne noise. For small facility improvements such as restrooms and dock construction, this impact would be less than significant. For larger-scale projects that involve excavation or compaction, this issue would be addressed in site-specific environmental evaluation facility improvements.

- c. *A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? LS*

See response to item a, above.

- d. *A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? LS*

See responses to items a and b, above. Note that the effects of temporary noise generated from WT use could have impacts on wildlife, particularly rafting birds, and seals. This will be addressed in the Biological Resources section of the EIR.

- e. *For a project located within an airport land use plan, or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? -LS*

WT use would take place adjacent to San Francisco International and Oakland airports. As described in items a and b, above, the WT uses are not expected to create high noise levels nor would the WT introduce new sensitive receptors to existing airport noise. All construction activities within an Airport Land Use Plan area would be consistent with applicable airport land use plans.

- f. *For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels? -LS*

See response to item e, above. The project would not expose people to significant noise levels associated with private air strips.

12. POPULATION AND HOUSING

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?			X		
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X	
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X	

Environmental Setting:

According to Association of Bay Area Governments (ABAG) data, the nine-county San Francisco Bay Area had an estimated population of 6.9 million persons in 2000. The Bay Area population is projected to increase to 7.6 million by 2010 and to 8.0 million by 2020. ABAG estimates the number of Bay Area households at 2.4 million in 2000. The number of households is projected to increase to 2.7 million by 2010 and to 2.8 million by 2020. (ABAG 1999).

Impact Discussion:

- a. *Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? - LS*

The proposed WT Plan would not result in the construction of any new homes or roads. Some small-scale business development may result to serve WT users. It is unlikely that presence of the WT would result in people choosing to move to a specific area. No development would occur that would induce population growth and associated housing.

- b. *Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? - NI*

No demolition of housing would occur as a result of WT Backbone access site improvements. Therefore, displacement of housing would not occur. Indirect impacts on residential areas elsewhere would not be expected to occur. No impacts would result.

- c. *Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere? - NI*

The proposed project is comprised of existing and, possibly, new Bay access sites. It would not involve any large-scale development. Therefore, displacement of people would not occur as a result of the proposed project.

13. PUBLIC SERVICES

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:					
Fire protection?	X				
Police protection?	X				
Schools?				X	
Parks?	X				
Other public facilities?	X				

Environmental Setting:

A wide variety of Federal, State, county, and municipal agencies of the Bay region provide shoreline fire protection, police protection, and emergency medical services to recreational boaters while accessing the Bay. The U.S. Coast Guard (Coast Guard) regulates navigation in San Francisco Bay. The Coast Guard issues and enforces regulations that govern navigation practices, marine events, and safety and security zones within the Bay.

The central Bay, from southern Marin and Contra Costa Counties south to Redwood City and San Leandro is heavily used for commercial shipping, ferry transportation and all types of recreational boating. Some of the potential WT sites are located in industrial areas or near airports, where there are safety issues related to increase in recreational use in these settings.

The U.S. Coast Guard regulates navigation in San Francisco Bay by issuing and enforcing regulations that govern navigation practices, marine events, and safety and security zones within the Bay. The Inland Navigation Rules (commonly called the “Rules of the Road”) apply to all watercraft and address vessel sailing and steering as well as use of lights and sound. Knowing the Rules is important for all mariners - including people navigating non motorized small boats which are often the smallest vessels on the Bay, and most difficult for other mariners to see and avoid.

Within the Bay, larger, deep-draft vessels can only navigate safely within dredged shipping lanes (noted on nautical charts), and the Rules oblige other vessels (including non-motorized small boats) not to “impede the passage” of these deep-draft vessels traveling in the lanes. The Rules are less explicit for interactions between other vessel types that are common on the Bay

(e.g., sailboats or small motorboats and kayaks). The Rules require a boater to try to avoid a collision. Some maritime user groups such as fast ferries are developing standard practices (e.g., consistent travel routes) to minimize accidents in general. The San Francisco Bay Harbor Safety Committee coordinates these and other efforts to improve navigational safety.

Impact Discussion:

- a. *Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: PS*

Fire Protection

Improvements at proposed access sites and increased use of existing sites may result in small numbers of additional calls for local fire department services (including emergency medical services). Since the access points are dispersed throughout the Bay, demands on fire department personnel would be spread among a number of fire departments and would not excessively burden any one department or station. This would allow fire departments to maintain acceptable service ratios while addressing the needs of the proposed project.

From a navigational standpoint the Bay's waters and its currents present extreme conditions to the non-motorized small boat user. Cold waters, rapidly changing weather conditions, strong tidal currents, and tidal fluctuations create a challenging boating environment on the Bay and around its margins. Most water trail use would most likely occur around the Bay margins (rather than in the middle of the Bay). Even a skilled boater who is familiar with Bay conditions can get into trouble and require emergency services from either the Coast Guard or from land-based emergency response providers. Once on the water, a non-motorized small boat following the WT might enter or cross defined shipping channels and ferry routes, presenting a potential navigation safety impact. Additionally, there are safety and security exclusion zones within the Bay established by the U.S. Coast Guard such as around the San Francisco and Oakland International Airports or the structural elements of the Bay's bridges. However, these zones may not be clearly understood by the recreational boater. Without explicit, broadly accepted navigational protocols or norms for vessel interactions, the expected increases in fast ferry traffic, large sailing vessels and WT users on the Bay may lead to more accidents requiring emergency services. These issues will be discussed further in the EIR.

Navigational hazards (e.g., low tide conditions) specific to the Bay's margins and to non-motorized small boats also could require more emergency services, and will be evaluated in the EIR.

Police Protection

Improvements at proposed access sites and increased day use of existing sites may result in small numbers of additional calls for local police department services (including emergency medical services). Since the access points are dispersed throughout the Bay, demands presented by most day-use WT users on police would be spread among a number of police departments and would not excessively burden any one department or beat. This would allow police departments to maintain acceptable service ratios while addressing the needs of the proposed project.

An increase in police response may be required for police patrols and calls related to overnight use at new WT campsites, particularly for agencies that do not currently allow overnight use within their park systems. In resource areas around the Bay where hunting is permitted, new opportunities for overnight accommodations might draw increased use from other recreation interests (e.g., from duck hunters). Overnight use would likely increase the need for policing and security patrols.

These issues will be discussed further in the EIR.

Schools

Few schools are located along the shoreline, with some located near the access sites. The proposed project could benefit school outdoor education programs. However the proposed project would not lead to population increases and associated student generation.

Parks

The project would likely increase use of the numerous local, regional, state, and federal parks and recreation areas around the Bay. The WT Plan includes strategies and policies for funding and management of WT access sites and facilities.

Many of the WT Backbone Sites are located in parks and other areas that are managed to enhance the recreational experience for a variety of users. With an increase in users of small non-motorized water craft, there is potential for conflicts between those site users who need water access and those who are enjoying the recreational experience on dry land and along the Bay Trail. In addition, there could be conflicts between non-motorized water craft users (such as kayakers and windsurfers) and larger boats such as yachts, and motorized boats for access at mixed-use sites such as marinas. This could impact levels of needed management on the part of the managing agency.

Introducing new access facilities onto the Bay, or incorporating an existing launch site into the WT would increase use and could lead to conflicts among users. As examples, kayakers do not generally like to launch their boats or paddle near motorized personal watercraft; launching non-motorized small boats may involve staging that, when near the Bay Trail, may conflict with use patterns along the Bay Trail. For day use at most of the WT Backbone Sites that exist, impacts to management of access points and staging area facilities are expected to be less than significant assuming the strategies outlined in the WT are followed. However, in some locations new or expanded access facilities and staging areas may present significant user-conflict impacts.

These issues will be discussed further in the Recreation section of the EIR.

Other Public Facilities

The popularity of the WT may vary from area and to area and among seasons of the year. The project therefore could increase use pressures on already popular local marinas and associated boating facilities. These issues will be discussed further in the EIR.

14. RECREATION

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	X				
b. Include recreation facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	X				

Environmental Setting:

San Francisco Bay, as the largest open space resource in the region, attracts recreational boating of all types. The popularity of non-motorized small boating in the San Francisco Bay Area is increasing.

Existing access onto the Bay for human-powered boats and beachable sail craft consists of more than 130 launch and landing sites in waterfront parks, marinas and harbors, sites with public launch ramps or floats, public access areas, wildlife refuges and privately owned sites. The sites vary in terms of level of development and management that supports these types of boating activities. Geographically, the launches are clustered primarily around the Central Bay, from southern Marin and Contra Costa Counties south to Redwood City and San Leandro. Comparatively, the South Bay, San Pablo Bay and Suisun Marsh have fewer access points.

Impact Discussion:

- a. *Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. PS*

The proposed project is designed to increase recreational use of the Bay and adjoining waterways and several of the WT Backbone Sites are located in established shoreline parks. As there would be impact to these and other recreational facilities, the issue will be discussed further in the EIR and mitigations will be developed to avoid or minimize impacts.

- b. *Include recreation facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment. PS*

Development of some of the WT Backbone Sites will require new or enhanced facilities, including features to make the sites ADA-compliant. Potential impacts to new or expanded WT access and staging area facilities would include, but not be limited to:

- (1) Access facilities to get through the shoreline edge to launch non-motorized small boats onto the Bay’s waters such as ramps, tidal steps, sand or pea gravel beaches, piers, floating docks, gangways, or floats.
- (2) Related support facilities set back from the actual shoreline edge such as vehicular access and parking, loading and rigging areas, access trails to the launch point, potable water supply, sanitary facilities (restrooms or portable toilets), showers/fresh water washing facilities, emergency phones, and safety information and regulatory signs.

- (3) Based on use and demand, onsite boat storage for non-motorized small boats might be constructed at selected staging areas.

In addition, facilities to support multiple-day trips would be needed. These would include either overnight camping sites with facilities such as platforms (land or water), cleared level areas for tents, fire rings or barbeques, and sanitary facilities (restrooms or portable toilets); or opportunities for indoor overnight accommodation such as hostels or hotels.

Depending on the location and development associated with access points, staging areas, or campgrounds, there may be potential impacts on the types and levels of service required of the managing agency and of neighboring land owners for fire/emergency response and police services. Please see Section 13, Public Services, for additional detail.

As the program impact could be significant, it will be addressed further in the EIR.

15. TRANSPORTATION/TRAFFIC

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections?			X		
b. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?			X		
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?				X	
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersection) or incompatible uses (e.g., farm equipment)?			X		
e. Result in inadequate emergency access?			X		
f. Result in inadequate parking capacity?	X				
g. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				X	

Environmental Setting:

Regional access from the north and south is provided by U.S. Highway 101, which generally parallels the west side of San Francisco Bay. U.S. Interstate 280 (I-280) also provides north-south

access to the Bay Area, but is located farther inland. Regional access from the north and south on the east side of the Bay is provided by I-880 from San Jose to Oakland, and then by I-580 and I-80 in the northern portions of the Bay. Several major roadways provide east-west access to the Bay. In the South Bay, these include State Highways 237 and 84 (Dumbarton Bridge). In the Central Bay, east-west access is provided by State Highway 92 (San Mateo Bridge) and the San Francisco-Oakland Bay Bridge. State Highways 4 and 37 are the primary east-west regional access roadways in the North Bay and Suisun Bay.

Access to the WT Backbone access sites would be via regional and local roadways. Access to some sites may require the use of private access roads. Access to privately owned sites would require permission from the property managers and/or owners.

Impact Discussion:

- a. *Would the project cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, of congestion at intersections)? - LS*

The proposed project would not be likely to result in a substantial increase in traffic nor have the potential to result in a substantial increase in the number of vehicle trips, or the volume to capacity ratio on roads or congestion at intersections. During facility construction a small number of trucks and other construction equipment may temporarily access certain sites. It is anticipated that all construction equipment would be able to park at the facility sites and not block access roadways. Larger construction projects would require detailed review of construction traffic when permit applications are filed.

Although some of the most popular of these sites, such as SF12: Crissy Field in San Francisco or A6: Emeryville City Marina, may receive several hundred visitors on certain days, others will probably only receive ten to twenty visitors at most. For most sites, it is anticipated that fewer than 50 trips/day would be generated. These additional trip levels would not measurably affect congestion or levels of service.

- b. *Would the project exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways? - LS*

As described above, the proposed project would generate negligible traffic and as such would not exceed a level of service standard, either individually or cumulatively.

- c. *Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks? - NI*

The project involves small-scale improvements at boating facilities. Therefore it would have no effect on air traffic.

- d. *Would the project substantially increase hazards due to a design feature (i.e., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? - LS*

The project anticipates small-scale improvements, mostly at existing boating facilities. No new access roads are anticipated at any of the Backbone Sites. Because the human-powered craft proposed for use on the WT are typically small and non-motorized, they would typically be carried on rooftops or in cars and pick-up trucks. Some larger craft (e.g. dragon boats and multi-person sculls) may be trailered to the sites. These vehicle types, at the low use levels

discussed in item a, above, would not substantially increase hazards associated with roadways or incompatible uses.

e. *Would the project result in inadequate emergency access? - LS*

See responses to items a and d, above, and responses to items 13 a and b (Police and Fire Services). Traffic generated by the project would be minor and not affect emergency access. Improved Bay access may improve emergency access to bayfront areas.

f. *Would the project result in inadequate parking capacity? - PS*

The project could increase parking demand at the WT access sites. It is possible that parking supplies could be exceeded at certain sites. This issue will be addressed in the EIR.

g. *Would the project conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)? - NI*

The project would facilitate alternative transportation by providing a network of water access points for non-motorized small craft. Therefore it would not conflict with local or regional adopted policies, plans, or programs supporting alternative transportation.

