

COASTAL CONSERVANCY

Staff Recommendation  
February 14, 2012

**HUMBOLDT BAY NATIONAL WILDLIFE REFUGE RESTORATION PLANNING  
AND PERMITTING**

Project No. 13-001-01  
Project Manager: Joel Gerwein

**RECOMMENDED ACTION:** Authorization to disburse up to \$30,000 to the U.S. Fish and Wildlife Service to prepare designs and environmental permitting documents for the restoration of coastal wetlands at White Slough and Hookton Slough on Humboldt Bay, in Humboldt County.

**LOCATION:** Unincorporated Humboldt County

**PROGRAM CATEGORY:** Resource Enhancement

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**EXHIBITS**

- Exhibit 1: [Project Location](#)
- Exhibit 2: [Site Photographs](#)
- Exhibit 3: [Conceptual Restoration Plans](#)
- Exhibit 4: [Project Letters](#)

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**RESOLUTION AND FINDINGS:**

Staff recommends that the State Coastal Conservancy adopt the following resolution pursuant to Sections 31251-31270 of the Public Resources Code:

“The State Coastal Conservancy hereby authorizes the disbursement of an amount not to exceed thirty thousand dollars (\$30,000) to the U.S. Fish and Wildlife Service (USFWS) to prepare designs and environmental permitting documents for the restoration of coastal wetlands at White Slough and Hookton Slough on Humboldt Bay. Prior to disbursement of any funds, the FWS shall submit for the review and approval of the Executive Officer of the Conservancy a work plan, schedule, budget, and the names of any contractors to be employed.”

Staff further recommends that the Conservancy adopt the following findings:

“Based on the accompanying staff report and attached exhibits, the State Coastal Conservancy hereby finds that:

1. The proposed authorization is consistent with Chapter 5.5 of Division 21 of the Public Resources Code, regarding integrated coastal and marine resource protection projects.
2. The proposed project is consistent with the Conservancy's Project Selection Criteria and Guidelines adopted on November 10, 2011.
3. The project area is identified by the Humboldt County Local Coastal Program as requiring public action to resolve existing resource protection problems."

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**PROJECT SUMMARY:**

This project involves the preparation of designs and environmental permitting documents for the restoration of coastal wetlands in the White Slough and Hookton Slough Units of the Humboldt Bay National Wildlife Refuge (HBNWR) (Exhibits 1 and 2). These two sites offer the opportunity to restore approximately 100 acres of salt marsh, and provide valuable habitat for fish and wildlife, including species listed as endangered or threatened under the state and federal Endangered Species Acts, such as coho and Chinook salmon. The USFWS has prepared conceptual restoration plans for these sites (Exhibit 3) and USFWS staff will utilize these plans to develop restoration designs sufficient for environmental permitting purposes. The Conservancy's funds will be utilized to prepare the following permitting documents:

- Environmental Assessment (EA) for National Environmental Policy Act compliance, tiering off HBNWR's EA for its 2009 Comprehensive Conservation Plan and supporting documentation for California Environmental Quality Act compliance
- Section 404 U.S. Army Corps of Engineers permit (Individual Permit or Nationwide Permit 27 for Aquatic Habitat Restoration)
- Consistency Determination under the California Coastal Act (Federal Division of the California Coastal Commission)
- Water Quality Certification from the North Coast Water Quality Control Board
- Development Permit from the Humboldt Bay Harbor, Recreation and Conservation District

In order to be eligible for potential implementation funding from the federal North American Waterfowl Conservation Act program, the environmental assessment and permitting work must be completed by June, 2013.

*Salt Marsh Restoration at White Slough and Hookton Slough Units*

Salt marsh was historically the most widespread wetland type around Humboldt Bay, but only ~10 percent remains (~900 acres of current salt marsh remaining from ~9,000 historic acres), largely due to diking from the late nineteenth to the early twentieth century. The majority of land within the HBNWR boundary was historically tidally influenced, comprising large areas of salt marsh. Most of the lands were diked to prevent tidal water exchange and to promote agricultural practices. Many changes in the topography, hydrology, soils, and plant species composition have taken place since these lands were diked.

