

CONSERVING COYOTE VALLEY AGRICULTURE
FEASIBILITY STUDY
PHASE ONE REPORT



Sustainable Agriculture Education (SAGE)
March 2012

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Key Informants

The following people were interviewed and provided their expertise to the Phase One Feasibility Study: Sheila Barry, UC Cooperative Extension (UCCE); Amy Chestnut, Sonoma County Agricultural Preservation and Open Space District; Robert Colley, Information Services Department, County of Santa Clara; Ann Draper, Santa Clara Valley Water District and former Director, Santa Clara County Planning; Alan Forkey, NRCS, California Programs; Greg House, House Agricultural Consultants; Marc Landgraf, Peninsula Open Space Trust; Andrea McKenzie, Santa Clara Open Space Authority; Kellyx Nelson, San Mateo County Resource Conservation District; Julie Phillips, DeAnza College Kirst Center for Environmental Studies; Athena Pratt, USDA, Natural Resources Conservation Service; Laurel Prevetti, Deputy Director of Planning, City of San Jose; Ken Schreiber, HCP/NCCP Program Manager for Santa Clara County; Bill Shoe, Principal Planner, Santa Clara County; Don Weden, member, Friends of the Greenbelt (FROG) and former Principal Planner, Santa Clara County

Workshop with Technical Experts

The following people participated in the Conserving Coyote Valley Feasibility Study Workshop with technical experts on November 18, 2011: Sheila Barry, Central Coast Rangeland Coalition and UCCE; Bonnie Broderick, Santa Clara County Public Health; Jim Cochran, Swanton Berry Farm; Craig Edgerton, Silicon Valley Land Conservancy; Erin Gil, Grass Farm; Tim Heffington, Santa Clara County Parks; Melissa Hippard, Greenbelt Alliance; Julie Hutcheson, Committee for Green Foothills; Amy Hutzal, Bay Program, CA Coastal Conservancy; Shani Kleinhaus, Santa Clara Valley Audubon Society; Gary Knoblock, Moore Foundation; Sibella Kraus, Sustainable Agriculture Education; Wendy Lao, Coyote Valley Landscape Institute; Kirk Lenington, Midpeninsula Regional Open Space District; Andrea Mackenzie, Santa Clara County Open Space Authority Open Space Authority; Mark Medeiros, Veggielution at Emma Prusch Park; Dunia Noel, LAFCO; Kevin O'Day, Agriculture Commissioners Office; Joseph Okpaku, City of San Jose; Rachel Poplack, The Health Trust; Laurel Prevetti, City of San Jose; Troy Rahmig, ICF International; Bettina Ring, Bay Area Open Space Council; Paul Ringgold, Peninsula Open Space Trust; Don Rocha, Santa Clara County Parks; Ana Ruiz, Midpeninsula Open Space District; Elish Ryan, Santa Clara County Parks; Ralph Schardt, Michael Lee Foundation; Ken Schreiber, Santa Clara Valley HCP/NCCP; Bill Shoe, Santa Clara County, Planning; Diana Sokolove, Sustainable Agriculture Education; Neela Srinivasan, Coyote Valley Landscape Institute; Kathie Studwell, Sustainable Agriculture Education; Rebecca Tolentino, City of Morgan Hill; Don Weden, Santa Clara County Planning, retired planner; Eric Winders,

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Project Team

The project was led by Sibella Kraus, President of SAGE and Kathie Studwell, Project Manager. Project contributors include Jenika Florence, SAGE Associate; Diana Sokolove, SAGE Associate; Serena Unger, American Farmland Trust, Crystal Ward-Simmons, SAGE Associate. GreenInfo Network provided data analysis and mapping services.

EXECUTIVE SUMMARY

The Coyote Valley is an area of 7,408 acres, most of it farmland, located between San Jose and Morgan Hill in the Santa Clara Valley. For centuries an agricultural resource for the Bay Area, in recent decades the Coyote Valley has looked to development for its future. The valley encompasses three areas: North Coyote Valley (1,731 acres) which was designated Campus Industrial by San Jose in 1983; Mid-Coyote Valley (2,019 acres) which is designated Urban Reserve within the San Jose Sphere of Influence but is not yet annexed to the City; and the Coyote Valley Greenbelt (3,658 acres) which is designated as a non-urban buffer in an agreement with Santa Clara County, San Jose and Morgan Hill. The most recent effort to develop the North and Mid sections of the Coyote Valley, was a Specific Plan which was halted in 2008, primarily due to the economic downturn, before the EIR was completed.

The current Great Recession offers a rare moment to pause, regroup, and reconsider Coyote Valley's role in sustainable land use. San Jose and the Bay Area, like most California cities and metro-regions, are in the process of rethinking their future in accordance with sustainability principles and regional sustainability planning efforts. Due to its urban-edge location, its rich agricultural history, and its excellent agronomic conditions, the Coyote Valley may offer an extraordinary opportunity to re-invest in local sustainable agriculture as an integral element to sustainable community planning and implementation efforts.

The purpose of the *Conserving Coyote Valley Agriculture Feasibility Study* is to assess the potential for creating a permanent, economically viable and ecologically valuable, agricultural resource area. The Study is organized in two phases. The purpose of Phase One was to investigate existing conditions and to make a determination of baseline feasibility. This report, being released at the conclusion of Phase One, is a compilation of data for current land uses, regulatory context, agriculture, open space, natural resources and land values. It also contains information about resources available for agricultural land preservation and summarizes the considerable challenges as well as opportunities for permanently preserving Coyote Valley agriculture.

Based on the findings from the existing conditions research, opportunities and constraints analysis, and input from key informants and technical advisors, the project funder and Partner Group have concluded that there is sufficient baseline feasibility to warrant moving ahead to Phase Two.

The preliminary vision statement below, which will inform Phase Two, is a synthesis of the input from the project advisors and the project team.

*“The Coyote Valley is home to a regionally significant eco-agricultural **resource area** that permanently conserves prime farmland and key habitat; ensures livelihoods for its farmers, ranchers and agricultural employees; provides healthy food and a recreational amenity for Bay Area communities; and protects important ecological and cultural resources of the region.”*

The purpose of Phase Two is: (1) to refine the overall vision and formulate objectives; (2) evaluate specific conservation mechanisms and financing models that could be employed to support economically viable agricultural operations and an ecologically valuable resource area; and (3) to identify potential implementation strategies and options for governance and ongoing management. Phase Two will also define the “service area” for Coyote Valley agriculture and the economic and environmental benefits that would accrue to the surrounding community and to the Bay Area. Phase Two will commence in January and is expected to take six to eight months to complete.

The *Conserving Coyote Valley Agriculture Feasibility Study* is being conducted by SAGE (Sustainable Agriculture Education) with funding from the San Francisco Bay Area Program of the State Coastal Conservancy. The project is advised by a Partner Group representing the Coastal Conservancy, Santa Clara County Open Space Authority and The Health Trust.

INTRODUCTION

Background

The Coyote Valley is an area of 7,408 acres, most of it farmland, located between San Jose and Morgan Hill at the southern end of the Santa Clara Valley. As the last significant remnant of the fabled Valley of Heart's Delight (now called Silicon Valley), the Coyote Valley has deep, rich soils, plentiful water, and a year-round growing climate. In various epochs, the land has supported grazing, nursery businesses, orchards, row crops, and field crops.

The North Coyote Valley (1,731 acres) which was designated Campus Industrial by San Jose in 1983, and the Mid-Coyote Valley (2,019 acres) which is designated Urban Reserve within the San Jose Sphere of Influence, have been slated for urban development for decades. The southern section, also called the Coyote Valley Greenbelt (3,658 acres) is designated as a non-urban buffer in an agreement with Santa Clara County, San Jose, and Morgan Hill. The most recent effort to develop the North and Mid sections of the Coyote Valley, was a Specific Plan which aimed to bring 50,000 jobs and 25,000 dwelling units to the area. Primarily due to the economic downturn, the Specific Plan work was halted in 2008 before the EIR was completed. However, the planning work was sufficiently detailed that it was released by the City as the "Coyote Valley Plan – A Vision for Sustainable Development". Ironically, the seeming inevitability of large-scale development has resulted, at least temporarily, in most of the valley remaining in large open parcels.

Agriculture remains the predominant land use in the valley, even though it is generally practiced as a holding pattern. In the rolling hills to the east and west of the valley, large range land holdings operate with more of a sense of permanence. Studies initiated in part as a response to the development planning process, have recently demonstrated the environmental importance of the Valley as a wildlife corridor between the Diablo and Coastal ranges.

Project Inspiration, Purpose and Phasing

The current Great Recession offers a rare moment to pause, regroup, and reconsider Coyote Valley's role in sustainable land use. San Jose and the Bay Area, like most California cities and metro-regions, are in the process of rethinking their future in accordance with sustainability principles. Due to its location, its history, and its superior agronomic conditions, the Coyote Valley may offer an extraordinary opportunity to re-invest in local sustainable agriculture as an element integral to sustainable community planning and implementation efforts.

The purpose of the *Conserving Coyote Valley Agriculture Feasibility Study* is to assess the potential for creating a permanent, economically viable and ecologically valuable, agricultural resource area. The Study is organized in two phases. The purpose of Phase One is to investigate existing physical, regulatory and land value conditions in order to make a determination of baseline feasibility. The purpose of Phase Two is to refine the project vision and to develop a high level blueprint for implementation. The deliverables for Phase Two, which will commence in January and take six to eight months to complete, are both the blueprint plan and consensus on the plan by an expanded group of stakeholders including those with the highest stake, the current landowners.