16. UTILITIES AND SERVICE SYSTEMS

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?			X		
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X	
c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			X		
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?			X		
e. Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?			X		

Would the project:	Potentially Signif. Impact	Less Than Signif. w/Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			X		
g) Comply with federal, state, and local statutes and regulations related to solid waste?				X	

Environmental Setting:

The Bay Area is served by a large number of water, sewage treatment, and solid waste disposal providers. Water and sewer service for much of the East Bay are provided by the East Bay Municipal Utilities District. Water and sewage treatment for San Francisco is provided by the San Francisco Public Utilities Commission, which also provides water to many South Bay, East Bay and San Francisco Peninsula cities. The Marin Municipal Water District provides water to Marin County and its cities. The Sonoma County Water Agency provides water service to that county and some of its cities. In many Bay Area cities, wastewater is treated by municipally owned wastewater treatment plants. Cities and utility districts generally maintain sewage collection pipelines. Most cities also maintain storm drainage facilities.

Solid waste collection and disposal services and facilities are generally provided by private waste management services under franchise agreements with local jurisdictions.

Impact Discussion:

- a. *Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?* - **LS**

WT Backbone access site restrooms and boat washing facilities would generate small quantities of wastewater that would be treated at local municipal or regional sewage treatment plants. Because individual access site wastewater generation would be small (typically ranging from a few hundred to a few thousand gallons/day) and the sites would be dispersed throughout the Bay Area, the impact on any single treatment plant would be minimal (i.e. similar to the wastewater generation of a few houses). Therefore this impact would be less than significant.

- b. *Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?* - **NI**

See response to item a, above. The small amount of wastewater generated at any site would not require construction of new or expanded wastewater facilities.

- c. *Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?* - **LS**

Minor expansions of stormwater drainage facilities may be required at some WT access sites. Stormwater from these sites generally drains directly to the Bay, which minimizes the need for additional drainage facilities.

- d. *Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed? - LS*

WT Backbone access site restrooms and associated facilities would use small quantities of potable water that would be provided by municipal or regional agencies. Because individual access site water use would be small (typically ranging from a few hundred to a few thousand gallons/day) and the sites would be dispersed throughout the Bay Area, the impact on any single treatment plant would be minimal (i.e. similar to the water use of a few houses). Boat washing could use greater amounts of water, but the limited number of boats using a site on a daily basis would not consume significant quantities of water such that expanded water supply facilities would be required.

- e. *Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? - LS*

See responses to items a and b, above.

- f. *Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs? - LS*

Construction at, and use of the WT Backbone Sites, would generate small amounts of solid wastes, which would be collected and disposed of by many different providers at different landfills in the region. This small amount of solid waste would not substantively affect landfill capacities. In addition, most sites would have recycling receptacles in compliance with local solid waste reduction plans. This impact would not be significant.

- g) *Comply with federal, state, and local statutes and regulations related to solid waste? - NI*

The project would comply with all regulations regarding solid waste generation and disposal.

17. MANDATORY FINDINGS OF SIGNIFICANCE

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a threatened, rare or endangered species or eliminate important examples of the major periods of California history or prehistory?	X				
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	X				
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	X				

a) *Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a threatened, rare or endangered species or eliminate important examples of the major periods of California history or prehistory? PS*

As described above, the project could adversely affect sensitive species, including special status birds, marine mammals, and plant species and their habitats, as well as result in loss of cultural resources. These issues will be addressed in an EIR.

b) *Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)? PS*

As described above, cumulative development of the various access sites and use of the WT could result in potentially significant adverse impacts to wildlife, vegetation, aesthetics, cultural resources, and other resources. These issues will be addressed in an EIR.

c) *Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? PS*

The project could result in hazardous materials impacts. These will be addressed in the EIR.

APPENDIX A

Table 1: Locations and Descriptions of Backbone Sites

ID	Site Name	City	Category	Launch Type	Existing, or Planned?	HOS?
Alameda County						
A1	Albany Beach	Albany	waterfront park	sand beach	Exist. Launch	
A2	Berkeley Marina, Ramp	Berkeley	marina/harbor	ramp	Exist. Launch	Y
A4	Point Emery	Emeryville	waterfront park	sand beach	Exist. Launch	
A5	Shorebird Park	Emeryville	waterfront park	pebble beach	Exist. Launch	
A6	Emeryville City Marina	Emeryville	marina/harbor	ramp	Exist. Launch	Y
A8	Middle Harbor Park	Oakland	waterfront park	sand beach (A)	Exist. Launch	Y
A9	Jack London Square/CCK	Oakland	public boat launch ramp/float	float	Exist. Launch	Y
A11	Estuary Park/Jack London Aquatic Center	Oakland	waterfront park	ramp, float (A)	Exist. Launch	Y
A12	Grand Avenue Boat Ramp	Alameda	public boat launch ramp/float	ramp, float	Exist. Launch	Y
A14	Robert Crowne Memorial State Beach	Alameda	waterfront park	sand beach	Exist. Launch	Y
A15	Encinal Launching and Fishing Facility	Alameda	public boat launch ramp/float	ramp, float	Exist. Launch	Y
A18	Doolittle Drive; Airport Channel	Oakland	waterfront park	ramp	Exist. Launch	
A20	San Leandro Marina	San Leandro	marina/harbor	ramp, float	Exist. Launch	Y
A22	Eden Landing Ecological Preserve	Hayward	refuge/reserve	planned ramp	Planned launch	
A24	Jarvis Landing	Newark	privately owned (business)	ramp	Exist. Launch	
A25	Tidewater Boathouse	Oakland	public boat launch	planned float	Planned launch	

			ramp/float			
A26	Berkeley Marina, Small Boat Launch	Berkeley	public boat launch ramp/float	dock	Exist. Launch	Y
A27	Coyote Hills	Fremont	refuge/reserve	NA	Planned. Dest.	
A28	Elmhurst Creek	San Leandro	public access area	creek bank	Exist. Launch	
A30	Hayward's Landing	Hayward	refuge/reserve	NA	Planned. Dest.	
Contra Costa County						
CC1	Martinez Marina	Martinez	marina/harbor	ramp,float (A)	Exist. Launch	Y
CC2	Carquinez Strait Reg. Shoreline (Eckley Pier)	Martinez	waterfront park	pebble beach	Exist. Launch	Y
CC5	Rodeo Marina	Rodeo	marina/harbor	no access	Planned launch	
CC6	Pinole Bay Front Park	Pinole	waterfront park	pebble beach	Exist. Launch	Y
CC8	Point Molate Beach Park	Richmond	waterfront park	NA	Planned launch	
CC9	Keller's Beach	Point Richmond	waterfront park	sand beach	Exist. Dest.	Y
CC10	Ferry Point	Point Richmond	waterfront park	sand beach	Exist. Launch	Y
CC11	Boat Ramp Street Launch Area	Richmond	public boat launch ramp/float	ramp	Exist. Launch	
CC14	Richmond Municipal Marina	Richmond	marina/harbor	ramp,float	Exist. Launch	Y
CC15	Marina Bay Park & Rosie the Riveter Memorial	Richmond	waterfront park	riprap,dirt beach	Exist. Launch	
CC16	Shimada Friendship Park	Richmond	waterfront park	steps	Exist. Launch	Y
CC17	Barbara & Jay Vincent Park	Richmond	waterfront park	sand beach (A)	Exist. Launch	Y
CC19	Point Isabel Regional Shoreline	El Cerrito	waterfront park	dirt beach	Exist. Launch	Y
CC20	SS Red Oak Victory	Richmond	privately owned (business)	ship	Planned. Dest.	

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CC21	Point Pinole	Pinole	waterfront park	NA	Planned. Dest.
CC22	Bay Point Regional Shoreline	Martinez	waterfront park	NA	Planned launch
CC23	Rodeo Beach	Rodeo	waterfront park	sand beach	Planned launch

Marin County

M1	Kirby Cove	Sausalito	waterfront park	pebble beach	Exist. Dest.	Y
M2	Horseshoe Cove	Sausalito	waterfront park	sand beach	Exist. Launch	Y
M3	Swede's Beach	Sausalito	waterfront park	sand beach	Exist. Dest.	
M4	Turney Street Public Boat Ramp	Sausalito	public boat launch ramp/float	ramp	Exist. Launch	
M5	Dunphy Park	Sausalito	waterfront park	pebble beach (A)	Exist. Launch	Y
M6	Schoonmaker Point	Sausalito	waterfront park	sand beach (A)	Exist. Launch	Y
M8	Clipper Yacht Harbor	Sausalito	marina/harbor	ramp (A)	Exist. Launch	
M10	Shelter Point Business Park	Mill Valley	public boat launch ramp/float	float	Exist. Launch	Y
M11	Bayfront Park	Mill Valley	waterfront park	dirt beach, float (A)	Exist. Launch	Y
M13	Brickyard Park	Strawberry	waterfront park	dirt beach (A)	Exist. Launch	
M16	Richardson Bay Park/ Blackies Pasture	Tiburon	waterfront park	sand beach	Exist. Launch	
M17	Angel Island State Park	Marin County	waterfront park	sand beach	Exist. Dest.	Y
M19	Sam's Anchor Café	Tiburon	privately owned (business)	float	Exist. Dest.	
M25	Higgins Dock	Corte Madera	public boat launch ramp/float	no access	Planned launch	
M27	Bon Aire Landing	Larkspur	public boat launch ramp/float	float	Exist. Launch	
M28	Marin Rowing Association Boathouse	Larkspur	public boat launch ramp/float	float	Exist. Launch	

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M29	Ramillard Park	Larkspur	waterfront park	pebble beach	Exist. Launch	
M30	San Quentin	San Rafael	waterfront park	sand beach	Exist. Launch	
M31	Jean & John Starkweather Shoreline Park	San Rafael	waterfront park	sand beach	Exist. Launch	
M33	Harbor 15 Restaurant	San Rafael	privately owned (business)	ramp	Exist. Dest.	
M35	Loch Lomond Marina: Ramp	San Rafael	marina/harbor	ramp (A)	Exist. Launch	Y
M36	Loch Lomond Marina: Beach	San Rafael	marina/harbor	dirt beach	Exist. Launch	Y
M38	McNear's Beach	San Rafael	waterfront park	sand beach	Exist. Launch	Y
M39	China Camp State Park	San Rafael	waterfront park	sand beach (A)	Exist. Launch	Y
M40	Bull Head Flat	San Rafael	waterfront park	pebble beach (A)	Exist. Launch	Y
M41	Buck's Landing	San Rafael	privately owned (business)	float	Exist. Launch	
M43	John F. McInnis Park	San Rafael	waterfront park	float	Exist. Launch	
M47	Black Point Boat Launch	Novato	public boat launch ramp/float	ramp, float (A)	Exist. Launch	Y

Napa County

N1	Cutting's Wharf	Napa County	public boat launch ramp/float	ramp, float (A)	Exist. Launch	Y
N2	JFK Memorial Park	Napa	waterfront park	ramp, float (A)	Exist. Launch	Y
N6	Napa Valley Marina	Napa	marina/harbor	ramp	Exist. Launch	Y
N7	Green Island Boat Launch Ramp	American Canyon	public boat launch ramp/float	ramp	Planned launch	
N8	Riverside Drive Launch Ramp	Napa	public boat launch ramp/float	ramp	Exist. Launch	

Santa Clara County

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SC2	Alviso Marina	Alviso	waterfront park	planned ramp	Planned launch	
SC3	Palo Alto Baylands Launching Dock	Palo Alto	waterfront park	ramp, float	Exist. Launch	Y
San Francisco County						
SF1	Candlestick Point State Recreation Area	San Francisco County	waterfront park	sand beach	Exist. Launch	Y
SF2	India Basin Shoreline Park	San Francisco	waterfront park	pebble beach	Exist. Launch	Y
SF4	Islais Creek	San Francisco	waterfront park	pebble beach	Exist. Launch	
SF6	The "Ramp"	San Francisco	privately owned (business)	ramp	Exist. Dest.	
SF7	Pier 52 Boat Launch	San Francisco	public boat launch	ramp/float	Exist. Launch	Y
SF8	South Beach Harbor (AKA Pier 40)	San Francisco	marina/harbor	float	Exist. Launch	
SF9	Treasure Island	San Francisco	public access area	ramp	Exist. Launch	
SF10	Aquatic Park	San Francisco	waterfront park	sand beach	Exist. Launch	Y
SF11	Gas House Cove (aka Marina Green)	San Francisco	marina/harbor	float	Exist. Launch	
SF12	Crissy Field	San Francisco	waterfront park	sand beach	Exist. Launch	Y
SF13	Brannan St Wharf	San Francisco	public boat launch	ramp/float	NA	Planned launch
SF14	Northeast Wharf Park	San Francisco	waterfront park	NA	Planned launch	
San Mateo County						
SM2	Ravenswood Open Space Preserve	Menlo Park	waterfront park	sand beach	Exist. Launch	
SM4	Redwood City Municipal Marina	Redwood City	marina/harbor	ramp	Exist. Launch	Y
SM6	Docktown Marina	Redwood City	marina/harbor	ramp	Exist. Launch	
SM9	Redwood Shores Lagoon	Redwood Shores	waterfront park	dirt beach	Exist. Launch	

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SM11	Beaches on the Bay	Foster City	waterfront park	sand beach	Exist. Launch	
SM12	Foster City Lagoon Boat Park	Foster City	waterfront park	ramp	Exist. Launch	
SM13	East 3rd Ave	Foster City	waterfront park	sand beach	Exist. Launch	Y
SM16	Seal Point Park	San Mateo	waterfront park	ramp (A)	Exist. Launch	Y
SM17	Coyote Point, Marina	San Mateo	marina/harbor	ramp	Exist. Launch	Y
				sand beach,		
SM18	Old Bayshore Highway	Burlingame	public access area	riprap	Exist. Launch	
		S o S a n				
SM20	Colma Creek/Genentech	Francisco	public access area	creek bank	Exist. Launch	
		S o S a n				
SM21	Oyster Point Marina	Francisco	marina/harbor	sand beach, ramp, float	Exist. Launch	Y
SM22	Brisbane Marina	Brisbane	marina/harbor	riprap	Exist. Launch	Y
SM23	Coyote Point, Beach	San Mateo	waterfront park	sand beach	Exist. Launch	Y
SM24	Westpoint Marina	Redwood City	marina/harbor	ramp	Planned launch	
SM25	Corkscrew Slough Viewing Platform	Redwood City	refuge/reserve	dock	Planned. Dest.	