Native salt marsh is a threatened habitat type in Humboldt Bay and throughout the United States. Salt marsh contributes invaluable nutrients to the estuarine ecosystem; provides important habitat

for fish, invertebrates, many shorebirds, and other waterbirds; filters out pollutants; and buffers adjacent lands from flood tides and storms. Protection from flooding and storms is becoming more important due to sea level rise. Salt marshes provide habitat for the endangered tidewater goby, several species of threatened salmonids, and possibly for the threatened eulachon. Because of extensive diking, the Humboldt Bay estuary has sustained significant losses of salt marsh, primary productivity, and natural hydrology resulting in changes to sedimentation, deposition, currents, habitat for estuarine plant and animal species, and water quality. The White Slough and Hookton Slough units of the refuge provide some of the few remaining opportunities to regain lost salt marsh around Humboldt Bay.

#### White Slough Unit

Salt marsh restoration at the White Slough Unit (WSU) would occur in an area that consists of diked tidelands. WSU includes approximately 65 acres of diked wetlands, consisting primarily of brackish marsh (60 acres), as well as small areas of agricultural wetlands, freshwater marsh, and riparian habitat. Brackish marsh at the WSU is very low in species diversity, consisting of the native salt grass (*Distichlis spicata*), invasive sickle grass (*Parapholis strigosa*) and occasional non-native creeping saltbush (*Atriplex triangularis*). As part of a functioning salt marsh, where it occurs as a more diverse association, this brackish marsh vegetation would be of much higher value. Behind the dikes it forms a near monoculture of low wildlife value and biodiversity. The dike separating this area from tidal influence is eroded and is overtopped at king tides (Exhibit 2). Water is currently seeping through the dike in at least one location. The USFWS installs sandbags on part of the dike during the winter to reduce seepage. The diked wetlands have subsided such that their current elevation is approximately three feet lower than that of the salt marsh on the Bay side of the dikes. When the dikes fail, which is likely to occur in the next several years unless they are repaired, the brackish marsh areas will be converted to mudflats, and the Tompkins Hill Road-Highway 101 Interchange, which provides access to the College of the Redwoods, will be increasingly threatened with flooding. The threat of dike failure is exacerbated by ongoing sea level rise.

The conceptual restoration plan for the WSU (Exhibit 3) calls for the placement of fill to raise the elevation of currently diked wetlands by more than three feet, allowing for the establishment of the high-elevation mixed marsh type. Tidal channels would be created within the imported fill. The four tidegates in the northern area would be removed to allow tidal inundation of the area. The dike in the southern area would be strategically breached to introduce tide water. The tidegate would be removed from Chism Creek, which is currently channelized and discharges directly into Humboldt Bay, and the creek would be re-directed into the southern area to maximize the freshwater/salt marsh continuum (Exhibit 3). Clean sediment for the project could become available in the next two to four years from the Martin Slough Restoration Project (a project that has been supported by the Conservancy through previous grants) and from the dredging of the Woodley Island and Eureka Marinas (Exhibit 1). Utilizing these dredged materials to restore salt marsh at the WSU will be a beneficial reuse of what might otherwise be disposed of on existing uplands at significant cost, thereby lowering the cost to implement the Martin Slough Enhancement Project. The restoration would provide benefits for fish and wildlife habitat, flood protection, and sea level rise adaptation, as well as allowing for increased carbon sequestration in restored salt marshes. Proceeding with design and permitting as soon as possible is imperative in order to take advantage of multiple opportunities for federal grant funding for project implementation.

### Hookton Slough Unit

Salt marsh restoration at the Hookton Slough Unit (HSU) would also occur in an area that consists of diked tidelands. The HSU was historically tidally influenced with freshwater contributions coming from Salmon Creek during floods, runoff and perennial springs from Table Bluff. The area is currently a mixture of fresh and brackish marsh and introduced grasses (Exhibit 3). Current wildlife use is primarily by small birds, mammals, and invertebrates; however, the freshwater cattail swamp in the southeastern portion of the HSU is a relatively rare wetland type around Humboldt Bay and is used extensively by bitterns, rails, marsh wrens and red-winged blackbirds. Much of the unit (especially the west side) is currently not conducive to use by waterfowl or shorebirds due to vegetation and/or water conditions.