Components of Phase One Feasibility Study

Phase One commenced in June 2011 with a convening of the Project Partners to refine the work plan, to identify the key data sets needed to compile an existing conditions report, and to identify the key informants and technical experts needed to help the project team understand and assess the existing conditions data.

Following review by the Project Partners, the preliminary existing conditions data was presented to the Santa Clara County Open Space Authority Public Advisory Committee in October. A revised and expanded version of the preliminary existing conditions data was presented in November at a Workshop for Technical Experts that engaged 39 people from agencies and organizations with technical background information about Coyote Valley agriculture, natural resources, land uses, and regulatory framework. Workshop participants provided feedback about the findings, refined the project vision, proposed high-level conceptual site plans, and outlined key strategies and mechanisms necessary to realize the vision. At the conclusion workshop, participants recommended to the project funder and Project Partners that there was sufficient baseline feasibility to warrant moving ahead to Phase Two.

This report presents the findings from the existing conditions research and feedback and makes the case for sufficient baseline feasibility to warrant moving ahead to Phase Two.

OVERVIEW OF EXISTING CONDITIONS

Current Land Uses

Location and Regional Context

Coyote Valley is a primarily rural area located at the southern end of the San Francisco Bay between the cities of San Jose to the north and Morgan Hill to the south. Its eastern boundary is the environmentally significant Coyote Ridge, a part of the Diablo Mountain Range, and its western boundary is the Santa Cruz Mountains. The valley is a historically agricultural region that has also become recognized for its rich and unique environmental qualities. (See Aerial map in appendix.)

Acreage, Parcelization and Major Land Uses

Coyote Valley encompasses 7,408 acres and has three distinct areas: the North Valley, the Mid Valley and the South Valley, known as the Greenbelt. (See Basemap in appendix.)

Table 1: Total Geographic Area of Coyote Valley

Region	Acres
North Valley	1,731
Mid Valley	2,019
South Valley	3,658
Total Coyote Valley	7,408

Source: County of Santa Clara, 2011

Total Coyote Valley acreage (7,408 acres) in Table 1 encompasses the entire land mass of the valley. The total Coyote Valley acreage (6,817 acres) in Table 2 is the total parcel acreage within the valley. The difference of approximately 600 acres is accounted for by roads and parcels that are partially within the Coyote Valley, but have a centroid that falls outside of the valley boundary.

Table 2: Parcel Count per Region (Includes parcels with centroid in Coyote Valley)

Region	Acres	# of Parcels
North Valley	1,584.8	74
Mid Valley	1,899.3	270
South Valley	3,333.1	430
Total Coyote Valley	6,817	774

Source: County of Santa Clara, 2011

The North Valley has historically been used for grazing and field crops and the preponderance of large parcels reflects this. While parcels along Monterey Highway are much smaller, those farther west average over 40 acres. IBM's Coyote Valley Research Park, built in the mid-1970s, is the only large, non-agricultural use in the North Valley. This area has been incorporated into the City of San Jose and it has been designated in the General Plan for industrial campus development, similar to that existing at IBM. However, despite this designation existing since the early 1980s, no new business parks have been developed and the land continues to be farmed or grazed.

The Mid Valley, 2019 acres, is characterized by more intensive agriculture and limited rural residential development. Except for subdivisions and ranchette properties located towards the southern edge of the mid-Valley, most of the parcels are 10 – 100 acres.

South Valley, 3658 acres, designated as the Greenbelt, is characterized by an abundance of relatively small (1 to 20 acres) parcels, most with residences. There are a few notable intensive agricultural activities, including orchards, greenhouses, and mushroom growing.¹

Table 3: Parcel Sizes and Percentage of Land Area by Region of Coyote Valley

Parcel Size	< 1 acre		1-4 acres		5-9 acres		10-19 acres		20-39 acres		40-99 acres		> 100 acres	
	# of parcels	% of area												
North Valley	19	1%	20	3%	6	3%	9	9%	6	12%	11	43%	3	31%
Mid Valley	79	1%	103	13%	36	14%	25	19%	15	19%	12	34%	-	-
South Valley	85	1%	199	14%	79	18%	46	19%	7	7%	7	14%	7	27%

Source: County of Santa Clara, 2011 *may not total to 100 due to rounding

The typical land uses on parcels along the Monterey Highway are commercial or industrial in nature, meant to serve the needs of travelers or provide services to farmers in the area.

The County has developed a parkway that runs the full length of Coyote Creek as it meanders through the valley. Within this park are several different recreation areas, a small historic town/cultural center, and the Coyote Creek Trail.

¹ Coyote Valley Specific Plan DEIR, Section 4.1.1, Existing Uses, March 2007.

Table 4: Coyote Valley Land Uses

	North Valley (acres)	Mid Valley (acres)	South Valley (acres)	Total Coyote Valley (acres)
Agricultural, Extractive and Open Space (total)	244	1,249	1,503	2,996
Intensive, Livestock Dairy. Other Animals	-	27	16	43
Intensive, Non-orchard. Field Crops, Timber	158	781	332	1,271
Orchard	86	339	784	1,209
Pasture, Grazing and Range Land		38	134	172
Quarries, Oil, Gas, Other	-	-	3	3
Flower Growers		58	234	292
Reservoirs, Water Supply, and Flood Control Lands	-	6	-	6
Industrial Non-Manufacturing (total)	-	10	39	49
General Industrial Non-manufacturing ¹	-	6	1	7
Grain Storage, Stockyard, Packing Services	-	-	12	12
Lumber and Other Building Material Dealers	-	-	26	26
Yards ²	-	4	-	4
Manufacturing (total)	200	-	38	238
Electrical Machinery and Electronics	200		-	200
Food and Kindred Products, Wineries	-	-	38	38
Other Shopping Areas (total)	1	2	11	14
Retail Uses ³	1	2	11	14
Other Urban (total)	1,066	259	519	1,844
Recreational Facilities ⁴	-	40	303	343
Vacant Urban	1,066	219	216	1501
Public and Quasi-Public Buildings and Uses (total)	-	5	14	19
Camps, Campgrounds	-	3	14	17
Other Public Open Space Uses	-	2	-	2
Residential (total)	14	179	465	658
Single Family	14	179	465	658
Transportation, Communications and Utilities	13	-	-	13
Utilities and Communication	13	-	-	13

Notes:
¹ Or combination of manufacturing and non-manufacturing
² For equipment and supplies of contractors, public utilities, government
³ In other than regional, community, and neighborhood shopping centers
⁴ Athletic clubs, country clubs, card rooms, golf courses, fitness centers, rod & gun clubs, YMCA, swim & racquet Clubs

Source: Santa Clara County, 2011

Ownership and Tenant Patterns

The 7,408-acre Coyote Valley has 606 parcels owned by 105 distinct individuals and organizations. Most of the Valley is in private ownership. Only 15 percent of the land is in public ownership.

Table 4: Coyote Valley Land Ownership

Type	Agency	Acreage
City	City of San Jose	82
County	Santa Clara County Parks and Recreation Dept., County of Santa Clara, Water District	900
Non-Governmental Organization	Silicon Valley Land Conservancy	0.6
Special District	Santa Clara County Open Space Authority	53
Schools	Morgan Hill Unified School District	88
Churches		12
Private		5,748
Total		6,885²

Source: Santa Clara County, 2011

A significant amount of the acreage in large parcels, including those that are in agricultural production, is owned by investment groups or other companies holding the land for future development. Notable among these are: Campus Park Associates, LP; Cisco Technology Inc., Coyote Valley Research Park LLC; IBM; Shapell Industries; WP Investments and Xilinx.

Larger land owners that also farm the land include Ando Farms (vegetables); Filice Estate Vineyards (cherries); the Mary Marchese Trust (cherries); and Tilton Ranch, Inc. (grazing and field crops). Land held for investment purposes is farmed by a few tenant farmers. The company that farms the largest amount of land is G & G Farms, which primarily grows alfalfa, oats and wheat. Other large farmers include: Spina Farms, which grows corn, pumpkins, and other vegetables on 200 acres of leased land; G & K Farms which grows hay; Coyote Creek Ranch which also grows oats and other grains; and Grass Farms which grows sod.

Circulation and Power Infrastructure

US 101, the Monterey Highway in the eastern part of the valley and the Santa Teresa Boulevard in the middle of the valley, are all north-south thoroughfares that connect to the San Jose metropolitan area and the broader San Francisco Bay region to the north with the southern Santa Clara Valley and Monterey Bay area to the south.³ Major east-west arterials include Bailey Road, Laguna Avenue and Palm Avenue.

² Difference is total acreage between Table 2 and Table 4 is attributed to the method by which parcels were split for data analysis

³ The Monterey Highway is part of the historic El Camino Real, which extends from Santa Rosa to San Diego. The Monterey Highway portion connects two of the 21 missions built by the Spanish in the mid-18th Century--the Mission de Santa Clara to the north and the Mission San Juan Bautista to the south. El Camino Real, which started off as a footpath, later became a major

The Caltrain Commuter Rail, which runs from San Francisco to Gilroy, runs parallel and proximate to the Monterey Highway. In the early 20th century, there was a train stop at Coyote Hamlet. The closest train station now is in Morgan Hill. The Coyote Valley is one of two final alignments under consideration for the pending High Speed Rail route as it enters the San Francisco metropolitan region.