Solano County

So1	Brinkman's Marina	Vallejo	public boat launch ramp/float	ramp,float	Exist. Launch	Y
So2	California Maritime Academy	Vallejo	privately owned (business)	ramp	Exist. Launch	
			public boat launch			
So5	Beldon's Landing	Fairfield	ramp/float	ramp,float	Exist. Launch	Y
So7	Matthew Turner Park	Benicia	waterfront park	pebble beach	Exist. Launch	Y
So8	West 9th Street Launching Facility	Benicia	waterfront park	ramp,float	Exist. Launch	Y
So9	Benicia Point Pier	Benicia	waterfront park	pebble beach	Exist. Launch	Y
So10	Benicia Marina	Benicia	marina/harbor	ramp (A)	Exist. Launch	Y

So12	Suisun City Marina	Suisun City	marina/harbor	ramp,float	Exist. Launch	Y
 Sonoma County						
Sn3	Hudeman Slough	Sonoma County	public boat launch	ramp,float	Exist. Launch	
Sn5	Papa's Taverna/ Lakeville Marina	Petaluma	private (business)	ramp	Exist. Launch	Y
Sn6	Petaluma Marina	Petaluma	marina/harbor	ramp (A)	Exist. Launch	Y
Sn7	Petaluma River Turning Basin	Petaluma	public boat launch	ramp,float	float	Exist. Launch

APPENDIX C
SUMMARY OF SCOPING COMMENTS

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Scoping Hearing Oral Comments

A Notice of Preparation (NOP) for the San Francisco Bay Area Water Trail (Water Trail or WT) Environmental Impact Report (EIR) was issued for agency and public review on November 15, 2007. The NOP summarized the proposed scope of environmental analyses to be included in the EIR. A public scoping meeting on the proposed EIR was held in San Francisco on November 28, 2007. Scoping comments were accepted through December 23, 2007. This document summarizes the comments received during the scoping period and identifies changes in the EIR scope of work resulting from those comments.

Comments presented at the Scoping Hearing included the following (grouped by topic):

Comments Related to Baseline Conditions / Treatment of Existing Boating and Access Site Use

- In view of the fact that the sites and users both already exist, the EIR should distinguish impacts that would have happened anyway from those that result from the trail designation.
- The EIR should consider that existing access sites would be used, whether or not they are designated. The EIR should consider whether existing sites with wildlife impacts could therefore be removed from use via the Plan/EIR.
- EIR should identify a baseline of users as clearly as possible and recognize that this changes with population. The EIR should address what would happen in the future (i.e., increased bay usage by small non-motorized boats) without the project and what is happening in addition as a consequence of the WT.
- Although this is a programmatic document to be tiered, it should be quantitative. The EIR should use available analytical tools. It should compare the project's impacts with those of the no-project alternative.

Comments Related to Benefits of Proposed WT

- The Water Trail Plan is of positive benefit in providing recreational opportunities and for controlling wildlife impacts.
- Bay Access sees this project as highly positive. Some of the positive aspects, (eg. providing onsite storage produces fewer [vehicular] trips, or minimizing trips to more distant locations for boat recreation while increasing trips to nearby locations), are very easy to quantify. Others are speculative. The EIR should look at the positive aspects and compare the positives and negatives overall.
- The EIR should consider the positive effects of the Plan that may be outside the project area.
- The EIR should consider that the public should be educated about the value of recreation. Some communities need more recreation than others. EIR should

address the positive effects of recreation on public health, as well as other positive effects.

- Does the CEQA process try to balance the effects? For example if there are blue porta-potties [that are ugly], does this offset the effects of improved water quality?
- WT Access sites in a high population density area would benefit more people. Therefore there should be a larger number of sites in high-density areas. The same is also true for onsite storage (i.e., more boat/equipment storage onsite in sites in densely populated areas would benefit a greater number of people). The benefits are even greater when dragon boats and large youth groups can be accommodated.

Comments Related to Biological Resources, including Monitoring, Agency Oversight, Habitat Fragmentation, and Trail Closures

- The EIR should discuss how project impacts, including access impacts will be monitored.
- The EIR should discuss impacts of habitat fragmentation due to access and use of the facility.
- The EIR should note that several different management agencies would need to have input over which sites are designated.
- If there was the possibility of seasonal closures of trailheads, this trail system could be a very effective method of informing people about potential effects to wildlife.
- The EIR should consider that, while most users are educated and would not disturb birds, some would not take such care.

Comments Related to Education and Stewardship

- The designation of sensitive sites provides the opportunity to educate. Not designating a trailhead is not [an effective] mitigation; sensitive sites should not be excluded from the Plan.

Comments Related to Trail Use

- The EIR should consider the impacts of non-WT trailhead users (eg. motor boaters) compared with WT users.
- The EIR should distinguish between boaters in general and WT users.
- The CEQA process should evaluate the environmental impact of attracting people to one place rather than another.

Comments Relating to Information from Other Agencies

- When the EIR is describing the affected environment, it should consider data available from other agencies. The GGNRA has 4 access sites and substantial available data on various resources.

- The EIR should include a discussion of the use of historic ships for overnight accommodation (of which there are three). All most sites need is a float for a dock.

Summary of Written Comments in Response to NOP

In addition to the above comments, comment letters in response to the Notice of Preparation were received from the following individuals, organizations, and agencies:

- *Jim McGrath (November 28, 2007 letter):*
 - Requests that the EIR studies consider impacts of boating use in the context of the entire Bay.
 - Requests that the EIR consider impacts in the context of pre-existing boating use (including all types/sizes of boats/ships).
 - Requests that the EIR consider impacts in the context of pre-existing recreational boating use (including all boats/marinas around the Bay).
 - Requests that the EIR consider impacts in the context of pre-existing boating use (including all types/sizes of boats/ships).
 - Requests that the EIR identify the potential for increased use at the sites that would result from Plan implementation.
 - Requests that the EIR consider existing use as a right under the Public Trust Doctrine.
 - The EIR must establish clear thresholds of impact significance that distinguish between impacts likely to occur absent the project and those resulting from project implementation.
 - Prefers including sensitive sites in the WT Plan to gain the benefit of education/outreach rather than excluding them.
 - Requests consideration of population-wide impacts of boating disturbance of local groups of rafting birds. Asserts that there would need to be thousands of kayaks to significantly affect rafting bird populations.
 - Requests quantified analyses where possible. Notes that an EIR that considers all future increases in boating/associated impacts as resulting from the project would be inadequate.
 - Recommends that the EIR focus on how inclusion of existing sites in the WT would reduce impacts compared with continued use of the sites without such designation.
 - The EIR should address potential impacts of possible new sites in San Pablo Bay, Suisun Bay, and the South Bay, as well as new overnight facilities.
- *Jim McGrath (December 4, 2007 letter):* EIR should consider seasonal boater use difference in developing mitigations. A possible approach is to consider/analyze commercial kayak rentals.

- *San Francisco Bay Area Water Transit Authority (John Sindzinski, December 3, 2007 email):* Identifies overlap of proposed ferry terminal locations and proposed access sites. Requests coordination and exploration of methods for avoiding conflicts between ferry operations and WT use.

- *Marin Audubon Society (Barbara Salzman/Phil Peterson, December 18, 2007 letter):*
 - The DEIR should include a list/map of potential sites in the 112 Backbone site pool, and identify existing biological conditions on the sites and vicinities. [Note: all 112 sites are considered potential sites].
 - HOS sites also should be identified and continued use/expansion of these sites evaluated with respect to habitats and biological constraints.
 - Baseline biological conditions in the EIR should include wetlands and shorelands habitats for endangered species, use of water areas for rafting birds, use of inter-tidal flats by foraging shorebirds, use of shorelines by marine mammals and roosting shorebirds, and other nesting and foraging birds. The EIR should conduct surveys as necessary.
 - How will the EIR reconcile the seemingly conflicting goals of attracting more people to the trail and teaching them to protect wildlife and foster stewardship? How will the effectiveness of the education program be assured?
 - The project description should describe the education program in detail, on land and water, and describe how monitoring and enforcement will be performed.
 - Authority of local governments to enforce WT protections for wildlife should be addressed. Availability of local agency funding and staffing for monitoring and enforcement also should be considered.
 - The EIR should include a range of possible actions to be implemented if monitoring shows adverse behaviors, including ticketing, seasonal closures, prohibition of use, and permanent closures. Enforcement action triggers should be identified.
 - The EIR impacts analyses should address effects of trail use on wildlife and habitats. Loss of habitats from construction activities should be addressed, and mitigation identified.
 - The presence of people causing disturbance to wildlife by boating on/through slough and open-water habitats used by rafting waterfowl, boating near wetlands used by endangered species and shorebirds, and shorelines used by harbor seals for pupping and resting, and for birds and special-status species for high tide roosting should be addressed. Impacts of increased boat use (including litter, noise, boat haul-out) on these areas/habitats/species should be considered.
 - Impacts of overnight camping facilities, including land coverage and noise, should be addressed.

- Cumulative impacts should be addressed for all of the above.
 - The evaluation should consider potential effectiveness of specific components of the WT program and of the overall program, including the likelihood of avoiding adverse effects.
 - Avoidance should be the mitigation of choice. Other mitigation measures should include: establishing clear behavior standards, limiting the number of launches, ticketing (citations) or prohibition of use for multiple infractions, seasonal closure of sites during nesting or over-wintering season, and the need for permanent closure.
 - The procedure for determining appropriate ongoing mitigations should be addressed. The Plan should include mitigations that will avoid impacts from the start. For example, launch sites in close proximity to endangered species habitats should be excluded from the plan rather than subject to future mitigation actions.
 - The DEIR should include, in addition to the No Project Alternative, an alternative that includes all of the mitigation measures mentioned above as well as those suggested by others, to avoid and/or significantly reduce Plan impacts.
-
- *Contra Costa County Public Works Department (Rich Shimano, December 12, 2007 letter):* identifies jurisdiction location errors in the Plan. Request specific signage criteria. Requests that each site be studied to determine if adequate turning radii are provided at vehicle entrances/exits and internal roadways/intersections for the largest vehicle-trailer combination at the site. Add mitigation measures for insufficient turning radii.
 - *California Public Utilities Commission (Kevin Boles, December 13, 2007 letter):* EIR should consider safety factors associated with at-grade railway crossings to access the sites, including on-site meetings with all potential stakeholders.
 - *City of Hercules (Robert Reber, December 17, 2007 letter):* Notes that there are no sites currently indicated in Hercules and that the City is interested in future opportunities for sites in Hercules to be included in the Plan.
 - *California Department of Transportation (Timothy Sable, November 28, 2007 letter):* Requests that the EIR evaluate impacts on adjacent state highways by assessing if a Traffic Impact Study is warranted (letter includes study warrant screening criteria). Notes that work or traffic control in State right of way will require an encroachment permit from Caltrans.
 - *California Department of Transportation (Kit Stycket, December 6, 2007 email):* Notes that discretionary permits/encroachment permits may be required from Caltrans.

Requests coordination between project and Caltrans because many Caltrans projects include shoreline public access components.

- *Beth Huning, Water Trail Steering Committee (November 27, 2007 memo):*
 - EIR should evaluate any additional biological resources impacts and cumulative impacts, including directing boaters away from sensitive biological resources.
 - Project impacts on harbor seals, waterbirds, shorebirds, and other wildlife and habitats should be addressed. “Sneak” impacts, habitat fragmentation, seasonal closures, and travel route locations should be addressed
 - Sites should be evaluated with respect to proximity to sensitive wildlife areas.
 - Impacts of trail use on wildlife should be addressed.
 - Water trail should remain voluntary. Local land managers should make access recommendations.

- *Paul Nixon, Bay Access (undated letter)*
 - EIR should consider social, health, physical, and mental benefits of enhanced recreational activities, especial among certain disadvantaged socio-economic groups.