The conceptual restoration plan for the HSU involves modifying tidegates and breaching dikes to allow muted tidal influence, enhanced fish passage, salmonid rearing, and salt marsh restoration through the placement of fill to raise the elevation of diked tidelands that would otherwise convert to mudflat if dikes are breached or overtopped (Exhibit 3). Salt marsh restoration in the central and western parts of the unit, in areas that are currently brackish marsh, would be possible through the modification of tidegates without placement of fill. Construction of a 0.25 mile low contour dike would allow the western and eastern portions of the HSU to remain brackish and freshwater marsh, and would protect Hookton Road, a county road that provides access to homes and a public recreation area on the Refuge. In addition, large woody debris would be installed in upper Hookton Slough to enhance habitat for salmonids, tidewater gobies, and other species.

The end result would be a diverse association of wetland types, providing a rich habitat mosaic with high value for fish and wildlife. Because of the proximity of the HSU to Salmon Creek, the potential value of these marshes as off channel rearing habitat for salmonids is very high. The HSU also has high potential as tidewater goby habitat and is designated as critical habitat in the recovery plan for this species. Hookton Road is threatened with flooding by sea level rise, and would be protected by marsh restoration involving the placement of fill material to increase the elevation of subsided tidelands. While it is more likely that dredge spoils from the Martin Slough project will be used at White Slough, it is possible that some of the dredge material would be used at Hookton Slough.

USFWS staff at the HBNWR is highly qualified to carry out this project. The HBNWR recently restored 2,600 linear feet of riparian habitat and 50 acres of salt marsh at the Salmon Creek Unit. The Salmon Creek project included the placement of fill to restore salt marsh on subsided diked tidelands.

### **Site Description:**

As California's second largest natural bay and the largest estuary on the Pacific coast between San Francisco Bay and Coos Bay, Oregon, Humboldt Bay (Exhibit 1) is a complex ecosystem and valuable resource for California and the nation because of its natural and environmental resources, its aesthetic appeal and recreational opportunities, its ecological services, economic benefits, and its vital transportation links. Visitors and Humboldt County residents alike value Humboldt Bay for its natural and man-made attributes. The biota associated with Humboldt Bay is diverse and ecologically significant at scales ranging from a local focus on fisheries and algal uses by local residents to a participation in hemispheric ecological patterns such as shorebird and

waterfowl migration. The Bay hosts over 100 plant species, 300 invertebrate species, 100 fish species, and 200 bird species, including those that rely on the bay as they travel the Pacific Flyway. Recent studies indicate the importance of the Bay in the life cycles of commercially and recreationally important fish species, and the general level of biological vitality in the Bay has been identified as an important aesthetic and quality-of-life variable for both residents and visitors to the area. During the late-nineteenth and early twentieth centuries, diking and filling reduced Bay salt marshes from an estimated 9,000 acres to only 900 acres today. Bay habitat has been further disturbed by discharges of agricultural and urban runoff, industrial and recreational uses, and colonization by invasive cordgrass.

#### *White Slough Unit*

The WSU totals ~70 acres in size and consists of diked former tidal marsh that was used for pasture. The management of this unit is constrained by its proximity to the railroad and Highway 101 (including the Tompkins Hill overpass) which bracket and split it into four different cells. There is a perennial spring upstream of this unit that contributes a small source of fresh water through the main cell and ultimately out to the bay. Brackish marsh constitutes the greatest acreage on the WSU. Vegetation types present include ~60 acres of brackish marsh dominated by salt grass, 10 acres of salt marsh dominated by cordgrass, one acre of freshwater riparian/swamp in the higher elevations along the eastern boundary of the unit, and 6 acres of freshwater marsh/agricultural wetland (Exhibit 1). The dikes were in poor condition when the land was acquired by the refuge and have not been maintained because this area was always expected to ultimately be allowed to revert to salt marsh, although subsidence of the former tidelands would result in conversion to mudflats if the dikes were allowed to breach without any other action being taken. There are several open water channels along the railroad, dike, and highway. There is one stream, Chism Creek, which flows between the two units that is channelized and discharges directly to Humboldt Bay. There are four tidegates in the northern area and a dozen culverts beneath Highway 101 that discharge runoff into this area. The southern area has seven culverts and one tidegate.