Valley Transportation Authority's plans call for the extension of the Santa Teresa light rail line to Bailey Road.

The Metcalf Energy Center (MEC) is a 600-megawatt power generation facility built by Calpine Corporation that utilizes natural gas for fuel. MEC's 20-acre site is located at the base of Tulare Hill at the north end of Coyote Valley across Monterey Highway from the existing 40-acre PG&E substation.

Cultural Resources

A low to moderate number of cultural resources have been recorded within the 7,400 acres of the Coyote Valley area. These cultural resources include prehistoric and historic archeological sites, architectural resources, and arboricultural resources. Resource identification and location rely on archival data for recorded cultural resource sites and isolates (as mapped by CHRIS/NWIC), potential historical site identified by previous researchers, buildings illustrated by Thompson and West (1876), listed architectural and arboricultural properties within the Coyote Specific Plan area, and potential architectural properties identified during a preliminary windshield survey.⁴ Table 5 summarizes the resources reported in the Coyote Valley Cultural Resources Report (January 2004).

A total of 35 prehistoric archaeological sites have been recorded (Note: two of these sites are included in the totals for two different subareas). Four of the prehistoric sites have been evaluated and found to be eligible for inclusion on the National/California Registers, and two of the sites have been determined eligible as part of a district. The remaining 29 prehistoric sites have not been evaluated.⁵ Research and available archaeological data suggests a moderate sensitivity for buried prehistoric cultural resources within the valley with a high sensitivity for resources near the former edges of the Laguna Seca marshlands.⁶

Native American resources include a former major village site noted by early Spanish explorers in the North Valley, other habitation locations, and a trail. Site locations appear to favor benches, terraces and ridges along canyons above their mouths, water courses, marsh margins, and the alluvial plain.⁷

Historic Period sites include resources from the American Period (post-1850). No resources associated with the earlier Spanish and Mexican periods appear to be present in the Coyote Valley (CVSP area). Four American Period archeological sites have been recorded, including two multi-component sites that

stagecoach and mail route. Coyote Valley's historic Coyote Grange is part of Coyote Hamlet, now part of the Santa Clara County Parks system.

⁴ Coyote Valley Specific Plan (CVSP), *Cultural Resources Report*, January 2004, p.24-24

⁵ CVSP, *Cultural Resources Report*, January 2004, p.25

⁶ CVSP, *Cultural Resources Report*, January 2004, p.2

⁷ CVSP, *Cultural Resources Report*, January 2004, p.3

have been evaluated as eligible for the National/California Registers (included in the prehistoric totals). Resources from the American Period include the hamlet of Coyote, farmsteads/ranches, residential, commercial and public properties, transportation related and water control, wineries, quarries, etc.⁸

The majority of historic resources consist of buildings and structures from the early 20th century and are centered in the hamlet of Coyote, which could qualify as a historic district.⁹

Table 5: Summary of Cultural Resources

Resource Type <i>(recorded and/or identified)</i>	North Valley	Mid-Valley	South Valley
Prehistoric Archaeological	10	8	19
Archaeological	0	2	0
Hispanic Period Archaeological Site	0	0	0
American Period (post -1850) Archaeological Site	0	1	1
American Period (post -1850) Archaeological Deposits	5	12	4
Architectural	7	13	0
Arboricultural	4	3	2

Source: Coyote Valley Cultural Resources Report, p. 25-26 (January 2004)

⁸ CVSP, *Cultural Resources Report*, January 2004, p.3

⁹ CVSP, *Cultural Resources Report*, January 2004, p.3

Regulatory Context

The General Plans of the City of San Jose and the County of Santa Clara regulate land uses in the Coyote Valley. This section describes the specific General Plan designations and their impact on potential uses in the three sections of the Valley. Tables 6 and 7 below, outline minimum lots sizes and allowable uses for each General Plan. The San Jose Envision 2040 GP and the Santa Clara County GP include designations that apply to lands in the Coyote Valley. (See Policy Framework: County of Santa Clara and Policy Framework: San Jose and Morgan Hill maps in appendix.)

North Valley

The North Valley, comprising 1,731 acres, is within San Jose’s City Limits and its Urban Service Area. The City’s General Plan update, Envision 2040 which was adopted in November 2011, designates the North Valley as “Campus Industrial”. This designation would allow for enough office and industrial space to be built to accommodate 50,000 jobs. Assuming an average of 400 sq. ft. per worker, over 20 million square feet of building space would need to be constructed to accommodate these workers.

Table 6: Summary of San Jose Envision 2040 Policies

Designation	Allowable Uses
Campus Industrial	<p>Primarily located in North Valley, which is within the City limit, the uses allowed in this category are industrial research and development, administration, marketing, assembly, and manufacturing. Warehousing is allowed only when strictly ancillary to the primary uses. For purposes of sizing the required infrastructure for North Coyote Valley, the approximately 1440-acre area is assumed to accommodate 50,000 employees based on an employee density of 40 employees per acre.</p> <p>Within the North Valley, the current zoning varies. The zoning designations described below refer to San Jose Policy Framework Map in the Appendix.</p> <ul style="list-style-type: none"> • Agriculture: Agriculture, child care facility, trails & pathways, solar energy facility, single residence w/ CUP. • Agriculture areas with a Planned Development Overlay require a Planned Development Permit • R-1-1 Single Family: Single family, 1 unit per acre • R-1-5 Single family: 5 units per acre • R-MH Single family: 7 mobile homes per acre • CP Commercial: Pedestrian-oriented commercial uses • HI Heavy Industrial: Industrial uses
Urban Reserve	<p>Primarily located in Mid-Coyote Valley, the Coyote Valley Urban Reserve generally encompasses the area between the Coyote Greenbelt and the North Coyote Campus Industrial Area. Only agricultural and rural residential land uses which are the existing, predominate uses in the area are allowable. All uses must comply with County General Plan and zoning requirements.</p>

Source: San Jose Envision 2040 (Adopted November 2011)

Mid-Valley

Mid-Valley is unincorporated, but it is within San Jose’s Urban Growth Boundary (UGB). It is outside of San Jose’s Urban Service Area (USA) and any development requiring urban services, such as water and sewer, would require approval of an extension of the San Jose’s USA from the Local Agency Formation Commission (LAFCO). Envision 2040 designates Mid-Valley as “Urban Reserve”, and further stipulates that no urban development will occur there for another 30 years. Any future development would result only from a General Plan Update that would plan and phase growth based on need and ability to provide necessary infrastructure and services.

County General Plan and Zoning designations regulate all land use within Mid-Valley. The County designates this area, encompassing about 2,019 acres, as “Large-Scale Agriculture”. Allowable uses are limited to agriculture and residential and the minimum lot size is 40 acres.

South Valley

South Valley is also unincorporated. Though it is within San Jose’s Sphere of Influence, it is outside the City’s Urban Service Area as well as its Urban Growth Boundary. The County General Plan (1994) designates this entire area, about 3,658 acres, as Medium Scale Agriculture. Allowable uses are limited to agriculture and residential and the minimum lot size is 20 acres.

Table 7: Summary of Santa Clara County General Plan Policies

Designation	Allowable Uses
Agriculture Large Scale	Minimum Parcel Size = 40 acres Located primarily in the Mid-Valley. Agriculture and ancillary uses
Agriculture Medium Scale	Minimum Parcel Size = 20 acres Located primarily in South Valley or “Greenbelt” area. Agriculture and ancillary uses
Roadside Services	Services for the current motoring public, including: restaurants; motels; recreational facilities which require a rural setting; wine tasting rooms; farmers markets; gas stations; and similar uses
Monterey Highway Use Permit Area	Legally established land uses fronting Monterey Highway, south of Metcalf Road, in areas designated “Agriculture” and “Rural Residential” shall continue as allowable uses by right or by use permit, depending on the regulations governing their original establishment. To protect the area from undesirable strip commercial development, additional service uses will not be extended along Monterey Road.
Ranchlands	Minimum parcel size = 20 acres Primarily at the eastern and western edge of the Valley, where elevations start to increase. The intent of the “Ranchlands” designation is to maintain the existing conditions of very low intensity uses, rural lifestyle, and limited public access.

Source: Santa Clara County General Plan (Adopted December 1994)

Santa Clara Valley Habitat Plan

The North Valley and Mid-Valley sections of Coyote Valley are covered by the draft Habitat Conservation Plan (HCP) currently being finalized by Santa Clara County and its five partners (Santa Clara Valley Transportation Authority (VTA), Santa Clara Valley Water District (SCVWD), Morgan Hill, San Jose and Gilroy). As such, once the HCP is adopted by the County and the Cities, likely in mid 2012, owners and developers of lands located within North and Mid-Coyote Valley will need to comply with all requirements of the Plan. The information below is based on the September 2011 HCP report.

Proposed Private Development Coverage Area

The HCP covers all types of urban and rural development that requires a building and/or grading permit; includes residential, commercial and industrial development as well as renovation, replacement and upgrades of existing facilities. It applies to all development locations that affect serpentine, riparian, and wetland land cover types, streams, ponds. Whenever a grading permit or building permit is required, a mitigation fee will be assessed. Activities covered by the Plan, and that will be subject to mitigation fees are listed below.