- *San Francisco Bay Conservation and Development Commission (Sabrye Cohen, December 26, 2007 letter)*
 - Letter identifies relevant BCDC plans and policies, and discusses Plan compliance with those policies.
 - EIR should discuss sea level rise impacts to new facilities.

- *East Bay Regional Park District (Brad Olson, December 20, 2007 letter)*
 - Existing sites should be considered part of baseline conditions. No subsequent environmental review should be required for HOS sites.
 - Project may involve use or motorized vessels for safety/education/rescue operations. Plan/IS should describe how unauthorized motorized boating will be excluded from sites.
 - The EIR should include visual significance thresholds and should address impacts to and from the Bay.
 - The EIR biology section should address salt marsh harvest mice.
 - EIR cultural resources sections should acknowledge that archaeological resources could be uncovered by erosion and the project could increase access to those sites.

- Hazardous Materials: The EIR should consider routine transport, use, and disposal of hazardous materials associated with construction.
- EIR should address water pollutants associated with increased motorboat use associated with the project.
- EIR should address death by drowning impact issues inherent to small boating uses, especially in storms. Would the WT increase this hazard?
- Add California Department of Parks and Recreation as landowner; address Santa Clara County HCP.
- EIR should address staging and access impacts due to operations and facility development.
- Increased demand and costs for rangers and operations should be addressed.
- Parking requirements for various watercraft should be identified.
- EIR should address alternative transportation access to sites.
- EIR should address utilities and service upgrades associated with facility upgrades. Land disturbance issues on water quality should be addressed.

APPENDIX D
LIST OF STRATEGIES

WATER TRAIL MANAGEMENT STRATEGIES FROM 2007 DRAFT WATER TRAIL PLAN	
STRATEGY	PURPOSE AND APPLICATION
<p>1. Trail Head Location</p> <p>Seek opportunities to increase use capacity at existing launches, or create new access for human-powered boats and beachable sail craft.</p> <p>Prioritize these efforts at sites that are close to desirable non-motorized small boating conditions and trip destinations, and in areas where trail-related adverse impacts to wildlife and habitat or navigational safety are unlikely.</p> <p>In all cases, new and expanded access should be sited to avoid or minimize significant adverse impacts to wildlife and habitat.</p>	<p>This strategy supports the primary goal of the Bay Area Water Trail; to improve opportunities for people in human-powered boats and beachable sail craft to enjoy point-to-point trips on the Bay.</p> <p>The recommended priorities for trail head location:</p> <ul style="list-style-type: none"> ▪ increase opportunities for boaters to enjoy the trail ▪ reduce trail impacts near trail heads ▪ reduce the number of users visiting sensitive wildlife areas because reaching these areas is more difficult <p>Examples of how this strategy applies include:</p> <ul style="list-style-type: none"> ▪ locate new trail heads or increase capacity at existing sites in areas that are good for training new boaters ▪ locate new trail heads away from sensitive wildlife and habitat areas, and avoid increasing capacity at existing sites in these areas unless the site can be adequately managed to avoid impacts ▪ create new or increased access at sites that can draw trail users away from identified sensitive wildlife and safety areas
<p>2. Linking Access Points</p> <p>Seek opportunities to link trail heads to each other and with access to other regional trails (e.g. the Bay Trail) and create linkages that serve different trail users' needs and interests (e.g. different skill levels, viewing nature, learning about cultural or historic features of the Bay Area, etc.).</p>	<p>This strategy facilitates point-to-point trips and varied and interesting access experiences. Furthermore, it promote safe boating conditions by providing sites for boaters to take breaks and seek assistance if needed.</p> <p>To create a usable linkage between sites for most human-powered boaters, trail heads should be ~3 miles apart. Strong boaters may be able to travel much greater distances without a break, but under some conditions (e.g. strong currents), 3 miles is too far.</p> <p>Appropriate distances between sites with overnight accommodations are longer (e.g. ~8 miles) because boaters do not need to make a return trip on the same day. These site-specific considerations should be factored into the analysis of linkage opportunities for a trail head.</p> <p>Trail managers should also assess whether efforts to develop or incorporate a trail head to create a site-to-site linkage will increase the chances of sites being near sensitive wildlife areas or safety areas. Developing linkage opportunities should not be done at the expense of these other trail priorities.</p> <p>Natural conditions and shoreline ownership in some areas of the Bay will preclude creating these types of site-to-site linkages.</p>

WATER TRAIL MANAGEMENT STRATEGIES FROM 2007 DRAFT WATER TRAIL PLAN	
STRATEGY	PURPOSE AND APPLICATION
<p>3. Improvements Consistent With Site Characteristics</p> <p>Match the type and design of trail-related improvements to the site conditions (e.g. shoreline morphology, habi-tats, predominant wind and wave conditions, other uses of the site, etc.) and likely trail user groups.</p> <p>Ensure that the level of use that a site accommodates is consistent with providing a high-quality recreational experience, protecting environmental resources at the site and in surrounding areas, and preserving the safety of water users.</p>	<p>The diversity of the San Francisco Bay shoreline demands a flexible approach to trail head development. Making improvements consistent with site conditions achieves a variety of objectives:</p> <ul style="list-style-type: none"> helps preserve the character of the trail head setting increases the quality of boaters' experiences ensures access is available to a broad spectrum of trail users avoids uses of the site that are incompatible with safe boating, wildlife, habitat and water quality protection can avoid user conflicts <p>Implementation of this strategy should occur during site assessment and planning.</p>
<p>4. Consistency With Policies, Plans and Priorities</p> <p>Coordinate plans for trail head development, management and use to be consistent with existing policies, plans and priorities of land and resources managers at and around trail heads.</p> <p>Coordinate trail signage and access design guidelines, and education programs to be consistent with existing policies, plans, standards and programs</p>	<p>This strategy facilitates development of trail heads at a diversity of shoreline areas (e.g. parks, marinas, wildlife refuges and protected areas, private lands, etc.)</p> <p>Coordination for specific trail heads should be done by launch site managers during site assessment and planning for trail head designation.</p> <p>Trail staff and/or any water trail partners that take the lead in developing signage and access design guidelines and education should coordinate these efforts to be consistent with existing policies, plans, standards and programs.</p>
<p>5. Design Guidelines</p> <p>Develop and update, as needed, design guidelines for trail-oriented access improvements.</p>	<p>To address the needs of all trail users, design guidelines should be developed that facilitate consistently durable, accessible and functional facilities.</p> <p>These guidelines will also assist local governments and others striving to improve trail access, by providing clear guidance on good facility design for non-motorized small boating uses.</p> <p>The California Department of Boating and Waterways will develop these guidelines in coordination with water trail staff, other agencies and trail user groups.</p>

WATER TRAIL MANAGEMENT STRATEGIES FROM 2007 DRAFT WATER TRAIL PLAN	
STRATEGY	PURPOSE AND APPLICATION
<p>6. Management Resources</p> <p>Match the facility improvements and use to the management resources (including staff and funding) available for long-term maintenance of facilities and signage, and provision of other site-specific management needs such as, enforcement, monitoring, and education and outreach programs.</p>	<p>Good site management prevents most problems, and this strategy helps ensure that the managing organization can successfully operate and maintain the site long-term.</p> <p>Additionally, this approach avoids establishing uses at a site (e.g. camping) that might overwhelm available management resources and lead to problems.</p> <p>Trail managers will provide input on this consideration during site assessment and planning, but in almost all cases, launch site owners and managers are best able to assess management resource constraints, and to recommend appropriate improvements and use levels for their sites within these limitations.</p>
<p>7. Maintenance and Operations</p> <p>Develop a plan for trail head facility maintenance and operation, and identify who will be responsible.</p>	<p>Maintenance of trail heads is important for protecting public safety and satisfaction with trail access opportunities.</p> <p>Maintenance and operation plans should be developed by launch site managers during site assessment and planning for trail head designation. Ideally, these plans will not create extra work because they are already required of site managers and owners in applications for permits or funding.</p>
<p>8. Parking</p> <p>Provide parking or drop-off zones as close as possible to launch points (e.g. ramp), and extend parking time limits to a minimum of four hours.</p> <p>Provide overnight parking where possible.</p> <p>When appropriate, restrict vehicle parking to limit the number of users to a level that is appropriate for the site consistent with Strategy 6.</p> <p>Locate parking to protect shoreline visual character.</p>	<p>Sufficient, long-term parking is an essential component of trail access because most boaters must bring their equipment to a launch site. Drop-off spots and parking near to the launch are also desirable because they reduce the distance that boaters need to carry their gear.</p> <p>It may be feasible and appropriate at some trail heads to restrict parking as a tool to prevent over-use of a site.</p> <p>For trail head designations involving new facility improvements, launch site managers and trail managers should incorporate trail-related needs into the design of the parking.</p>
<p>9. Restrooms</p> <p>Provide restroom facilities where feasible and appropriate.</p>	<p>Despite costs and maintenance requirements, providing restrooms at the majority of trail heads is important to:</p> <ul style="list-style-type: none"> avoid degradation of water quality protect visitors and wildlife from exposure to human waste

WATER TRAIL MANAGEMENT STRATEGIES FROM 2007 DRAFT WATER TRAIL PLAN	
STRATEGY	PURPOSE AND APPLICATION
<p>10. Accessibility Develop and improve launch facilities to be universally accessible.</p>	<p>Trail head facilities should be made accessible to trail users with disabilities and people of all abilities.</p> <p>In designing accessible facility improvements or entirely new facilities as part of trail head designation, launch site managers should seek guidance from the access design guidelines (Strategy 5) and the water trail Advisory Committee (see Section 7).</p>
<p>11. On-Site Equipment Storage Where feasible and appropriate, provide storage areas and facilities for human-powered boating and beachable sail craft equipment (e.g. boat house, modified shipping container, fenced areas, or inside tie dockside storage at marinas).</p>	<p>This strategy helps:</p> <ul style="list-style-type: none"> decrease economic barriers to participation facilitate trail usage among urban residents reduce the need for access to the site via car and demand for scarce parking if the trail head is accessible by public transportation <p>Inclusion of storage depends on the launch site setting and the constraints of the owner, based on factors such as costs and potential rental space revenues, liability risks, and compatibility of storage structures with site characteristics (Strategy 3).</p>
<p>12. Non-Profit Boating Clubs and On-Site Equipment Concessions Promote and encourage publicly-accessible non-profit boating clubs and/or on-site equipment concessions at appropriate trail heads.</p> <p>Boating clubs and concessionaires should provide outreach information and education to clients on site-specific safety and security, and wildlife and habitat issues. They should manage activities in a manner that is compatible with other site uses.</p>	<p>Boating clubs that offer the public cooperative group ownership or use of equipment, and for-profit equipment concessionaires can help:</p> <ul style="list-style-type: none"> facilitate trail usage among urban residents reduce the need for access to the site via car and demand for scarce parking if the trail head is accessible by public transportation with launch facility management <p>Where the trail is involved in planning for concessions or clubs – through the trail head designation process – planning considerations should include:</p> <ul style="list-style-type: none"> minimizing disruptions to other activities at the site and preventing concessions or clubs from over-running site facilities or displacing other activities required support structures and their impacts

WATER TRAIL MANAGEMENT STRATEGIES FROM 2007 DRAFT WATER TRAIL PLAN	
STRATEGY	PURPOSE AND APPLICATION
<p>13. Overnight Accommodations</p> <p>Develop new campsites at or near trail heads where consistent with land managers' plans and resources.</p> <p>Coordinate with land managers, organizations and businesses to provide overnight accommodations on the trail in motels, hostels, historic ships, etc.</p>	<p>Trail head overnight accommodations allow boaters to take multi-day trips – a major trail goal. This increases the tourism value of the trail, provides local residents with opportunities for local vacations, and offers opportunities for the water trail to partner with businesses. An appropriate linkage distance between sites with overnight accommodations is approximately 8 miles.</p> <p>Developing camping at trail heads introduces a variety of management challenges, and site managers should work with the water trail Project Management Team and the Advisory Committee to identify trail-related issues and solutions, such as:</p> <ul style="list-style-type: none"> proper site use and site security ongoing management and maintenance needs
<p>14. Site Review</p> <p>Conduct, coordinate or sponsor periodic reviews of trail heads to identify site-specific issues such as user conflicts, overuse of facilities or non-compliance with rules.</p> <p>Use information from these reviews to improve site management or facilities.</p>	<p>Site review helps water trail staff and site managers recognize trail-specific problems that need intervention, and take action in a timely manner.</p> <p>In general, launch site managers are aware of major issues at their sites. As trail head managers, this awareness should extend to trail-specific issues: access for non-motorized small boaters, and trail-related safety, wildlife, habitat and education concerns. This may require occasional check-ins with trail users, site volunteers and wildlife or safety stakeholders and experts.</p> <p>If major trail-related problems arise, trail head managers should coordinate with water trail staff on management changes, and seek advice from the water trail Advisory Committee.</p>
<p>15. Habitat Restoration and Access</p> <p>Seek opportunities to coordinate trail head development, with habitat restoration, enhancement or creation.</p>	<p>At locations with the right combination of physical site characteristics and management capacity (i.e. the agency or organization has expertise, resources and a mission consistent with active habitat restoration and protection, as well as providing access), this strategy potentially provides benefits for both habitat and access goals.</p>