#### *Hookton Slough Unit*

The Hookton Slough Unit is ~444 acres of low, diked, former tidelands and tidal slough (Exhibit 1). During the early 1980s, the outer dike along the edge of Hookton Slough was rip-rapped and tidegate structures were replaced. The dike greatly prohibits tidal exchange but it also protects low spots on the county-owned Hookton Road from flooding. Hookton Road was constructed in the 1800s, and led to what was a docking point for sailing ships, which were taking crops from the Eel River Valley to other places of commerce. This road now acts as a dam that separates the unit hydrologically, except during the largest flood events. Prior to acquisition by the Service in the 1970s, the HSU was managed as agricultural grassland for cattle grazing. Upon acquisition, grassland management ceased and the area has been allowed to revert to seasonal and semi-permanently flooded wetlands. The unit is split by an interior dike that formerly provided landowners access to houses, barns, and the slough. A house and the two barns were removed by the USFWS in the 1980s and 1990s. The dike now provides the public access to recreational facilities constructed by the USFWS in the 1990s, including a 1.5 miles hiking trail, non-motorized boat dock, and vault toilets. The wetlands on either side of the dike receive seasonal freshwater input from drainage off Table Bluff and perennial freshwater input from springs. Both sides also receive limited tidal input by fish-friendly tidegates installed between 2003 and 2007.

The wetlands east of the interior dike have transitioned to a fresh to brackish wetland gradient ranging from more brackish saltgrass to fresher cattail (*Typha latifolia*), marsh pennywort (*Hydrocotyle ranunculoides*), and willow (*Salix hookeriana*). To the west of the dike, the lands were more aggressively drained and this area is more transitional, but also displays a fresh to brackish continuum. Although shortened by diking, Hookton Slough is tidal and could provide improved habitat for many estuarine species, including juvenile salmonids and the endangered tidewater goby, if it could be better reconnected to adjacent wetlands and have habitat complexity added in the form of large woody debris.

**Project History:** The Conservancy has worked with the HBNWR and others around Humboldt Bay for decades to protect and restore tidal marshes and other coastal habitats. Recent Conservancy projects with the HBNWR include support for public access development in the Ma-le'l Dunes Unit (2010, \$175,000) and for invasive *Spartina* eradication in the Refuge's tidal marshes (2008, \$57,000). The restoration of the White Slough Unit will demonstrate the beneficial reuse of sediment taken from the Martin Slough Restoration Project and/or from dredging of the Woodley Island and Eureka Marinas. The Conservancy provided a grant of \$100,000 to the Redwood Community Action Agency (RCAA) for restoration planning for Martin Slough, and Conservancy staff is currently engaged with RCAA in preparing environmental compliance for the Martin Slough Restoration Project, which is expected to begin construction in summer 2013 or 2014. In addition, the Conservancy provided a grant of \$85,000 to the Humboldt Bay Harbor, Recreation and Conservation District to study the feasibility of dredged materials reuse for marsh restoration and sea level rise adaptation. Conservancy staff is currently working with the HBNWR and other partners in the region to prepare a regional proposal to the North American Wetlands Conservation Act (NAWCA) program, and anticipates including the White Slough restoration project in the proposal. Compliance with the National Environmental Policy Act, Section 7 of the federal Endangered Species Act, and cultural resources compliance is required by June 2013 in order to include these projects in the NAWCA proposal. The HBNWR contacted the Conservancy about this project in fall 2012 and has been developing the project with staff since that time.

## PROJECT FINANCING

The initial project will cost \$30,000, which the Conservancy will provide. The anticipated source of funds is an appropriation to the Conservancy from the "California Clean Water, Clean Air, Safe Neighborhood Parks and Coastal Protection Fund" (Proposition 40). Under Public Resources Code Section 5096.650(b), Proposition 40 funds may be used for the protection and restoration of land resources in accordance with the provisions of the Conservancy's enabling legislation, Division 21 of the Public Resources Code. The proposed project is consistent with Chapter 5.5 of Division 21, as discussed below. Proposition 40 also requires the Conservancy to give priority to grant projects with matching funds (Public Resources Code Section 5096.651). The project is supported by a commitment by the USFWS to provide substantial in kind design services for completion of the project, and the project will allow the USFWS to seek implementation match funding in the upcoming NAWCA grant round.

In-kind contributions for the project in the form of staff resources will be extensive, through project design and project management by U.S. Fish and Wildlife Service staff.