Proposed Covered Activities

- Residential, commercial and industrial development
- Renovation, replacement and upgrades of existing facilities
- Intensive agriculture activities that require approval consistent with local general plans, including mushroom farms, commercial stables, equestrian facilities and wineries
- Vegetation management including fuel reduction, tree removal, pruning
- Public and private service facilities including fire stations, police stations, cultural facilities, recreational facilities and fields, waste management facilities
- Most solar energy projects
- All activities associated with implementation of the Plan's conservation strategy

Proposed Activities Not Covered by the Habitat Plan

- Private sector activities that do not obtain a development, grading, building or other construction permit (such as Ag Exempt) are not covered for incidental take and do not pay fees
- Routine and ongoing agricultural activities outside the planning limit of urban growth are not covered for incidental take and do not pay fees
- Expansion of cultivated agriculture into natural lands is not covered for incidental take and does not pay fees unless a grading permit is required
- Vineyard development that is not assessed by the County through a County permit process is not covered for incidental take and does not pay fees
- Installation and operation of groundwater wells are not covered for incidental take and do not pay fees.
- Projects that do not require local approval by the Permittees¹⁰

Proposed Exempted Activities

¹⁰ County of Santa Clara, Cities of San Jose, Morgan Hill and Gilroy, Valley Transportation Authority and Santa Clara Valley Water District.

Exempted activities are exempted from the conditions of the Plan and still receive take coverage because the probability of take is so low that the cost of enforcing conditions on the projects would not provide a net benefit for the species. Exempted activities include:

- Projects that do not result in ground disturbance to land and that do not result in the release of potential water quality contaminants or create wildlife barriers.
- Covered activities on less than 0.5 acre.
- Additions to structures that result in less than 2,000 square feet of impervious surface.

Table 8: Proposed Land Cover and Special Fees

Development Fees	
Zone A: Ranchlands and Natural Lands	\$16,660 per acre
Zone B, Mostly cultivated Agricultural Lands	\$11,610 per acre
Zone C, Small Vacant Sites between 2 and 10 Acres Surrounded by Urban Development	\$4,140 per acre
Special Fees	
Nitrogen Deposition Fee	\$3.29 per new vehicle trip
Western Burrowing Owl Nesting Habitat	\$19,960 per acre
Serpentine Land	\$43,990 per acre
Wetland Fees	
Willow Riparian Forest and Mixed Riparian	\$129,330 per acre
Central California Sycamore Woodland	\$237,130 per acre
Freshwater Marsh	\$157,540 per acre
Seasonal Wetlands	\$343,710 per acre
Pond	\$141,470 per acre
Stream (per linear foot)	\$525 per linear foot

Source: HCP, "Proposed Revisions to the Draft Santa Clara Valley Habitat Plan: A Framework for Preparing a Final Plan," September, 2011

Depending on the nature of desired improvements on agricultural parcels, including homes, packing shed, barn or greenhouse, the requirement to pay the fees listed above, could act as a disincentive to engage in agriculture in the Coyote Valley.

Farmland and Agriculture Production

Santa Clara County Agriculture

A half century ago, Santa Clara County was one of the most productive farming regions in the nation. With deep, fertile soils, moderate climate and plentiful water, it was once part of the fabled “Valley of Heart’s Delight,” renowned for its apricots, cherries, prunes, berries, nursery products, and flowers. Before World War II, Santa Clara orchards produced one-third of all the stone fruit grown in the United States. San Jose was the largest canning and dried-fruit packing center in the world.¹¹ Fast-forward to the 21st century: Santa Clara County has one of the fastest growing populations in the Bay Area; it is one of the region’s major economic engines, a world center of technological innovation; and it is expected to absorb a greater share of population and job growth than any other county in the region over the next few decades. Yet the county hangs on as one of the Bay Area’s most productive agricultural regions, with 23 different agricultural crops, over 31,000 acres of cropland, and almost 400,000 acres of grazing land. In 2010, its agricultural production was worth over \$266 million. Whether Santa Clara County will remain an agriculturally productive region in years ahead remains to be seen.

Since 2000, the county has seen an overall decline in agricultural production of 29 percent. Most major crop categories have declined over the ten-year period, with floral crops and nursery crops dropping 68 percent and 55 percent, respectively. Milk and egg production lost double their value from ten years ago and livestock and poultry dropped by 33 percent. The decline in production value, in part, reflects the loss of farmland in Santa Clara County to urban development. The California Department of Conservation shows that the county lost 29 percent of its important farmland between the years of 2000 and 2008.

Despite an overall decade of declining value, many crops have seen growth over the same period. In 2010, nursery crops (\$90.6 million), mushrooms (\$60.7 million), and bell peppers (\$13.4 million) were the top three crops. Santa Clara County, known as a leader in the state for its productive mushroom production, had seven mushroom growers, on a total of 149 acres of land that produced over \$60 million in 2010. Mushrooms make up 23 percent of the county’s total production value. Over the last ten years, the value of mushroom crops has grown by 18 percent in the county.

Though smaller in scale, the biggest growth over the last decade has been with the county’s berries (34 percent increase in value). Vegetable crops (which includes mushrooms) increased by 22 percent in value. In 2010, the county saw a 2 percent increase in agricultural value over the previous year.

Coyote Valley Agriculture

Agricultural production in Coyote Valley is still a significant land use and makes up a considerable share of the county’s total agricultural value. Though data is not available for the ten-year trend of agriculture in Coyote Valley, trends in this area are likely reflective of the county. Based on estimated acres of

¹¹ Sustaining Our Bounty, An Assessment of the Current State of Farming and Ranching the San Francisco Bay Area, American Farmland Trust, Greenbelt Alliance, Sustainable Agriculture Education (SAGE), 2011

production for crops from the Santa Clara Agricultural Commissioner's office, the Valley is currently producing approximately 3,650 acres of harvested crops (compared to around 14,7000 in the county) worth almost \$33 million, representing 15 percent of the County's total agricultural gross value. In addition, the Agricultural Commissioner's Office designates another 2,430 acres of adjoining rangeland (compared to almost 210,000 acres of rangeland in the county) as being within the Coyote Valley area. Although rangeland is by far the largest agricultural land use in the county, its production value of \$11 per acre is by far the smallest per acre production value in the county.

Table 9: Santa Clara County and Coyote Valley Agricultural Activity

	Santa Clara County 2010 (a)			Coyote Valley Estimates (c)		
	Acres	Total Value	\$/acre	Acres	Est. Value	As % of County Value
Mushrooms	149	\$60,772,000	\$407,866	6	\$2,447,195	4%
Nursery Crops (b)	721	\$90,604,600	\$125,665	190	\$23,876,386	26%
Chrysanthemums		\$1,274,000	\$35,744	6	\$214,464	17%
Other Vegetables	183	\$2,142,000	\$11,705	8	\$93,639	4%
Tomato, Fresh	740	\$8,198,000	\$11,078	-	\$0	0%
Chinese Vegetables	480	\$4,817,000	\$10,035	62	\$622,196	13%
Cherries	597	\$5,123,000	\$8,581	344	\$2,951,946	58%
Celery	176	\$1,408,000	\$8,000	-	\$0	0%
Peppers, Bell	1,679	\$13,373,000	\$7,965	89	\$708,873	5%
Beans	717	\$4,845,000	\$6,757	36	\$243,264	5%
Cabbage	203	\$1,320,000	\$6,502	3	\$19,507	1%
Spinach	621	\$4,026,000	\$6,483	3	\$19,449	0%
Lettuce, All	1,935	\$10,948,000	\$5,658	5	\$28,289	0%
Other Fruit	221	\$1,145,000	\$5,181	30	\$155,430	14%
Onions, Dry	190	\$958,000	\$5,042	-	\$0	0%
Walnuts	164	\$480,000	\$2,927	17	\$49,756	10%
Corn	1127	\$2,976,000	\$2,641	89	\$235,017	8%
Pumpkin	123	\$290,000	\$2,358	73	\$172,114	59%
Other Field Crop (c)	365	\$350,400	\$960	510	\$489,600	140%
Hay, Grain	3,794	\$895,000	\$236	1,722	\$406,218	45%
Pasture	471	\$84,800	\$180	137	\$24,666	29%
Range	209,97	\$2,310,000	\$11	2,426	\$26,689	1%
Uncultivated	n/a	n/a	n/a	324	n/a	n/a
Total Production (a)	224,66	\$218,339,800	\$972	6,080	\$32,784,697	15%

Notes:

- (a) Does not represent all crops produced in Santa Clara County. Represents only those which are produced in Coyote Valley.
- (b) In Coyote Valley, nursery crops include turf, bedding plants, flowering plants, and Christmas trees. The estimated value for each these crops is based on the average value for all nursery plants. Therefore, lower-value crops like turf, which is a popular crop in Coyote Valley, may be overvalued in this estimate.
- (c) Estimated acres are based on a survey asking producers to estimate the following year's crop production, collected by the Santa Clara Agricultural Commissioner's office. Some crops, such as Other Field Crops, may be over-estimated.