WATER TRAIL MANAGEMENT STRATEGIES FROM 2007 DRAFT WATER TRAIL PLAN	
STRATEGY	PURPOSE AND APPLICATION
<p>16. Monitoring Impacts</p> <p>Sponsor pilot projects to monitor trail impacts in different habitats to develop and test effective and consistent monitoring methods and learn about impacts and ways to avoid them.</p> <p>Monitor wildlife and habitat conditions prior to, during and after inclusion of the site as part of the trail.</p>	<p>By improving understanding of trail impacts, this strategy helps trail and site managers develop effective management policies, and education and outreach information. Monitoring results might assist in species and habitat mapping and identification of sensitive wildlife areas.</p> <p>This strategy should be applied selectively to trail heads where wildlife and habitat impacts are a major concern. Water trail staff should seek input from the Advisory Committee on which prospective trail heads to consider for pilot monitoring. Site monitoring should be designed and implemented in a scientifically sound manner, and with the primary objective of informing trail and site managers about trail-related impacts.</p> <p>Due to the potential costs of monitoring, trail head owners and managers are unlikely be able to (nor wish to) fund these efforts. The water trail project will probably need to seek and allocate funding for this monitoring, and seek partnerships with researchers to conduct studies.</p>
<p>17. Outreach, Educational and Interpretive Signage</p> <p>Provide signage and other media at and near trail heads that are both consistent with other trail outreach and education materials, and specific to the sites in terms of their user groups, natural, cultural and historic resources, safety issues and rules. For example, a trail head could have a kiosk with multi-lingual, site specific tide/current information, and interpretive panels and brochures on wildlife and habitat in the area.</p>	<p>Signage is an integral part of the water trail education, outreach and stewardship program. It is not a cure-all for trail education needs, but it helps:</p> <ul style="list-style-type: none"> make launch sites recognizable as trail heads provide site-specific information that helps trail users have positive and interesting boating experiences, protect wildlife and habitat and boat safely improve users' knowledge of effects of their actions and reduce damaging or unsafe user behavior increase compliance with rules by providing explanations of reasons behind site policies foster public support for the trail and specific trail heads <p>Developing trail head signage is part of the trail head designation process – unlike many other strategies, this one applies to all sites on the trail.</p> <p>Signage should be consistent with guidelines and formats provided in the water trail signage program (see Section 9.1). The Coastal Conservancy will take the lead for developing this signage program.</p> <p>Additionally, site specific content for trail head signage should be developed in coordination with trail managers and with input from the water trail Advisory Committee.</p>

WATER TRAIL MANAGEMENT STRATEGIES FROM 2007 DRAFT WATER TRAIL PLAN	
STRATEGY	PURPOSE AND APPLICATION
<p>18. Outreach and Coordination Coordinate with and conduct outreach to paddleboat and boardsailing teachers and guides, outfitters, other businesses and agencies and organizations involved in the trail to make them aware of boating practices that are consistent with the water trail ethic and other trail policies.</p>	<p>Outreach to people and organizations that are already connected with paddleboaters and boardsailors is an efficient way to reach a broad audience of trail users – including tourists and novice boaters – and this outreach can foster support for the trail among businesses and agencies. Furthermore, this coordination can help trail staff learn about education techniques that are effective in achieving positive behavior changes among trail users. Outreach and coordination is also an essential means of promoting consistent trail-related information throughout the Bay Area.</p>
<p>19. Educational Media</p> <p>Guidebook Provide a comprehensive and up-to-date guide for using the water trail.</p> <p>Trail Website Provide a comprehensive and up-to-date website for the water trail. Post (or link to) current information on trail –related wildlife, habitat and water quality, boating safety and security conditions.</p> <p>Other Trail Media Provide brochures, maps, and other educational media.</p>	<p>Like signage, media are essential components of the trail education, outreach and stewardship program. The information in a guidebook, website and brochures:</p> <ul style="list-style-type: none"> facilitates better trip preparation by providing general and site-specific information (e.g. site maps and information about boating facilities, conditions, rules, fees, etc.) improves users’ knowledge of the implications their actions, and reduces damaging or unsafe user behavior <p>The website, in particular, enables water trail staff to inform trail users of current trail conditions (e.g. weather conditions, currents and tides) and usage guidelines or requirements (e.g. marine events, areas to avoid due to sensitive wildlife or poor water quality)</p> <p>The guidebook, brochures and website are promotional tools that can foster support for the trail among land managers, businesses, funding agencies and organizations, and the public.</p> <p>Initial development and funding for these educational materials, and future updates will require significant resource commitments from the water trail education staff. Development of the maps and information in these media should be coordinated. Staff should seek input from the Advisory Committee and other stakeholders and experts on general and site-specific educational information.</p>
<p>20. Guided Trips Provide guided trips or tours led by docents or rangers.</p>	<p>Offering guided trips can improve trail educational experiences for participants. Personal contact with experienced boaters can be a particularly effective educational approach. Guided trips are a good way for novice boaters and tourists to safely enjoy the trail. This strategy also offers better control over undesirable user behavior in sensitive wildlife and safety areas.</p> <p>Implementing this strategy requires extensive resources and expertise to lead trips or organize and train docents. Trail staff should work with agencies, organizations and businesses that already offer these trips to coordinate educational messages in the programs and expand trip offerings as feasible.</p>

WATER TRAIL MANAGEMENT STRATEGIES FROM 2007 DRAFT WATER TRAIL PLAN	
STRATEGY	PURPOSE AND APPLICATION
<p>21. Boater-to-Boater Education</p> <p>Coordinate with agencies and boating organizations to facilitate and enhance existing boater-to-boater outreach and education efforts, and incorporate trail-supported information and messages.</p> <p>Train volunteers and water trail staff as trail stewards to conduct boater-to-boater education and outreach at and near trail heads, especially during high-use times of year.</p>	<p>Boater-to-boater outreach is an active educational approach that is more likely than other water trail education, outreach and stewardship program components to lead to positive behaviors among the water trail users who are contacted.</p> <p>Organizing volunteers and staff and coordinating with other organizations to implement this strategy requires significant staff support. Efforts to develop boater-to-boater education should focus first on coordination with others so that benefits might be more easily achieved. This might also give staff insights into best locations and effective methods for a water trail-managed docent program.</p> <p>To optimize the positive impacts of boater-to-boater education, staff should focus these efforts near popular trail heads during high-use times of year, and where trail safety and wildlife issues are major concerns.</p>
<p>22. Trail Head Stewards</p> <p>Recruit and coordinate volunteers to be trail head stewards who help maintain trail heads by doing or organizing site clean-ups, and helping managers do site check-ins (Strategy 14).</p>	<p>Similar volunteer programs in which stewards “adopt” a site have been very successful for other water trails. In addition to providing needed assistance for some trail head owners and managers, the program helps create a core group of water trail members who are committed to maintaining, improving and advocating for the trail.</p> <p>Managing a stewards program requires significant staff time. Education, outreach and stewardship efforts that focus on signage, outreach and coordination with existing programs and educational media should take priority over developing a site stewards program.</p>
<p>23. Training for Enforcement</p> <p>Where feasible and appropriate, provide training to local law enforcement on wildlife and environmental regulations (e.g. Endangered Species Act, Migratory Bird Act) in order to identify or prevent violations of these regulations at trail heads.</p>	<p>If local law enforcement agencies are receptive to this type of training, this strategy could improve protection of wildlife and habitat at or near trail heads by leveraging existing enforcement efforts. This also might help trail managers form partnerships with local law enforcement.</p>

WATER TRAIL MANAGEMENT STRATEGIES FROM 2007 DRAFT WATER TRAIL PLAN	
STRATEGY	PURPOSE AND APPLICATION
<p>24. Limitations on Trail Head Use</p> <p><i>Limits on the Number of Users</i></p> <p>Establish limits on the number of trail users at a site to prevent identified problems such as significant impacts to wildlife and habitat, or damage to facilities</p> <p>Use parking restrictions (e.g. limited number of parking spaces and/or time limits) as a means of limiting number of users at a site</p> <p><i>Restrictions to Boating Activities</i></p> <p>Limit activities at a trail head or on the water to specific types of trail uses or establish site-specific rules for visitors using non-motorized small boats (e.g. a boating corridor) to prevent identified problems such as potentially significant impacts to wildlife and habitat, or damage to facilities</p> <p><i>Closing Access</i></p> <p>To protect sensitive wildlife or habitat resources at trail heads or locations accessible from trail heads, establish periodic closures based on time of day, season or tidal regime</p>	<p>These strategies that limit trail head use are potential methods for addressing access, wildlife or safety problems at a site. Ideally, implementation of other management approaches that avoid limiting trail access will resolve trail head problems. In some instances, though, these strategies may be appropriate ways to:</p> <ul style="list-style-type: none"> decrease wear and tear on facilities reduce conflicts among different user groups reduce significant adverse effects on wildlife and habitat and water quality allow for habitat recovery ensure safe boating conditions for all water users <p>It is important to recognize that use limitations can have potentially significant negative affects on Bay Area boaters by depriving them of opportunities to access the Bay and enjoy various benefits associated with being on the Bay.</p> <p>Trail head managers and owners are responsible for implementing these strategies, and the decision to do so is up to them and the constraints that they have, such as site policies and plans, and funding commitments.</p> <p>Proposals (by trail head managers or others) to limit access at a trail head should be brought to trail staff, the Project Management Team and the Advisory Committee for input. Ultimately, if there is disagreement between the trail head managers and water trail project managers about limiting trail use, the Project Management Team can choose to un-designate the trail head.</p> <p>In considering access limitations, managers should analyze and compare expected benefits with likely negative access impacts and the resource requirements to educate visitors about restricted access and enforce these rules.</p>

APPENDIX E
PRELIMINARY ENVIRONMENTAL EFFECTS CHECKLIST
FOR TRAILHEAD DESIGNATION PROCESS

PRELIMINARY DRAFT

SAN FRANCISCO BAY AREA WATER TRAIL ENVIRONMENTAL EFFECTS CHECKLIST

This preliminary draft checklist is an important part of the Trailhead Designation Process and is intended to guide environmental review of trailhead designation for potential Water Trail sites, and to help identify mitigation measures that have been identified at the programmatic level and that may apply to a specific site. Further CEQA review and/or development of site-specific mitigation measures may be required if mitigation for certain potential impacts has not been developed at the programmatic level. If this checklist does not meet all needs during the Trailhead Designation process, it can either be modified or the Summary of Potential Impacts and Mitigation Measures presented in the Executive Summary (Table ES-1) and the full text of the EIR may be used instead.

For many resource areas, no potentially significant impacts were identified, either during the development of the Initial Study or as part of the development of this DEIR. Those resource areas for which evaluation was completed during the development of the Initial Study, or for which no potentially significant impacts were identified in the EIR, are not included in the checklist. The resource areas included in this checklist are:

- Recreation
- Navigation
- Aesthetics
- Biological Resources
- Cultural Resources
- Hydrology and Water Quality, and
- Transportation, Circulation, and Parking

Table E-1 clarifies which of the potential impacts for these resource areas would be mitigated as part of implementing the Water Trail program or mitigated at the site-specific level, or both.

The checklist follows Table E-1.

PRELIMINARY DRAFT

TABLE E-1. SUMMARY OF POTENTIAL IMPACTS AND ASSOCIATED MITIGATION

Impact Number	Impact Name	Significance Before Mitigation	Mitigation Number	Mitigation Name	When Applied¹	Significance After Mitigation
Rec-4	Conflict with, and Preclusion of Existing Recreation Activities Due to Facility Improvements and Use of WT Sites, or Increased Boating	PS	Rec-M4A	Web-Based Comment Form	WT Program	LTS
			Rec-M4B	Conduct Recreational Use Surveys and Develop/Implement Adaptive Management Recommendations	Site-Specific	
			Rec-M4C	Safety Signage	Site-Specific	
Nav-1	Increased Risk of Incidents Including Accidents Involving Loss of Life, or Collisions between NMSB Users and Other Boats	PS	Nav-M1A	Develop and Implement Safety Signage	Site-Specific	LTS
			Nav-M1B	Sponsor WT Training and Education Programs	WT Program	
			Nav-M1C	Design of WT Sites near Commercial Shipping and Ferry Terminals	Site-Specific	
			Nav-M1D	Planning of Wildlife Buffer Zones	Site-Specific	
Aesth-1	Degradation of Visual Quality of a WT Site or Its Surroundings	PS	Aesth-M1	Include Visual Characteristics and Site Relationships in Design Guidelines and Trailhead Plans	Both	LTS
Bio-1	Spread of Non-Native Invasive Plants	PS	Bio-M1	Conduct Education and Spread-Reduction Efforts	Both	LTS
Bio-2	Wetland Habitat Impacts due to Construction, Repair, Rehabilitation, or Maintenance of Trailheads	PS	Bio-M2	Conduct Evaluations, Adopt Avoidance Measures, and Instigate Compensatory Mitigation	Site-Specific	LTS
Bio-3	Wetland Habitat Impacts Due to Increased Trampling of Wetland Shoreline Vegetation and Soil	PS	Bio-M3	Establish Trailhead Restrictions, Public Education, Surveys, and Signage	Both	LTS