**CONSISTENCY WITH CONSERVANCY’S ENABLING LEGISLATION:**

The proposed project is undertaken pursuant to Chapter 5.5 of Division 21 of the Public Resources Code (Section 31220) and pursuant to Section 31111, as follows:

Pursuant to Section 31220(a) and 31220(b), the Conservancy may undertake projects to protect and restore coastal habitats section if the project “protects or restores fish and wildlife habitat within coastal and marine waters and coastal watersheds.” Consistent with this section, the proposed authorization authorizes the use of funds to plan for the restoration of tidal marshes that provide habitat for fish and wildlife, including listed species, in Humboldt Bay.

Consistent with Section 31220(a), the Conservancy has consulted with the State Water Resources Control Board (SWRCB) in the development of the project to ensure consistency with Chapter 3 of Division 20.4 of the Public Resources Code regarding water quality.

Under Section 31220(c), Conservancy projects funded under this section must “include a monitoring and evaluation component” and be consistent with applicable Integrated Regional Water Management Programs, local watershed management plans, and water quality control plans adopted by the state or regional water quality control boards. The White Slough and Hookton Slough restoration plans will include monitoring and evaluation components. The consistency of this project with local and regional watershed and water quality plans is discussed in the “Consistency with Local Watershed Management Plan and Regional Water Quality Control Plan” section below.

Finally, Section 31111 provides that “the Conservancy may fund and undertake plans and feasibility studies, and may award grants to public agencies and nonprofit organizations for these purposes.” Consistent with this section, this project would provide for the preparation and permitting of plans to restore tidal marshes in Humboldt Bay.

**CONSISTENCY WITH CONSERVANCY’S 2012 STRATEGIC PLAN GOAL(S) & OBJECTIVE(S):**

Consistent with **Goal 5, Objective 5A** of the Conservancy’s 2012 Strategic Plan, the proposed project would develop a plan for the restoration of coastal wetlands.

**CONSISTENCY WITH CONSERVANCY’S PROJECT SELECTION CRITERIA & GUIDELINES:**

The proposed project is consistent with the Conservancy’s Project Selection Criteria and Guidelines, last updated on November 10, 2011, in the following respects:

**Required Criteria**

1. **Promotion of the Conservancy’s statutory programs and purposes:** See the “Consistency with Conservancy’s Enabling Legislation” section above.

2. **Consistency with purposes of the funding source:** See the “Project Financing” section above.
3. **Support of the public:** The project is broadly supported by the public (See letters attached as Exhibit 4).
4. **Location:** The proposed project would be located within the coastal zone of Humboldt County.
5. **Need:** The HBNWR does not have access to funds or staff for timely permitting of these restoration projects, and, absent Conservancy assistance, the opportunity to apply for NAWCA implementation funds this year would be lost.
6. **Greater-than-local interest:** The proposed project will lead to the restoration of tidal marsh in Humboldt Bay, which provides plant and wildlife habitat of regional and statewide importance for resident and migratory species.
7. **Sea level rise vulnerability:** Project planning will consider sea level rise vulnerability. The placement of fill at White Slough and potentially at Hookton Slough would increase resiliency to sea level rise by providing protection for wetlands and roads from inundation.

**Additional Criteria**

8. **Urgency:** Restoration of White Slough is urgent because the dikes protecting the restoration area are very eroded and could fail at any time, and because moving forward with planning and permitting will make it possible for the project to qualify for a time-sensitive federal funding opportunity and to be ready to receive fill when it becomes available. Restoration of Hookton Slough should occur as soon as possible to provide habitat benefits to listed species which are in critical need of recovery actions.
9. **Resolution of more than one issue:** The project would restore valuable fish and wildlife habitat, while providing protection for roads from sea level rise.
10. **Leverage:** The project leverages significant in-kind contributions from the US Fish and Wildlife Service in the form of staff time for restoration design.
11. **Innovation:** The White Slough Restoration would be the first demonstration of beneficial reuse of fill in the Humboldt Bay region.
12. **Readiness:** The USFWS has committed staff to restoration planning for these projects and is ready to move forward with contracting for permitting work.
13. **Realization of prior Conservancy goals:** See “Project History” above.
14. **Vulnerability from climate change impacts other than sea level rise:** Selection of species for the restoration planting palette will be designed to enhance resiliency to climate change, which may result in changes in precipitation and fog patterns as well as increased temperatures.
15. **Minimization of greenhouse gas emissions:** Restoration planning will attempt to minimize the transportation and cut and fill requirements for implementation, which are expected to be sources of greenhouse gas emissions from the project. Restored tidal marsh is expected to sequester more carbon than existing habitats.