Source: Santa Clara County, 2011

What gives the Valley a substantial marker in the county's overall agricultural economy is its level of production of high-value crops that are grown with a limited amount of land. Mushrooms, by far, yield

the highest value per acre. Valued at over \$400,000 per acre they account for less than one percent of the Valley's total harvested acres, yet seven percent of the Valley's total production value. Nursery products are the Valley's leading crop in overall value and have the second highest per acre value with a yield of \$126,000 per acre. Estimated at almost \$24 million, nursery products account for almost 70 percent of the Valley's total production value, representing only five percent of the Valley's harvested acres. Chrysanthemums have the third highest per acre value with a yield of \$35,744 per acre. Cherries, although they have the second highest production value, estimated at almost \$3 million over 344 acres, have the seventh highest production value on a per acre basis. Other notable high-value crops include Chinese vegetables, celery, peppers, beans, fresh tomatoes, and miscellaneous vegetables (including artichokes, cauliflower, cucumber, herbs, and shallots), which yield between \$8,000 and \$11,000 per acre. Together, these crops, along with nursery and floral crops account for 82 percent of the Valley's production value, yet account for only 11 percent of its total harvested acres.

While some small pockets of the Valley are experiencing investment in high-value crops, the majority of acres in the Valley are dedicated to low-value crops, with 80 percent of estimated harvested acres in field crops (hay, pasture, and range). Excluding range lands from this estimate, 57 percent of estimated harvested acres in the Valley are dedicated to hay and pasture. At the same time, these crops make up only two percent of the Valley's agricultural value. (See Agriculture Production map in appendix.)

Some growers assert that parts of the Valley are restricted in the agronomic conditions needed for higher-value crops. Restrictions cited include high water tables and flood prone areas, especially in part of the north and mid-Valley, infestations of invasive fauna (e.g. ground squirrels, feral pigs, wild turkeys), and heavy clay or infertile soils. Other factors cited by land owners and growers to explain lack of investment in higher value crops include expectation of development, burdensome regulations, and the marginal returns and high risk of agriculture in general.

With expectation of urban development, the return on investment for high value crops is far less than the value of the land if sold for urban uses. Given an urban growth scenario, it is likely that land owners convey short-term leases for these lands which disincentivizes tenant farmers to invest in high value crops. This effect of *planned* urbanization has been widely understood globally throughout the urbanizing world to create land holding patterns and disinvestment in agriculture.

Protected Open Space

Coyote Valley both encompasses and is surrounded by protected open space that is managed either for the conservation of sensitive environmental habitat or for recreational purposes. The following discussion describes specific open space area depicted on the Open Space map located in the appendix.

There are multiple entities that own and manage these areas. They include:

- Santa Clara County Open Space Authority
- Santa Clara Valley Transportation Authority
- Santa Clara County Parks and Recreation Department
- Silicon Valley Land Conservancy

Santa Clara County Open Space Authority (SCCOSA)

Coyote Scenic Lands

The only protected open space owned by the SCCOSA that is partially within Coyote Valley is the recently acquired Coyote Scenic Lands comprising 348 acres on the western edge of the Valley at the western terminus of Palm Avenue. A number of special-status species are known to occur here, including Bay Checkerspot butterfly, Opler's Longhorn moth, Golden eagle, Santa Clara Valley *Dudleya*, Smooth lessingia, and most beautiful Jewelflower.

Rancho Cañada del Oro Open Space Preserve

Further to the west at the foothills of the Santa Cruz Mountains and west of Bailey Avenue, is another preserve, Rancho Cañada del Oro Open Space. This 3,882-acre preserve was opened to the public in 2004.

Santa Clara Valley Transportation Authority Property on Coyote Ridge

To offset the impacts of highway projects in the area, the Santa Clara Valley Transportation Authority (VTA) purchased 548 acres of critical Bay Checkerspot butterfly habitat on Coyote Ridge.

Santa Clara County Parks and Recreation Department (SCCPRD)

The Coyote Creek Parkway is the only park owned by the SCCPRD within the Coyote Valley. The other parks described below comprise some of the surrounding open space.

Coyote Creek Parkway and County Park

The County owns and maintains nearly 290 acres of riparian habitat along Coyote Creek, west of Hwy 101, as a County Park. The Coyote Creek Parkway meanders along Coyote Creek for 15 miles, of which about 7.5 miles are within Coyote Valley.

Calero County Park

Once part of the Pueblo lands of San Jose, and Rancho San Vicente land grant, this 3,476-acre park is nestled in the eastern foothills of the Santa Cruz Mountains. The park includes a reservoir.

Anderson County Park

The 3,109-acre Anderson Park also features the Coyote Creek Parkway multiple use trails, the Jackson Ranch historic park site, the Moses L. Rosendin Park, and the Burnett Park area. This unique combination of recreational resources makes Anderson Lake County Park a magnet for power boat enthusiasts, bicyclists, equestrians, picnickers, and nature lovers.

Santa Teresa County Park

Located in the Santa Teresa Hills ten miles south of downtown San Jose, this 1,627 acre park, rich in history, offers spectacular views from its trails above the Almaden and Santa Clara Valleys.

Metcalf Motorcycle County Park

This 459 acre park is located on Coyote Ridge east of Coyote Valley. The park offers 20 miles of trails for ATVs riders.

North Tulare Hill

The Department recently purchased 141 acres on the north side of Tulare Hill.

Santa Clara County Water District

The Water District owns and manages Ogier Ponds adjacent to Coyote Creek. It also owns, and is planning to restore wetland habitat on, a 74-acre area encompassing Laguna Seca to act as an aquifer recharge facility and to mitigate the District's stream maintenance projects, which are important for flood protection.

Silicon Valley Land Conservancy

The Silicon Valley Land Conservancy currently owns and manages lands directly adjacent to Coyote Valley.

Coyote Ridge

Silicon Valley Land Conservancy (SVLC) currently owns and manages 95 acres on Coyote Ridge as mitigation for the Bay Checkerspot butterfly, the Santa Clara Valley *Dudleya* and other threatened or endangered species. Coyote Ridge parallels Hwy 101 between San Jose and Morgan Hill, east of Coyote Valley. It is one of the most diverse ecosystems in all of California and contains over 400 species of native plants and wildflowers. Coyote Ridge was dedicated to SVLC as mitigation for power plants built by Silicon Valley Power and Calpine (Metcalf Energy Center and Los Esteros Critical Energy Facility). Tule elk are frequently seen on the Ridge.

Tulare Hill

The Tulare Hill Ecological Preserve is 116 acres dedicated to the protection of the Bay Checkerspot butterfly, the California Red-legged frog, and other threatened and endangered species. It is located just north of Coyote Valley between Monterey Road and Santa Teresa Blvd. It was donated to SVLC by the Metcalf Energy Center as mitigation for their power plant on Monterey Road.

Fisher Creek

The Fisher Creek conservation easement is 9 acres set aside for riparian protection and enhancement as a result of construction of the Metcalf Energy Center (MEC) in 2003. It flows between Tulare Hill and the MEC power plant into Coyote Creek.

Natural Resources and Resource Management

Topography

Coyote Valley is a broad alluvial valley with some marshy areas mostly along the water courses. Located at the northern portion of the Santa Clara Valley, the valley is defined by the Diablo Range to the east and the Santa Cruz Mountains to the west. Three significant geological features characterize the valley. Tulare Hill, a slight geologic ridge near Cochrane Road, borders the valley to the north and separates the valley from suburban San Jose. Secondly, the Coyote Narrows, also in the northern portion of the valley, is a geologic formation located east of Tulare Hill where the Diablo Range and the Santa Cruz Mountains converge. This is the general location of the confluence of Fisher Creek and Coyote Creek. Finally, a little hill rising several hundred feet in elevation located near the intersection of Bailey Avenue and Saint Teresa Boulevard provides a unique prospect point across the valley floor.

Soils

Coyote Valley is dominated by soils characterized as Prime with several areas in the northern portion and south western portion designated as being of local significance for farmland. Soils along the northeastern edge are generally designated for grazing and are classified as loam or silt loam. The central portion of the valley is characterized by clay loam or silty clay loam and the south and southwest portion is characterized by clay loam. The area around Laguna Seca in the northwestern portion of the valley is dominated by Fine Sandy Loam, Gravelly Loam, Loam, or Gravelly Loam.

Climate and Rainfall

Coyote Valley is characterized by Mediterranean climate, with hot dry summers and relatively mild, wet winters. Daily average temperatures range from the mid 60's to the high 80's (°F) in spring and summer and from the mid 40's to mid 50's (°F) in the winter. The valley is designated as Zone 14 by the Sunset New Western Garden Book.¹² In the Coyote Valley, mean annual precipitation is 21 inches. Mean annual evapo-transpiration is 49 inches, making for an average annual moisture deficit of 28 inches. Most precipitation (90%) falls between November and March.¹³

Hydrology and Water Quality

This section describes the hydrology and water resources in the Coyote Valley. It addresses hydrologic features, water supply, water quality, and flood hazards. (See Hydrology map in appendix.)