PRELIMINARY DRAFT

TABLE E-1. SUMMARY OF POTENTIAL IMPACTS AND ASSOCIATED MITIGATION

Impact Number	Impact Name	Significance Before Mitigation	Mitigation Number	Mitigation Name	When Applied¹	Significance After Mitigation
Bio-4	Impacts to Special-Status Wetland Plant Species	PS	Bio-M4	Conduct Surveys, Adopt Avoidance Measures, and Instigate Compensatory Mitigation	Site-Specific	LTS
Bio-5	Disturbance of Rafting Waterfowl from Roosting and Foraging Habitat	PS	Bio-M5	Avoid Disturbance of Rafting Waterfowl from Roosting or Foraging Habitat	WT Program	LTS
Bio-6	Disturbance of Wading Bird, Shorebird, and Pelican Roosting and Foraging Habitat	PS	Bio-M6	Avoid Disturbance of California Brown Pelicans From Roosting and Foraging Habitat	Site-Specific	LTS
Bio-7	Disturbance of Bird Nesting Habitat	PS	Bio-M7	Avoid Disturbance of Bird Nesting Habitat	Both	LTS
Bio-8	Disturbance of California Clapper Rails and California Black Rails	PS	Bio-M8	Avoid Disturbance of California Clapper Rails and California Black Rails	Both	LTS
Bio-10	Potential Incidental Take of Sensitive Species	PS	Bio-M5 through Bio-M8	See above for Mitigation Names for these Mitigation Numbers	Varies, as above	LTS
Bio-11	Disturbance of California Clapper Rails and California Black Rails due to Construction Activities at Launch Sites	PS	Bio-M11	Avoid Disturbance of California Clapper Rails and California Black Rails due to Construction Activities at Launch Sites	Site-Specific	LTS
Bio-12	Regional Impacts on Special-Status Small Mammals of Bayland Marshes	PS	Bio-M12	Undertake Avoidance Measures	Both	LTS
Bio-13	Regional Impacts on Northwest Pond Turtles	PS	Bio-M12	Undertake Avoidance Measures (Bio-M12 also applies to this potential impact)	Both	LTS
Bio-14	Disturbance to Harbor Seals Due to Increased NMSB Presence Near Haul-Out Sites	PS	Bio-M14A	Review Improvements at Certain Sites and Implement Education and Outreach-- Educate NMSB Users in Vicinity of	Site-Specific	LTS

PRELIMINARY DRAFT

TABLE E-1. SUMMARY OF POTENTIAL IMPACTS AND ASSOCIATED MITIGATION

Impact Number	Impact Name	Significance Before Mitigation	Mitigation Number	Mitigation Name	When Applied¹	Significance After Mitigation
				Pupping Sites		
			Bio-M14B	Review Improvements at Certain Sites and Implement Education and Outreach-- Buffer Zone Signage and Other Markers	Site-Specific	
Bio-15	Avoidance or Abandonment of Traditional Harbor Seal Haul-out Sites, Due to Increased NMSB Use	PS	Bio-M15	Seasonal Closures, Monitoring and Adaptive Management	Both	LTS
Bio-16	Construction and Trailhead Impacts on Special-Status Animals of Bayland Marshes	PS	Bio-M16	Undertake Waste Management, Predator Control, and Basking Impact Minimization (also Bio-M2 and Bio-M3)	Site-Specific	LTS
Bio-17	Disturbance to Harbor Seals Due to Construction	PS	Bio-M17	Provide Mitigation for Disturbance to Harbor Seals Due to Construction/Improvements at WT Sites	Site-Specific	LTS
Cult-1	Disturbance to Prehistoric Archaeological Deposits During Use of the Water Trail	PS	Cult-M1	Include Protection of Cultural Resources in Education and Outreach Efforts	WT Program	LTS
Cult-2	Disturbance to Prehistoric Archaeological Deposits During Facility Improvements and/or Use of the Water Trail	PS	Cult-M2A	Undertake Expanded Archival Research and Field Investigations to Provide Information About Potential Prehistoric Archaeological Deposits	Site-Specific	LTS
			Cult-M2B	Protect Prehistoric Archaeological Remains in Adjacent Areas	Site-Specific	

PRELIMINARY DRAFT

TABLE E-1. SUMMARY OF POTENTIAL IMPACTS AND ASSOCIATED MITIGATION

Impact Number	Impact Name	Significance Before Mitigation	Mitigation Number	Mitigation Name	When Applied¹	Significance After Mitigation
Hyd-1	Local Degradation of Water Quality due to Construction Activities	PS	Hyd-M1	Employ Construction Best Management Practices	Site-Specific	LTS
Hyd-2:	Degradation of Water Quality due to Runoff from Trailheads	PS	Hyd-M2	Implement Stormwater Best Management Practices	Site-Specific	LTS
Hyd-5	Placement of Structures Within 100-Year Flood Zones that Could Impede or Redirect Flows	PS	Hyd-M5	Design All New Permanent Structures to Address Potential Flood Hazards	Site-Specific	LTS
TPC-1	Degradation in Levels of Service on Access Roadways	PS	TPC-M1	Undertake Traffic Assessment Prior to Designation of New or Enhanced WT Sites	Site-Specific	
TPC-2	Inadequate Parking at New or Improved WT Trailheads	PS	TPC-M2	Undertake Parking Study Prior to Development of New or Enhanced WT Sites	Site-Specific	LTS
TPC-3	Inadequate Emergency Vehicle Access	PS	TPC-M3	Evaluate Emergency Vehicle Access at New WT Sites and Sites with Substantial Improvements	Site-Specific	LTS
TPC-4	Hazards Due to Unsafe Access Roadways	PS	TPC-M4	Evaluate Plans for New WT Sites to Determine Safety for Vehicle Access	Site-Specific	LTS

Notes:

1 Mitigation measures that are applied at the site-specific level are addressed by this environmental effects checklist.

LTS = Less Than Significant

PS = Potentially Significant

**PRELIMINARY DRAFT
ENVIRONMENTAL EFFECTS CHECKLIST
San Francisco Bay Water Trail Program**

RECREATION

Recreation-1				
Is use of the proposed trailhead site currently at capacity and could increased use of existing facilities by WT users displace or exceed the capacity of existing recreational and associated support facilities?				
Yes	Implement Mitigation Measure Rec-M4B	No	N/A	(Reason)
Recreation-2				
Is the proposed trailhead site located within 4 miles of an area where hunting is currently permitted for all or a portion of the year?				
Yes	Implement Mitigation Measure Rec-M4C	No	N/A	(Reason)

NAVIGATION

Navigation -1				
Is the site located near commercial shipping or ferry routes?				
Yes	1. Implement site-specific signage as required by Mitigation Measure Nav-M1A 2. Implement Mitigation Measure Nav-M1C	No	N/A	(Reason)
Navigation -2				
Are wildlife buffers required at or near the site?				
Yes	1. Plan buffer zones to avoid navigation hazards as required by Mitigation Measure Nav-M1D	No	N/A	(Reason)

AESTHETICS

Aesthetics -1				
Does the trailhead plan include construction of new facilities?				
Yes	Implement Mitigation Measure Aesth-M1	No	N/A	(Reason)
Aesthetics -2				
Is the site located in a natural area?				
Yes	Implement Mitigation Measure Aesth-M1	No	N/A	(Reason)
Aesthetics -3				
Is this a new (planned) site?				
Yes	Implement Mitigation Measure Aesth-M1	No	N/A	(Reason)
Aesthetics -4				
Does the trailhead plan include construction of new parking areas?				
Yes	Implement Mitigation Measure Aesth-M1	No	N/A	(Reason)

PRELIMINARY DRAFT

BIOLOGICAL RESOURCES – VEGETATION

Biology (Vegetation) -1				
Is the site located near either sensitive or invasive plant species habitat?				
Yes	Implement Mitigation Measures Bio-M1 and Bio-M3	No	N/A	(Reason)
Biology (Vegetation) -2				
Are wetlands present in terrestrial and near-shore areas of the site? Does the trailhead plan include any new construction and/or requirements for anticipated repairs and maintenance that would require any filling of wetlands?				
Yes	Implement Mitigation Measures Bio-M2 and Bio-M3	No	N/A	(Reason)
Biology (Vegetation) -3				
For sites with new facilities other than signage: are sensitive plant species present at or in the vicinity of the site?				
Yes	Implement Mitigation Measures Bio-M1, Bio-M3, and Bio-M4	No	N/A	(Reason)

BIOLOGICAL RESOURCES – BIRDS

Biology (Birds) -1				
Is the site located near California brown pelican roosting areas?				
Yes	Implement Mitigation Measure Bio-M6	No	N/A	(Reason)
Biology (Birds) -2				
Is the site located in close proximity to known nesting sites and nesting habitat for colonial nesting birds, wading birds, shorebirds, or Western burrowing owls?				
Yes	Implement Mitigation Measure Bio-M7)	No	N/A	(Reason)
Biology (Birds) -3				
Is the site located in the vicinity of marsh habitat?				
Yes	Implement Mitigation Measure Bio-M8	No	N/A	(Reason)

BIOLOGICAL RESOURCES – OTHER SPECIES

Biology (Other Species) -1				
Is the site located in or near wetlands?				
Yes	Implement Mitigation Measure2 Bio-M2, Bio-M3, and Bio-M12	No	N/A	(Reason)
Biology (Other Species) -2				
Is the site located in the Suisun Marsh Area?				
Yes	Implement Mitigation Measure Bio-M13	No	N/A	(Reason)

PRELIMINARY DRAFT

Biology (Other Species) -3				
Is the site located within 4 miles of a recognized primary or secondary haul-out site (see Table 3.9.5-1)?				
Yes	Implement Mitigation Measure Bio-M14A and Bio-M14BB	No	N/A	(Reason)
Biology (Other Species) -4				
Is the site located within 4 miles of a known seal pupping site (see Table 3.9.5-2) or specifically identified in Impact Bio-15?				
Yes	Implement Mitigation Measure Bio-M14A and Bio-M15	No	N/A	(Reason)
Biology (Other Species) -5				
Do special status animal species potentially occur at or adjacent to proposed trailheads and does the Trailhead Plan involve facility development or other WT activities that may substantially increase site use?				
Yes	Implement Mitigation Measures Bio-M2, Bio-M3, and Bio-M16	No	N/A	(Reason)
Biology (Other Species) -6				
Is the site located within 500 meters of a primary or secondary haul-out site and is WT-related construction planned for the site?				
Yes	Implement Mitigation Measure Bio-M17	No	N/A	(Reason)

CULTURAL RESOURCES

Cultural Resources -1				
Does the trailhead plan include WT-related earthmoving or excavation?				
Yes	Implement Mitigation Measures Cult-M1, Cult-M2A, and Cult-M2B	No	N/A	(Reason)

HYDROLOGY AND WATER QUALITY

Hydrology -1				
Does the trailhead plan include WT-related construction?				
Yes	Implement Mitigation Measure Hyd-M1	No	N/A	(Reason)
Hydrology -2				
Does the trailhead plan include WT-related construction of new parking areas and any other paved areas?				
Yes	Implement Mitigation Measure Hyd-M2	No	N/A	(Reason)
Hydrology -3				
Does the trailhead plan include WT-related construction of new permanent facilities?				
Yes	Implement Mitigation Measure Hyd-M5	No	N/A	(Reason)

PRELIMINARY DRAFT

TRANSPORTATION, CIRCULATION, AND PARKING

Transportation -1				
Does the trailhead plan include WT-related facilities improvements that could attract increased usage?				
Yes	Implement Mitigation Measures TPC-M1, TPC-M3	No	N/A	(Reason)
Transportation -2				
Does the trailhead plan include WT-related construction of new or substantially expanded access facilities that could generate new parking needs?				
Yes	Implement Mitigation Measure TPC -M2	No	N/A	(Reason)
Transportation -3				
Does the site lack safe vehicle access, or could increased site use lead to unsafe conditions?				
Yes	Implement Mitigation Measure TPC-M4	No	N/A	(Reason)

APPENDIX F
LOCAL CLIMATE ACTION PLANS (CAPS)

APPENDIX F

LOCAL CLIMATE ACTION PLANS (CAPS)

CITIES

City of Alameda

A draft of the CAP was released in December 2008. The Plan lists five highly critical initiatives for reducing emissions throughout the City:

1. Adopt “Zero Waste Strategy” Programs and Ordinances
2. Develop a multi-faceted community outreach program to increase public awareness and participation in GHG reduction
3. Amend the Alameda Municipal Code to include sustainable design and green building standards for all new, substantially expanded, and remodeled buildings
4. Encourage the Alameda Public Utilities Board to require that Alameda Power & Telecom maintain and expand its source mix to 100% carbon-free energy
5. Develop and fund alternative transportation strategies in the City’s budget.

The overall goal in the CAP is to reduce community-wide emissions 25% below 2005 levels by 2020. All the initiatives in the CAP are placed in the following categories: transportation and land use; energy; waste and recycling; and community outreach and education.

City of Benicia

The Benicia CAP includes recommendations to cut GHG emissions from both municipal operations and community-wide emissions. The overall emission reduction goals are reaching 2005 levels by 2010 and 10% below 2000 levels by 2020.

The CAP includes emission reduction measures in the following categories:

- Education and Public Outreach
- Energy Production
- Transportation and Land Use
- Buildings
- Industry and Commercial
- Water and Wastewater
- Solid Waste
- Parks and Open Space

City of Berkeley

In 2006, voters in the City of Berkeley passed Measure G, which states that the City will set a goal of 80% reduction in GHG emissions by 2050, and also set a ten-year reduction target. The measure also states that an action plan will be developed to meet both the ten-year and the 2050 targets.