**CONSISTENCY WITH LOCAL COASTAL PROGRAM POLICIES:**

The Humboldt Bay Area Plan (HBAP) of the Humboldt County Local Coastal Program (LCP), certified by the California Coastal Commission in 1982, supports planning to protect and enhance environmentally sensitive habitats, such as coastal marshes and dunes. The HBAP cites Public Resources Code Section 30240(a), a provision of the California Coastal Act, which states that “environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values” (HBAP Section 3.30, p. 38). In addition, the HBAP stresses the tremendous value of salt marsh, brackish marsh, dunes, and other natural habitats for fish and wildlife in Humboldt Bay (HBAP, Section 3.30(A), pp.39-40). The project will result in the restoration of coastal wetlands in Humboldt Bay. Therefore, the project is entirely consistent with the policies of the HBAP of the Humboldt County LCP, as discussed above.

**CONSISTENCY WITH LOCAL WATERSHED MANAGEMENT PLAN/  
STATE WATER QUALITY CONTROL PLAN:**

The project is consistent with, and furthers the goals of, the Humboldt Bay Management Plan (HBMP), prepared in May 2007 by the Harbor District. The HBMP expresses support for the goals of the proposed project in the following statement:

Salt marshes in the Bay have been reduced substantially in area with respect to their pre-settlement extent, and they continue to be lost. In addition, the extant salt marshes are degraded by the dominant presence of dense-flowered cordgrass. The benefits of shoreline-protecting salt marshes for stabilizing sediment and protecting shoreline structures from wave impacts combine with a conservation focus on maintaining or restoring salt marshes to make the restoration or enhancement of salt marshes an important concern for the District. (HBMP, p.129)

The proposed project is consistent with Objective CAS-3: “Maintain and enhance habitat for sensitive species” (HBMP, p.204), in that it will lead to the protection and restoration of habitat for Point Reyes bird’s beak and Humboldt Bay Owls Clover, both listed as endangered by the California Native Plant Society.

The project is consistent with, and furthers the goals of, the Humboldt Bay Watershed Salmon and Steelhead Conservation (HBSSC) Plan, prepared by the Humboldt Bay Watershed Advisory Committee in March 2005. The HBSSC Plan highlights the importance of the Bay’s tidal marshlands in supporting salmon populations, as well as diverse communities of fish and wildlife (p.11). The HBSSC Plan notes that estuarine habitat is necessary for the survival of salmon and that this habitat “has been significantly reduced by construction of levees and tidegates, and placement of fill” (HBSSC Plan, p.viii). One of the stated goals of the HBSSC Plan is to “Maintain and restore estuary processes that benefit salmonids” (HBSSC Plan, p.ix). The proposed project would further this goal by restoring tidal marshes, as discussed above in the “Project Summary” section.

The proposed project is also consistent with the Water Quality Control Plan for the North Coast (adopted by the Regional Water Quality Control Board North Coast Region in 1988 and last updated in 2007) in that it will enhance wildlife habitat, habitat for rare, threatened and endangered species, and estuarine habitat in Humboldt Bay. The Water Quality Control Plan for the North Coast designates wildlife habitat, rare, threatened, and endangered species habitat, and

estuarine habitat as beneficial uses of Humboldt Bay (Water Quality Control Plan for the North Coast, Table 2-1, pp. 2-8 to 2-12).

**COMPLIANCE WITH CEQA:**

The proposed project is statutorily exempt from the California Environmental Quality Act (CEQA), pursuant to 14 California Code of Regulations Section 15262. Consistent with Section 15262, the project will only involve preparation of planning and permitting documents, and will consider environmental factors. The project is also categorically exempt under Section 15306 in that it consists of basic data collection and resource evaluation activities which will not result in a serious or major disturbance to an environmental resource. Upon approval, staff will file a Notice of Exemption for this project.