Hydrologic Setting

Coyote Valley is part of the Coyote Creek Watershed, which is the largest watershed in Santa Clara County. Over 320 square miles of land area drains into San Francisco Bay via Coyote Creek and its tributaries. The Coyote Narrows at the northern portion of the valley controls the flow of water within Coyote Creek to the north towards San Francisco Bay. The dividing line between surface and groundwater that flows to the north and that which flows to the south through Morgan Hill and Gilroy (to the Pajaro River and Monterey Bay), is the slight geologic ridge near Cochrane Road. Water flows

¹² Coyote Valley Specific Plan Greenbelt Research, June 2005, p.6

¹³ Coyote Valley Specific Plan Greenbelt Research, June 2005, p.6

within the valley from the southeast at Cochrane Road towards the northwest to the Coyote Narrows, which corresponds to the general elevation of the valley (City of San Jose, 2006).¹⁴

Groundwater

The Santa Clara County Groundwater Basin is made up of three sub-basins: the Coyote Valley, Santa Clara Valley, and Llagas Sub-basins. The Coyote Valley basin is a tributary basin of the larger Santa Clara County Groundwater Basin and is hydraulically connected to the Santa Clara Valley basin at the Coyote Narrows. The sands, gravels, and finer-grained sediments that occur within the Valley were deposited primarily as alluvium by Coyote Creek. The alluvial deposits range in thickness from about 500 feet in the south to 150 feet in the north near the Coyote Narrows (Iwamura, 1995).¹⁵ Depth to groundwater is commonly less than 20 feet and ranges from about 75 feet in the south and less than five feet in the north near the Coyote Narrows. Groundwater levels in the basin are very responsive to the stimuli of natural (i.e., rainfall) and artificial recharge (recharge ponds, etc.) (City of San Jose, 2006).¹⁶

Groundwater Quality

Comparison of 2010 data against the agricultural objectives in the San Francisco Bay Regional Water Quality Control Board Basin Plan indicates relatively few instances where constituents were detected above objectives for wells located in the Coyote Valley except for nitrate (SCVWD, 2011).¹⁷ Table 10 shows agriculture-related constituents against Basin Plan objectives and Table 11 provides a summary of constituents detected above Basin Plan objectives.

¹⁴ City of San Jose, Coyote Valley Specific Plan, Draft Environmental Impact Report (DEIR), March 2007.

¹⁵ Iwamura, T. I. (1995). "Hydrogeology of the Santa Clara and Coyote valleys ground water basins, California". In E. S. Sangines, D. A. Anderson, and A. V. Busing. Recent Geologic Studies in the San Francisco Bay Area. Santa Barbara, CA: Pac. Sect., Soc. of Econ. Paleontol. and Mineral.

¹⁶ City of San Jose, Coyote Valley Specific Plan, Draft Environmental Impact Report (DEIR), March 2007.

¹⁷ Iwamura, T. I. (1995). "Hydrogeology of the Santa Clara and Coyote valleys ground water basins, California". In E. S. Sangines, D. A. Anderson, and A. V. Busing. Recent Geologic Studies in the San Francisco Bay Area. Santa Barbara, CA: Pac. Sect., Soc. of Econ. Paleontol. and Mineral.

Table 10: Agricultural-related Constituents and Basin Plan Objectives

Constituents	Units	Value
Aluminum	ug/l	5,000
Ammonium	mg/l	--
Arsenic	ug/l	100
Bicarbonate ¹	mg/l	--
Beryllium	ug/l	100
Boron	ug/l	500
Cadmium	ug/l	10
Chloride	mg/l	142
Chromium	ug/l	100
Cobalt	ug/l	50
Copper	ug/l	200
Specific Conductance (Salinity)	uS/cm	200 – 3,000 ²
Specific Conductance (Permeability)	uS/cm	--
Fluoride	ug/l	1000
Iron	ug/l	5000
Lead	ug/l	5000
Lithium	ug/l	--
Manganese	ug/l	200
Molybdenum	ug/l	10
Nickel	ug/l	200
Nitrate + Nitrite as N ³	mg/l	5
Nitrate as N	mg/l	--
Selenium	ug/l	--
Sodium Adsorption Ratio (adj.)	--	3
Vanadium	ug/l	100
Zinc	ug/l	2,000
pH	--	5.5 – 8.3
Notes: 1. The bicarbonate objective applies only to irrigation with overhead sprinklers. 2. This represents the ideal range for irrigation water to be protective of both salinity and permeability hazards. 3. The limit of 5 mg/L as N is equivalent to 22.5 mg/L Nitrate as NO ₃ if nitrite is not present.		

Source: SCVWD, 2011

Table 11: Summary of Constituents Detected Above Agricultural Objectives

Constituents	Number of Wells Analyzed	Number of Wells Greater Than Objective	Value		
			Min	Med	Max
Chloride (mg/l)	17	1	13	44.5	154
Iron (ug/l)	17	1	<20	<100	5,600
Nitrate + Nitrite as N (mg/l)	22	8	<0.05	9.3	51.3
Nitrate as N (mg/l)	8	1	0.47	0.71	5.6
Sodium Adsorption Ratio (adj.)	17	1	0.57	0.77	3.43

Source: SCVWD, 2011

Nitrate in the environment comes from both natural and anthropogenic sources, such as synthetic fertilizers, septic systems, and animal waste. Land use over the Coyote Valley is mixed; the northern portion is predominantly agricultural and the southern portion contains both agricultural use and suburban-style residential development. No municipal wastewater collection system exists in much of Coyote Valley, therefore septic systems are common (SCVWD 2011). The drinking water MCL for nitrate is 45 mg/L. Because the Santa Clara Valley has a long history of agricultural production and septic systems are still in use in the unincorporated areas of the county, nitrate is an ongoing groundwater protection challenge in this valley (SCVWD 2011).

Groundwater Drainage Patterns

Before the modifications of the 19th and 20th centuries, the lands along Coyote Creek were comprised of well-drained alluvial fans and natural levees (SFEI, 2006).¹⁸ Many creeks used to spread broadly over the unconfined zone of the basin, supporting a highly discontinuous natural drainage network. This network was conducive to natural groundwater recharge along the coarse alluvial fans. These areas within the Valley became the most productive agricultural lands, primarily fruit orchards. Lower-lying basin areas in the northern part of the Valley with clayey soils supported mosaics of wetland habitats. These areas were difficult to farm and have been developed more slowly over the years.

Currently, nearly 50 percent of the valley floor water courses draining into Coyote Creek are constructed channels. These channels convey runoff across natural recharge areas that previously had no surface drainage, thereby reducing natural percolation and groundwater recharge. Although these channels move water efficiently across the valley floor to prevent flooding within the valley, they tend to increase flood peaks downstream (SFEI, 2006).

Permeability throughout Coyote Valley is not uniform, and certain locations provide more natural groundwater recharge than others. For example, the bed of Coyote Creek is extremely permeable while the clay deposits of northern Coyote Valley have low infiltration rates. No significant laterally extensive clay layers exist in the Coyote Valley Basin. However, perched groundwater occurs in the northwest end of the basin as a result of shallow, discontinuous clay deposits with low permeability. Therefore, most of the natural groundwater recharge to the west of Coyote Creek probably occurs within the valley floor south of Bailey Avenue (City of San Jose, 2006).

The rest of the valley floor is made up largely of permeable materials that allow for the free recharge of surface waters (resulting from direct runoff during storms) into the deeper water bearing layers (City of San Jose, 2006). These fill materials include alluvial fans, older and younger alluvium, basin deposits, and stream deposits.

Local Groundwater Use

Discharge from the basin includes groundwater pumping, evapo-transpiration, surface water outflow, and groundwater outflow to the Santa Clara Valley Basin. Groundwater pumping is by major water

¹⁸ Grossinger, RM, RA Askevold, CJ Striplen, E Brewster, S Pearce, KN Larned, LJ McKee, and JN Collins, 2006. Coyote Creek Watershed Historical Ecology Study: Historical Condition, Landscape Change, and Restoration Potential in the Eastern Santa Clara Valley, California. Prepared for the Santa Clara Valley Water District. A Report of SFEI's Historical Ecology, Watersheds, and Wetlands Science Programs, SFEI Publication 426, San Francisco Estuary Institute, Oakland, CA.

retailers, private well owners, and agricultural users.¹⁹ The relatively recent installation and operation of several large retailer wells has resulted in a significant increase in groundwater pumping over the past several years (Todd Engineers and Kennedy/Jenks Consultants, 2010).²⁰ Table 12 shows historical groundwater pumping in the valley from 2000 to 2009.

Table 12: Historical Groundwater Pumping, Year 2000 to 2009

Year	Pumping Amount (AFY)
2000	7,900
2001	6,900
2002	6,700
2003	6,800
2004	7,300
2005	7,000
2006	10,900
2007	11,400
2008	13,200
2009	13,500

Source: SCVWD, 2010

SCVWD estimates the operational storage capacity of the Coyote Valley to be between 23,000 and 33,000 acre-feet, representing the volume of usable groundwater that the basin is capable of storing at full capacity (SCVWD, 2010).²¹ For water supply planning purposes, SCVWD assumes that recharge of the Basin can only take place up to the maximum operational storage capacity and, supplies to meet demands are unavailable once the operational storage is depleted. The actual amount of water that can be pumped is highly dependent on how the Basin is managed, recent hydrology, and the amount of natural and artificial recharge that takes place (SCVWD, 2010).

The majority of basin recharge (85 percent) is from surface waters flowing in Coyote Creek. Groundwater levels in Coyote Valley are very responsive to the stimuli of rainfall and artificial recharge (i.e., the release of water from Anderson Reservoir into Coyote Creek for the purposes of groundwater infiltration). The remaining 15 percent of natural recharge is from the percolation of irrigation water, septic sewage, and direct precipitation (City of San Jose, 2006).