The CAP provides recommended emission reduction actions in the areas of:

- Sustainable Transportation and Land Use
- Building Energy Use
- Waste Reduction & Recycling
- Community Outreach and Empowerment
- Preparing for Climate Change Impacts

City of Oakland

The City of Oakland is currently developing an Energy and Climate Action Plan, but a draft is not yet available.

City of Richmond

The City of Richmond is currently developing a Climate Action Plan, but a draft is not yet available.

City of San Rafael

The City issued their Climate Change Action Plan in April 2009. The Plan targets a total reduction of 25% by 2020, and also achieving the statewide goal of 80% reductions by 2050.

The Plan is organized by how its recommendations affect the various facets of the community in the following categories:

- Lifestyles (non-auto mobility, transit-oriented development, waste reduction, and energy-efficient vehicles)
- Buildings (resource and energy conservation, renewable energy, water conservation)
- Environment (urban forestry and local food production, habitat protection and restoration, adaptation to climate change)
- Economy (green businesses, social equity)

City of San Mateo

This CAP for Operations and Facilities is dated January 29, 2008. Because measures in this CAP are specific to city-owned facilities and city employees, they are not relevant to potential Bay Area Water Trail sites.

COUNTIES

Alameda County

Between August 2009 and March 2010, County staff and consultants will draft a community Climate Action Plan (CAP) for the unincorporated areas of Alameda County. These communities include Ashland, Castro Valley, Cherryland, El Portal Ridge, Fairview, Hayward Acres, Hillcrest Knolls, Mt. Eden, San Lorenzo, Sunol, and Rural East County. The Plan is currently in a final draft stage and available for public review.

City and County of San Francisco

The City and County of San Francisco issued a Climate Action Plan in 2004. The GHG reduction goal in the plan is:

- 20% below 1990 levels by 2012.

Recent reports show that San Francisco has reduced levels by about 7% and has 13% to go by 2012. Relevant goals include reducing transportation emissions by increasing the use of public transit; increasing the use of ridesharing; increasing bicycling and walking; and discouraging driving. The San Francisco CAP will likely be updated in 2010.

Contra Costa County

Contra Costa County developed a Municipal Climate Action Plan in December 2008. This document only relates to curbing GHG emissions from county-owned facilities and vehicles, and also includes emissions and emission reduction goals from employee commuting. Because the measures included in this CAP are specific to county-owned facilities and county employees, they are not relevant to potential Bay Area Water Trail sites.

Marin County

Marin County issued an updated GHG Reduction Plan in October 2006. This plan includes the following target:

- Reduce GHG emission 15-20% below 1990 levels by the year 2020 for internal government operations (buildings and vehicles) and 15% countywide.

Emission reduction measures are provided in the following categories: building energy use, transportation, waste management, and land use. Some measures potentially relevant to future Bay Area Water Trail sites include:

- Establish/expand recycling programs in the community
- Expand community bicycle infrastructure
- Offer prioritized parking for hybrid cars
- Encourage community car-sharing
- Install green or reflective roofing
- Install solar panels on municipal facilities

Napa County

Napa County issued a Draft Community-Wide Reduction Plan in June 2009. The plan includes the following emission reduction goal:

- Countywide: 30% below forecasted emissions by 2020.

The plan includes goals for unincorporated Napa County and all the incorporated cities in the County (Yountville, Calistoga, St. Helena, American Canyon, and the City of Napa.)

Objectives and Actions are provided for the following categories: Transportation and Mobility; Buildings and Energy; Consumption and Solid Waste; Agriculture, Natural Resources, and Urban Forests; Community Engagement; and Local Government Operations. Some key actions are:

- Expand Park and Ride areas and support facilities to encourage public transportation use, and car and van pooling
- Adopt policies and ordinances that encourage car-free tourism
- Reduce GHG emissions from buildings and energy use
- Enact ordinances and create incentives to achieve construction and demolition debris waste diversion of 75% to 90% by 2020.
- Partner with community-based non-profit organizations and others to undertake public outreach and education efforts that broaden community involvement in reducing GHG emissions.

San Mateo County

The Planning and Building Department will update the conservation element of the San Mateo County General Plan to include a new chapter (element) on conservation and energy efficiency. This chapter will include policies related to the interaction between land use, transportation, and energy. A Climate Action Plan will be investigated for its inclusion in the element.

Santa Clara County

Santa Clara County issued a Draft Climate Action Plan for Operations and Facilities in September 2009. This Plan is applicable to County-owned facilities and fleets, and includes emissions from the County employees' commutes, but does not include emissions from the community. Because the measures included in this CAP are specific to county-owned facilities and county employees, they are not relevant to potential Bay Area Water Trail sites.

Solano County

During the 2008 General Plan Update process Solano County committed to the development and adoption of the CAP by June 30, 2010 and to reduce GHG emissions to 20% below 1990 levels by 2020. The CAP will address both community-wide GHG emissions and emissions specifically from County operations. Focus Group meetings were held in February and March, 2010, to solicit input for the CAP.

Sonoma County

Sonoma County issued a Community Climate Action Plan in 2008. The following emission reduction goal is included:

- In 2005, all nine cities and the County passed resolutions adopting the boldest community-wide target in the nation — 25 percent below 1990 levels by 2015

The Plan addresses emission reductions for all nine incorporated cities and the unincorporated portions of the County. Solutions to reduce emissions are provided in the categories of electricity and natural gas; transportation and land use; agriculture and forests; and solid waste.

Solutions include:

- Maximize energy efficiency and water efficiency
- Institute a county-wide mandatory green building ordinance and remove barriers to green building
- Strengthen all Environmental Impact Reports on proposed projects to promote GHG emission reductions
- Reduce the amount of waste generated

APPENDIX G
METHODOLOGY FOR ESTIMATING GREENHOUSE GAS
(GHG) EMISSIONS FROM THE
SAN FRANCISCO BAY AREA WATER TRAIL

APPENDIX G

METHODOLOGY FOR ESTIMATING GREENHOUSE GAS (GHG) EMISSIONS FROM THE BAY AREA WATER TRAIL

This appendix presents the methodology employed and step-by-step calculations completed to estimate potential increases and reductions in GHG emissions associated with implementation of the WT. Calculations were performed for construction emissions, operational emissions, and emission reductions; construction emission calculations are presented first..

Construction Emissions

Construction emissions were completed using the following two steps.

1. Categorized new facility construction for Water Trail sites by project type.¹ There are four site categories, and each site category has a project type or types. The four site categories and four project types are listed in Table 1 below.

Table 1: Water Trail Site Categories and Improvements Needed

Site Category	Number of Sites	Construction Project Type(s)
1*	57	Water Trail Signage
2*	9	Water Trail Signage
3	37	Small building, such as a restroom or boat storage shed, or addition of a new float
4	9	Major work such as a new dock, or development of a new site

* Note: Categories 1 (HOS in the WT Plan) and 2 (very similar to HOSs) were not included in the calculations for GHG emissions because the emissions related to creating and placing signage at those sites or implementing other very minor improvements are expected to be minimal.

¹ Amounts spent by other agencies and organizations to construct Water Trail sites are not included in this estimate. The reasoning is that many sites have already been developed by other agencies and organizations without the Water Trail project, and many sites will likely be funded in the future, with or without the Water Trail. Agencies that are likely to fund sites with or without the Water Trail project include Cal Boating, the East Bay Regional Park District, and Santa Clara County Department of Parks and Recreation. In addition, SCC may only fund regionally significant projects, and some sites that may become part of the Water Trail will only be regionally significant because they are part of the Water Trail. Thus, in these cases, the funding from SCC for construction or improvements to these sites will be directly attributable to implementation of the Water Trail.

2. Used the construction-specific emission factors shown below and estimated funding amounts from Step 1 for a 10-year period to estimate emissions that will occur in the 10-year period. Estimated funding amounts are based on the *2007 Coastal Conservancy Strategic Plan*. However, some of the assumptions in the 2007 Plan have changed, so the funding amounts presented in that Plan for the Water Trail were adjusted by SCC staff . For example, in the period between 2007 and 2010, the State of California experienced a fiscal crisis, causing funding to state agencies to decrease, and causing all state employees to take unpaid furloughs 3 days per month. It was estimated in the 2007 Strategic Plan that the SCC would contribute \$3.1 million to fund 35 Water Trail construction projects over a 5-year period. Currently, there are an estimated 46 sites that need improvements or development. In these calculations, the assumption is that SCC will contribute \$3.1 million to fund 46 Water Trail Sites over the next 10 years. The reasoning is that funding for state agencies has decreased, so the estimate of \$3.1 million over 5 years, as presented in the 2007 Plan, is no longer realistic.

Table 2: Emission Factors and Estimated Emissions

Site Category	Anticipated Funding (over a 10-year period) - Total	Anticipated Funding (over a 10-year period) – in \$1000s	Emission Factor*	Estimated Emissions over a 10-year period (metric tons CO ₂ e)	Estimated Annual Emissions (metric tons CO ₂ e)
3	\$2,480,000	\$2,480	0.13 metric tons CO ₂ e per \$1,000	322.4	32.24
4	\$620,000	\$620	0.23 metric tons CO ₂ e per \$1,000	142.6	14.26
TOTAL:				465.0	46.50

* Emission factors are taken from: EPA, *Potential for Reducing GHG Emissions in the Construction Sector*, February 2009, Appendix B: Details of 2002 Construction Subsector Emissions Intensity, Commercial & Institutional Building Construction (page 34). The emission factor for Site Category 3 is for the “Framing Contractors: Carpentry” subsector, since most of the projects in this category will include light construction, such as a restroom building or boat storage structure. The emission factor for Site Category 4 is for the “Commercial and Institutional Building Construction” subsector; these sites may need more development, such as construction of a parking lot and a new boat ramp.

Operational Emissions

As described in Section 3.15, the primary potential source of operational emissions is vehicle travel to and from the WT trailheads; Scope 2 emissions from use of electricity at WT trailheads

are expected to be extremely low. The estimate of operational emissions therefore focused on travel-related emissions. The following eight-step process was used to estimate travel-related emissions.

1. Estimated the total amount that will be spent on marketing that will increase trips to the Water Trail. Such funding will be used to create a website, brochures, and a guidebook. The total estimated amount is \$150,000 over 20 years. Assumptions on marketing funding are provided in Table 3 below.

Table 3: Estimated Water Trail Marketing Funding Over a 20 Year Time Period

Type of Marketing Product	Estimated Funding for Development	Estimated Funding for Maintenance	Total Estimated Funding
Website	\$10,000	\$40,000 (\$2,000 per year for 20 years)	\$50,000
Brochure	\$8,000 (development and printing)	\$7,000 (updates and additional printing)	\$15,000
Guidebook	\$40,000 (development and printing)	\$15,000 (updates and additional printing)	\$55,000
Other Resources	To be determined		\$30,000
TOTAL:			\$150,000

2. Used the assumption that every \$1 spent on marketing will generate one new non-motorized boat trip to the San Francisco Bay to develop a high (conservative) estimate of new emissions attributable to the Water Trail. This assumption is based on literature from statewide recreation marketing programs that indicate that about one new trip is generated for every \$1 spent on marketing.² However, it is *not* likely that every \$1 spent on marketing the Water Trail will generate one new trip. The reason is because many non-motorized boat participants may not be persuaded or able to recreate on San Francisco Bay due to the conditions on the Bay. In comparison to most other waterways in the region and outside of the region, the San Francisco Bay is colder, has higher winds and choppier waves, and it is not advisable to use some non-motorized watercraft (such as inflatable rafts) on San Francisco Bay. Based on the Cal Boating (2009) survey results, less than 50% of non-motorized small boat owners in the San Francisco Bay Area Region listed San Francisco Bay as their most frequently used water body. The remainder choose to participate on other waterways outside the geographic extent of the WT. These percentages are not likely to change greatly due to the establishment of the Water Trail and new Water Trail facilities.

² See the following sources: Siegel, Bill. *The Rise and Fall of Colorado Tourism*. Longwoods International, p. 10. Travel Oregon. *Travel Oregon Strategic Marketing Plan and Budget 2007-2009*, p. 12.

However, using the assumption that \$1 will generate one new trip provides a published methodology for estimating the highest level of new trips generated, which is the first step of estimating the highest level emissions expected to be generated from implementation of the Water Trail.

Calculation	Units
Total Amount Spent on Marketing * 1	High Estimate of New Trips Generated
\$150,000 * 1	150,000 new trips

3. Assumed that all trips include travel in a vehicle to and from the launch site. This may also lead to a high (conservative) estimate of emissions because a percentage of these new trips may occur using alternate forms of transportation (public transportation, bicycles, etc.).
4. Estimated the average round-trip distance of a new trip. The estimate used an average of the one-way trip distances reported by Bay Area non-motorized boat owners for their most recent trip to a local destination in the unpublished raw data (personal communication, Wendy Pratt, NewPoint Group, March 2010, n=52) from the published *Non-Motorized Boating in California* (Cal Boating, March 2009) report for the survey respondents in the Bay Area. (Note: Trips made by residents of the Bay Area in order to boat on San Francisco Bay are interpreted to be those for which travel time one-way was no more than 1.5 hours. It is not explicitly known whether trips of that length kept the boater within the extent of the Water Trail. It is also assumed that vehicle trips that were longer than 1.5 hours one-way took the Bay Area resident beyond the extent of the WT.)