Surface Water

Coyote Valley is drained to the north by two tributaries to San Francisco Bay – Coyote Creek and Fisher Creek. The construction of the Southern Pacific Railroad through the center of Coyote Valley now acts as a levee between Coyote and Fisher Creeks.

¹⁹ Coyote are Valley is located within the boundary of the Santa Clara Valley Water District (SCVWD) and is supplied locally on a retail basis by the San Jose Municipal Water System (San Jose MUNI) and Great Oaks Water Company. Note that SCVWD does not currently operate groundwater wells and is not able to directly substitute groundwater for surface water due to a lack of District-owned water supply wells and related infrastructure (SCVWD, 2010).

²⁰ Revised Final Groundwater Vulnerability Study, October 2010

²¹ Operational groundwater storage capacity is an estimate of the storage capacity based on SCVWD operations. Operational storage capacity is generally less than total storage capacity. It must account for available pumping capacity, avoidance of land subsidence, and problems associated with high groundwater levels.

Coyote Creek

Coyote Creek flows most of the length of the Coyote Valley Basin along its eastern side. Coyote Creek is downstream of and benefits from controlled releases from the Anderson and Coyote reservoirs, which are located east of the Valley in the Diablo Range and have a combined storage capacity of 115,00 acre-feet. Coyote Creek is a losing stream throughout the year, whereby surface water percolates through the stream bed and recharges the groundwater basin. The main tributaries of Coyote Creek are Lower Penitencia Creek, Upper Penitencia Creek, Silver Creek, and Fisher Creek.

Historically, Coyote Creek meandered throughout the Coyote Valley. In its present form, the creek is able to contain the majority of its discharge, even under estimated 100-year (one percent) flooding conditions. By comparing creek cross-sections taken under existing conditions to those taken in the late 1970s, it appears that the creek has shifted somewhat and may have even enlarged itself during flood events in intervening years (City of San Jose, 2006).

Coyote Creek enters the Coyote Valley from the southeast at Anderson Reservoir. The creek crosses US 101 and meanders northward past Coyote Creek Golf Course to the Coyote Narrows. Several percolation ponds, operated by the SCVWD, are located along Coyote Creek to recharge the groundwater basin. Abandoned quarry ponds, which are also used for groundwater recharge, are located along the creek. Toward the northwest end of the valley, discontinuous basin deposits of clay tend to keep ponds, including the Metcalf Percolation Ponds and other low areas filled with perched groundwater, above the main saturated aquifer (City of San Jose, 2006).

Coyote Canal

Coyote Canal is an earthen channel that diverts flows from Coyote Creek two miles downstream of Anderson Dam and reenters Coyote Creek near Metcalf Road. The Coyote Canal is located to the east of Coyote Creek and parallels US 101. This facility was built to help manage water resources in the valley, and in particular to convey water around Coyote Creek's recharge area between US 101 and Coyote Creek Golf Course. By diverting water from the recharge area during storm events or discharges from Anderson Reservoir, high groundwater levels in Coyote Valley were minimized. Historically, the canal also provided a way to prevent the loss of water supplies upstream of the Metcalf Percolation Ponds and the aquifer it recharges. The canal is not currently being used by the SCVWD for these purposes because of safety and maintenance concerns (City of San Jose, 2006).

Fisher Creek

Fisher Creek, which is primarily managed for flood control, flows north along the western portion of the Coyote Valley Basin. Fisher Creek is a variably gaining and losing stream. During conditions of high groundwater, Fisher Creek receives groundwater discharge from much of the Coyote Valley floor. Fisher Creek joins Coyote Creek near Coyote Narrows, where it exits the Coyote Valley Basin (Fostersmith, et al., 2005).²²

²² Fostersmith, E., L. Jaimes, and B. Judd, January 2005, Santa Clara Valley Water District (SCVWD), *Groundwater Conditions 2002/2003*.

Historically, Fisher Creek is believed to have been located along the base of the Santa Cruz Mountains, terminating at Laguna Seca (“small dry lake”). In 1916, the creek was realigned as part of a project designed to improve flood control and drainage in northern Coyote Valley. In about 1963, the creek was reconstructed as an approximately 30- to 50-foot wide, seven foot deep manmade earthen channel, generally privately-owned and maintained for agricultural and hillside drainage. The channel reach from Monterey Road upstream to Bailey Avenue was constructed as a reclamation ditch to drain the low-lying areas in Laguna Seca. North of Bailey Avenue the channel has capacity for approximately the ten-year flood; south of Bailey Avenue existing channel capacity is for the five-year flood or less. Fisher Creek, south of Palm Avenue, is generally dry in the summer months. North of Palm Avenue, the creek is fed by perched groundwater and is generally wet in the summer months (City of San Jose, 2006).

Coyote and Anderson Reservoirs

Coyote and Anderson reservoirs are operated by the SCVWD. Stream flow in Coyote Creek, which can be used to recharge the Coyote Valley Basin, can be regulated by Coyote and Anderson reservoirs. Secondly, they serve functions of water supply, flood control, and recreation and wildlife habitat.

Flooding Conditions

As explained above, the dramatic increase in constructed drainage in the Valley has contributed to decreasing groundwater recharge, while increasing flood peaks downstream. In addition, historically high groundwater levels and discontinuous clay deposits in the northern portion of the Valley contribute to flooding along both Coyote Creek and Fisher Creek. Perched groundwater in the northern end of the Valley tends to impact low-lying areas, including Laguna Seca, which is subject to winter inundation when the Fisher Creek channel overflows.²³ The flooding typically remains during wet winters when the groundwater table is especially high. Water sits atop the clay deposits and cannot easily flow back to Fisher Creek and out of the Valley. Furthermore, the Union Pacific Railroad tracks and a concrete median barrier along Monterey Road tend to force flood waters from Coyote Creek to the north, rather than allow them to continue naturally toward the west to Fisher Creek (City of San Jose, 2006).

Wildlife Habitat

The Coyote Valley is rich in both agricultural and environmental resources and Santa Clara County has a long tradition of conservation. As far back as 1960, in the heyday of post-war development, the County’s General Plan stated major goals as conservation of resources and livable environment. The County’s first Conservation Plan was prepared and adopted in 1973 subsequent to the passage of the Environmental Quality Act in 1970. That Conservation Plan inventoried the entire county’s varied natural resources, including air, water, mineral, historical and cultural, as well as agricultural, vegetative and wildlife.

The most current source of data on vegetative and wildlife resources is the County’s Habitat Conservation Plan (HCP). Over the last few years, the HCP program has prepared a set of maps that

²³ City of San Jose, Coyote Valley Water Supply Assessment, January 2007.

identify the location of the habitat for 21 protected species –flora and fauna within the southern portion of the County.

This section will identify the protected wildlife and vegetative species that exist in Coyote Valley, describe the method used for mapping these protected species and discuss locations in the Valley where they are most likely to be found.

Not all wildlife and vegetative resources are identified and mapped by the HCP. This section will also discuss the research conducted by the Environmental Studies Program at DeAnza College documenting a broader range of wildlife species that have been observed in the Valley and identifying possible corridors through the Valley where they are able to move from one side to another.

The HCP/NCCP

The Santa Clara Valley Habitat Conservation Plan/ Natural Community Conservation Plan (HCP/NCCP) is being prepared by the County of Santa Clara and its five local partners (Santa Clara Valley Transportation Authority; Santa Clara Valley Water District, and the Cities of Gilroy, Morgan Hill and San Jose). The purpose of the plan is to “protect and enhance ecological diversity and function in the greater portion of Santa Clara County, while allowing appropriate and compatible growth and development in accordance with applicable laws.”²⁴ The Plan is both a habitat conservation plan intended to fulfill the requirements of the Endangered Species Act and a natural community conservation plan (NCCP) to fulfill the requirements of the California Natural Community Conservation Planning Act. The Plan not only addresses impact mitigation, but will also contribute to the recovery and delisting of listed species and help preclude the need to list additional species in the future.

The HCP/NCCP addresses 21 listed and non-listed species, 11 wildlife species and 10 plant species. The Plan includes conservation measures to protect all 21 covered species, whether or not they are currently listed. Of these 21 species, habitats for 10 are present in Coyote Valley. These 10 are listed in the table below.

²⁴ Santa Clara Valley Habitat Plan, December 2010, p.1-3

Table 13: Protected Species Present in Coyote Valley

Species	Scientific Name
Amphibians and Reptiles	
California tiger salamander	<i>Ambystoma californiense</i>
California red-legged frog	<i>Rana aurora draytoni</i>
Foothill yellow-legged frog	<i>Rana boylei</i>
Western pond turtle	<i>Clemmys marmorata</i>
Birds	
Golden eagle	<i>Aquila chrysaetos</i>
Western burrowing owl	<i>Athene cunicularia hypugea</i>
Least Bell's vireo	<i>Vireo bellii pusillus</i>
Tricolored blackbird	<i>Agelaius tricolor</i>
Plants	
Mount Hamilton thistle	<i>Cirsium fontinale</i> var. <i>campylon</i>
Most beautiful jewelflower	<i>Streptanthus albidus</i> ssp. <i>Peramoenus</i>

Source: Santa Clara Valley Habitat Conservation Plan, December 2010, Table 1-2.