Calculation	Units
Average One-Way Local Trip Distance from Survey Results * 2	Average Local Round-Trip Distance (Miles)
18.8 miles * 2	37.6 miles

5. Estimated the total vehicle miles traveled using the above assumptions.

Calculation	Units
High Estimate of New Trips Generated * Average Local Round-Trip Distance	Total Vehicle Miles Traveled
150,000 trips * 37.6 miles	5,640,000 vehicle miles traveled (VMT)

6. Estimated the total gallons of fuel consumed. The calculations assumed an average gas mileage of 20.25 mile per gallons, and assumed that all vehicle trips use gasoline. The source for average gas mileage was the US Bureau of Transportation Statistics, and the average gas mileage was based an average of the fuel efficiency for passenger cars and for other 2-axle 4-tire vehicles. Data are from 2007, the most recent year available.³

Calculation	Units
Total Vehicle Miles Traveled/Miles per Gallon (20.25)	Total Gallons of Gasoline Consumed
5,640,000 vehicle miles traveled / 20.25	278,519 gallons of gasoline consumed

7. Used total mileage, total fuel consumption, and appropriate emission factors and Global Warming Potentials (GWPs)⁴ to estimate GHG emissions utilizing the protocols in the *California Climate Action Registry General Reporting Protocol, version 3.1* (January 2009).

Type of GHG Emission	Calculation	Units
CO ₂ Emissions	Gallons * kg CO ₂ /gallon * conversion factor	metric tons CO ₂ e
	278,519 gallons * 8.81kg CO ₂ /gallon * 0.001	2,454 metric tons CO ₂ e

³ See the following website for data:
http://www.bts.gov/publications/national_transportation_statistics/html/table_04_23.html

⁴ GWP is an abbreviation for global warming potential, which is used to convert non-CO₂ GHGs into CO₂e.

Type of GHG Emission	Calculation	Units
CH ₄ Emissions	Miles * g CH ₄ /mile * conversion factor * GWP	metric tons CO ₂ e
	5,640,000 vehicle miles traveled * 0.0101 g CH ₄ /mile * 0.000001 * 21	1.2 metric ton CO ₂ e
N ₂ O Emissions	Miles * g N ₂ O/mile * conversion factor * GWP	metric tons CO ₂ e
	5,640,000 vehicle miles traveled * 0.0157 g N ₂ O/mile * 0.000001 * 310	27.4 metric tons CO ₂ e
TOTAL:		2,483 metric Tons CO ₂ e

8. Divided total emissions by 20 years to find the estimated *annual* GHG emissions.

Calculation	Units
Total Emissions/20 Years	Annual Emissions, in metric tons CO ₂ e / year
2,483 metric tons CO ₂ e / 20 years	124 metric tons CO ₂ e/year

Emissions Reductions

A small number of new trips to Water Trail sites are likely to replace current trips that are taken by NMSB owners in the Bay Area region to destinations outside of the region. In other words, a small percentage of NMSB owners who currently tend to travel outside of the region to participate in non-motorized boating may be persuaded to participate on the San Francisco Bay due to implementation of the Water Trail project. These non-motorized boat owners will be replacing a longer trip to a destination outside of the region with a shorter trip to a destination on San Francisco Bay. The replacement of the longer trips with shorter trips will cause GHG emissions reductions. The following seven-step methodology was used to estimate these emission reductions.

1. Estimated the percentage of new trips to the Water Trail (estimated in Step #2 for operational emissions, above) that will be replacing longer trips to destinations outside of the region. Assumed 5% of new trips will replace longer trips. The percentage of shorter replacement trips is kept low because many NMSB owners may not wish to participate in non-motorized boating activities in San Francisco Bay due to the type of non-motorized boat they use and to the conditions often found on the San Francisco Bay, including colder waters, higher winds, and choppy waters. Also, data for the published survey for

Non-Motorized Boating in California (Cal Boating, March 2009) for the survey respondents in the Bay Area (data provided by Wendy Pratt, March 2010, n=52) indicate that about 4% of all non-motorized boat owners in the Bay Area tend to travel out of the region to participate in a waterway similar to the San Francisco Bay (such as Tomales Bay), using a boat that could be used on the San Francisco Bay.

Calculation	Units
High Estimate of New Trips Generated * 0.05	New Trips to the San Francisco Bay that are Replacing Trips to Non-Local Destinations
150,000 trips * 0.05	7,500 trips

- Estimated the round-trip distance to a destination outside of the region. Used an average of the one-way trip distances reported by Bay Area non-motorized boat owners for their most recent trip to a non-local destination in the raw unpublished data for the published survey for *Non-Motorized Boating in California* (Cal Boating, March 2009) for the survey respondents in the Bay Area (data provided by Wendy Pratt, March 2010, n=52). This methodology assumes that one-way trip durations of 1.5 hours or more are trips to non-local destinations.

Calculation	Units
Average One-Way Non-Local Trip Distance from Survey Results * 2	Average Non-Local Round-Trip Distance (Miles)
177.3 miles * 2	354.6 miles

- Subtracted the average round-trip distance to the San Francisco Bay from the average round-trip distance to a non-local site to find the mileage reduced in an average trip.

Calculation	Units
Average Non-Local Round-Trip Distance — Average Local Round-Trip Distance	Difference in Distance between a Non-Local and Local Trip, in Miles per Trip
354.6 miles — 37.6 miles	317 miles

4. Multiplied the number of new trips from Step #1 above (the New Trips to the San Francisco Bay that are Replacing Trips to Non-Local Destinations) by the difference in distance between a non-local and local trip to find the total mileage reduced.

Calculation	Units
Total New Trips to the San Francisco Bay that are Replacing Trips to Non-Local Destinations * Difference in Distance between a Non-Local and Local Trip (miles per trip)	Total Vehicle Miles Traveled Reduced
7,500 trips * 317 miles	2,377,500 vehicle miles traveled reduced

5. Estimated the total gallons of fuel consumed. Followed the same assumptions and protocols used for the operational emission estimate, above, to estimate the gallons of fuel reduced, and reduced emissions. Assumed an average gas mileage of 20.25 mile per gallons (based on US Bureau of Transportation Statistics 2007 data for average fuel efficiency for passenger cars and for other 2-axle 4-tire vehicles),⁵

Calculation	Units
Total Vehicle Miles Traveled/Miles per Gallon (20.25)	Total Gallons of Gasoline Reduced

⁵ See the following website for data:
http://www.bts.gov/publications/national_transportation_statistics/html/table_04_23.html

Calculation	Units
2,377,500 vehicle miles traveled / 20.25	117,407 gallons of gasoline reduced

6. Used total mileage, total fuel consumption, and appropriate emission factors and Global Warming Potentials (GWPs)⁶ to estimate GHG emissions utilizing the protocols in the *California Climate Action Registry General Reporting Protocol, version 3.1* (January 2009).

Type of GHG Emission	Calculation	Units
CO ₂ Emissions	Gallons * kg CO ₂ /gallon * conversion factor	metric tons CO ₂ e
	117,407 gallons * 8.81kg CO ₂ /gallon * 0.001	1,034 metric tons CO ₂ e
CH ₄ Emissions	Miles * g CH ₄ /mile * conversion factor * GWP	metric tons CO ₂ e
	2,377,500 vehicle miles traveled * 0.0101 g CH ₄ /mile * 0.000001 * 21	0.5 metric ton CO ₂ e
N ₂ O Emissions	Miles * g N ₂ O/mile * conversion factor * GWP	metric tons CO ₂ e
	2,377,500 vehicle miles traveled * 0.0157 g N ₂ O/mile * 0.000001 * 310	11.6 metric tons CO ₂ e
TOTAL:		1,046 metric Tons CO ₂ e

7. Divided total emission reductions by 20 years to find the estimated *annual* emission reductions.

Calculation	Units
Total emission reductions / 20 years	Annual emission reductions, in metric tons CO ₂ e/year
1,046 metric tons CO ₂ e / 20 years	52 metric Tons CO ₂ e

⁶ GWP is an abbreviation for global warming potential, which is used to convert non-CO₂ GHGs into CO₂e.

APPENDIX H
SUPPLEMENTAL STRATEGIES FOR THE
ENHANCED WATER TRAIL PLAN ALTERNATIVE

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SUPPLEMENTAL STRATEGIES FOR ENHANCED WATER TRAIL PLAN ALTERNATIVE

STRATEGY	PURPOSE AND APPLICATION
<p>25. Comprehensive Education Program Create an overall educational framework to support the various educational elements of the WT Program (signage, media, boater-to-boater education, stewardship, etc.).</p>	<p>A comprehensive educational framework, including a well-designed curriculum, will ensure that education activities are focused on the most important issues, that all necessary topics are addressed, and that key content, such as appropriate buffer distances for sensitive species, is clearly and consistently communicated across a wide range of educational media and activities. The key content will focus on safe and environmentally-responsible boating (the “Water Trail ethic”). It will allow the WT to build on existing information, education, outreach, and coordination efforts, and include identification of available resources, and development of a centralized resource for up-to-date information on various WT-related topics.</p> <p>There is overlap between Strategies 25 and 26, in that improved education would enhance boater safety.</p>
<p>26. Navigational Safety Develop and implement comprehensive safety education guidelines, including minimum content standards for safety education, provide safety-oriented signage, and encourage improved dissemination of information on safety-related incidents.</p>	<p>Education is a key component of the WT Plan. This strategy emphasizes the importance of providing consistent, effective navigational safety information. Safety education for non-motorized small boat users is currently provided on an <i>ad hoc</i> basis by various organizations. The proposed guidelines and the minimum content would ensure that safety training provided by various organizations would meet a minimum standard. The WT would serve as a centralized forum for safety-related information so updated safety information can be provided more easily to the potentially large number of individuals who provide safety education. The goal of the safety education program would be to develop a “safety ethic” among WT users and encourage boaters to report safety-related incidents. Safety-related signage may be used to remind boaters both about basic safety principles (e.g., use of PFDs), and to identify potential safety risks in the vicinity of an access site. Improved reporting and on-going sharing of information about incidents is an effective means of identifying safety concerns (such as facility design issues and vessel use conflicts) and helping boaters understand the potential implications of their actions.</p>
<p>27. Boat Washing Facilities Provide boat washing facilities where feasible.</p>	<p>Patterns of non-native plant invasions suggest that boats may act as a vector for spreading invasive plants. WT educational materials will encourage boat and gear washing to reduce the potential spread of invasive plants by NMSBs. Providing facilities for boat washing is a simple way to facilitate compliance with the boat and gear washing recommendation.</p>

STRATEGY	PURPOSE AND APPLICATION
<p>28. GHG Best Management Practices for Construction, Trailhead Operation, and WT Program</p> <p>Implement best management practices to minimize GHG emissions associated with construction of new trailhead facilities, operation of existing facilities, and implementation of the WT program.</p>	<p>Potential increases in GHG emissions from implementation of the Water Trail would comprise a very small fraction of the overall GHG emissions for the Bay Area, and implementation of the WT would not conflict with the goals of AB 32. Education and outreach materials should encourage awareness of climate changes and actions that individual boaters can take to reduce their carbon footprint (e.g., carpooling to the trailhead, boating closer to their homes, using non-motorized boats instead of motorized boats, etc.) In addition, best management practices for construction and trailhead operation should be incorporated into any project. Construction-related measures may include:</p> <ul style="list-style-type: none"> • Use alternatively-fueled vehicles, such as construction equipment that uses biodiesel fuel or other low-GHG emitting fuels, when possible. • Create and enforce limits on idling for construction and delivery vehicles. • Implement green building strategies for constructing WT facilities. Such strategies include: design of buildings, restrooms, and boat storage sheds to use minimal amounts of energy or to have no net energy use, the use of sustainably-harvested wood for lumber, and other sustainable, reused, and/or recycled building materials. • If appropriate, install renewable energy power systems at Water Trail facilities. <p>In addition, WT staff and the PMT will encourage site owners/managers to include these construction measures as standard elements of construction contracts pertaining to any construction undertaken pursuant to the WT.</p> <p>Certain planning, design, and management approaches may also help to reduce GHG emissions during operation of trailheads. The following measures should be incorporated as appropriate:</p> <ul style="list-style-type: none"> • Include secure and convenient bicycle parking (such as bicycle lockers or bicycle racks) at WT sites whenever possible, especially those sites with boat storage facilities, to encourage boating participants to bicycle to WT sites. • Whenever possible, develop new WT sites at locations accessible by public transportation and within 0.25 miles of a public transportation stop. For the sites accessible by public transportation, provide boat storage, if possible, to encourage boaters to use public transportation and reduce vehicle trips.

STRATEGY	PURPOSE AND APPLICATION
	<ul style="list-style-type: none">• Work with site owners/managers to encourage incentives for use of alternatively-fueled vehicles, such as charging stations for plug-in electric vehicles, providing preferred parking locations, and extending allowable parking durations.• Work with site owners/managers to encourage incentives for carpooling, such as providing preferred parking locations, and extending allowable parking durations.• Include information in the WT literature (brochure, guidebook, and map) about carpooling, using public transportation, bicycling, and walking to WT sites as a means to reduce GHG emissions and to reduce other air emissions