Mapping the Listed and Unlisted Species

The maps of covered species habitat are based on data collected on land cover types and models developed to map the likelihood of species habitat based on land cover types. Of the 21 species covered by The Plan, only 18 are mapped based on these models due to the unavailability of enough data to create models for four of the species. These four are Townsend's Big-eared bat, Tiburon Indian Paintbrush, Coyote Ceanothus and Santa Clara Valley Dudleya. The models estimate the extent and location of key habitat characteristics of each species. The models are spatially-explicit, GIS-based "expert opinion models" based on identification of land cover types that provide important habitat for these species.

Land cover types

A land cover type is defined as the dominant character of the land surface discernible from aerial photographs, as determined by vegetation, water, or human uses. Data on land cover types were obtained from multiple sources, including aerial photography, National Wetlands Inventory Maps from the USFWS, Coyote Valley specific plan, U.S. Soil Conservation Service, Midpeninsula Regional Open Space District, County Parks and Recreation Dept., San Francisco Public Utilities District and project Environmental Impact Reports.

Coyote Valley Covered Species

The HCP maps indicate the location and extent of covered species habitat within the Coyote Valley. In general, mapped habitat areas are very limited in Coyote Valley. This is partially the result of lack access to privately-held lands and the extent of cultivation of agricultural lands, which, over time, would prevent the establishment of habitat areas.

Plants

Given the limited access to Coyote Valley lands, the only covered plant species mapped in the Coyote Valley are Big Scale Balsamroot, Robust Monardella, Mt. Hamilton Thistle and Most Beautiful

Jewelflower. These species are located primarily on public lands owned by the City of San Jose, the County or the Water District. (See Habitat: Plants map in appendix.)

Amphibians

Habitat for amphibians can be found primarily along stream channels, riparian corridors and creeks. For instance, the California Red-legged frog is primarily located within Coyote Creek and Fisher Creek. The Foothill Yellow-legged frog is found more upstream in smaller, more seasonal creeks. The Western pond turtle can be found in all waterways and the California Tiger salamander is primarily located in the ponds adjacent to Coyote Creek. (See Habitat: Amphibians map in appendix.)

Birds

There are three birds whose habitat has been mapped by the HCP. These include the Golden Eagle, whose nests are located at higher elevations in and around Coyote Valley; the Tri-colored blackbird whose nests are primarily located along riparian corridors; and the Western burrowing owl whose overwintering areas (not nests) are found throughout Coyote Valley. (See Habitat: Birds and Mammals map in appendix.)

Tracking Wildlife in Coyote Valley

In 2007, the Environmental Studies Department at DeAnza College, located in Cupertino, launched the Coyote Valley Wildlife Corridor Program to track and monitor sightings of birds and mammals that traverse Coyote Valley. DeAnza students, under the supervision of Environmental Studies staff, have been trained to record wildlife movement in the Valley. As of 2008, CVWCP has observed 166 species of birds and 24 mammal species.

The Habitat Conservation Plan for the Santa Clara Valley addresses 21 species of flora and fauna because these are the species protected by the USFWS and CA Fish and Game. However, the Coyote Valley is habitat to a plethora of mammals and birds not protected by these agencies, but nevertheless contribute to the rich biodiversity of the Santa Clara Valley. Research conducted by the CVWCP and DeAnza students has identified five “wildlife hot spots” or concentrations of sighting of mammals and birds. Lack of access to private lands has limited the concentrations of mammal observations primarily to public rights-of-way and parks and other public lands near Highway 101. The three concentrations of mammal sightings are primarily observed where there are culverts along Highway 101. There are two areas where there has been a concentration of observations of bird nests. One of these is located in the western part of Coyote Valley north and south of Bailey Road. The other area is on the eastern side of Coyote Valley just south of the Coyote Creek golf course. (See Wildlife Linkage Zones and Hotspots map in appendix.)

Wildlife Linkages

The goal of the CVWCP is to work with appropriate local agencies to establish linkage zones where mammals could safely cross the Coyote Valley, therefore reducing the number of mammals killed on local roadways. Coyote Valley is one of only two connectivity points between the Diablo Range and the Santa Cruz Mountains. Connectivity between habitat patches is critical to maintain genetic viability and maintain viable populations of wildlife. While there are many opportunities for wildlife to cross Highway

101, either through one of its 27 culverts or via overpasses and underpasses, there are limited places where wildlife can cross Monterey Highway or the Amtrak rail line. These crossing points are limited to a few intersections including Bailey Avenue, Laguna Avenue and Palm Avenue. (See Wildlife Linkages map in appendix.)

LAND VALUES IN COYOTE VALLEY

The economic feasibility of agriculture in Coyote Valley depends on the cost of the land relative to its productivity and the revenue that farming could generate. Limited sales in the Valley over the last several years make determining land values very challenging. To do this, we have looked at several sources of information:

- Recent sales
- Assessed values
- Historical land values in adjoining counties
- Trends in the commercial and industrial space market
- Population growth
- Social and lifestyle factors

Recent Sales

The most reliable means of determining land values is to gather recent sales prices for similar properties in close proximity to the subject parcel(s). However, as stated earlier, the number of land sales in Coyote Valley has been limited to a handful of sales in the South Valley. In addition, there have been three or four sales of large parcels in North and Mid-Coyote Valley. Based on an analysis of the limited number of sales, land values range, on a per-acre basis, from \$10,000 to \$372,000 per acre.²⁵ In general, the earlier land sales commanded higher values per acre and the more recent land sales indicate lower values per acre.

These values reflect the fact that in South Valley, many of the parcels are improved with residential or commercial buildings. They also reflect the rampant speculation resulting from Cisco's 1999 announcement that they wished to build a new 6.6 million square-foot headquarters in Coyote Valley and the resultant planning for development in the North Valley.²⁶ Land values for farmland in the Coyote Valley were driven up by the global success of the Silicon Valley economy, the start-up and expansion of new tech companies and the steady influx of new workers. By fall of 2001, however, Cisco, having lost nearly 80% of its stock value and laying off thousands of workers, announced it was pulling out of the Coyote Valley project. Yet, planning for a large-scale industrial campus development continued on the part of developers and the City of San Jose. The heyday of the dot-com bubble was long over and another recession was about to hit. By 2006, the interest in development in the North Coyote Valley had faded and the developers stopped providing funding for the preparation of a Specific Plan and EIR to guide development in the North Valley. The Specific Plan was never adopted. (See Land and Improvement Values map in appendix.)

²⁵ This represents a transaction in which Gavilan College acquired a 55-acre parcel in 2008 using parcel tax bond proceeds with the intent of developing a 10,000-student campus. The price per acre is a clear outlier relative to other Coyote Valley sales in the 2004-2011 time frame.

²⁶ "Coyote Campus Fact Sheet, 8/1/99"

Table 14: Recent Land Sales in Coyote Valley

Parcel	Year of Sale	Sales Price	Acres	Average Price per Acre
1	2004	\$722,000	3.34	\$216,168
2	2007	\$675,000	4.97	\$135,815
3	2010	\$540,000	7.42	\$72,776
4	2004	\$1,200,000	9.7	\$123,711
5	2005	\$1,100,000	9.74	\$112,936
6 ²⁷	2007	\$1,450,000	10	\$145,000
7	2004	\$240,000	15.7	\$15,287
8	2005	\$1,680,000	16.81	\$99,941
9 ²⁸	2008	\$18,000,000	55	\$327,272
10	2011	\$3,708,000	100	\$37,000
11	2009	\$1,900,000	141	\$13,475
12	2010	\$3,500,000	350	\$10,000

Source: Data from Loopnet; Analysis by SAGE

Assessed Values

While assessed values often do not reflect market value due to the limits that Proposition 13 placed on increases in assessed valuation, they do provide an informative and useful benchmark. The following table summarizes data from the Santa Clara County Assessor's Office for all parcels within Coyote Valley. In general, the smaller the parcel, the higher the value per acre. Sixty-nine percent of the parcels, (422 of the 606 with data available), and 52 percent of the acreage (2,817 acres of the total 5,351) has per-acre values greater than \$50,000. Only 131 parcels covering 1,845 acres have an assessed value of less than \$30,000.

Table 15: Assessed Values for Land and Improvements, Per Acre, Coyote Valley, 2011

Value Range, per Acre	Acreage in Value Range	Parcels in Value Range
\$100,000 +	1,272	293
\$50,000 – 99,999	1,545	129
\$30,000 – 49,999	689	53
\$15,000 – 29,999	637	65
\$0 – 14,999	1,208	66
Total Acreage and Parcels	5,351	606
Note: This is for Land and Improvements		

Source: Santa Clara County Assessors Office, 2011

²⁷ More recent data from the Santa Clara County Assessor's office indicates that there was a subsequent transfer of the property, in September 2010, with the current assessed value suggesting that the market value at the time of the more recent transfer was approximately equal to the 2007 sale price.

²⁸ See footnote 24, above.

In the table below, assessed values are for the land only, even when the parcel has improvements on it. The majority of the parcels, 53 percent, have land values greater than \$50,000. About 36 percent of the parcels have land values below \$30,000.

Table 16: Assessed Values, Land Only, Per Acre, Coyote Valley, 2011

Value Range, per Acre	Acreage in Value Range	Parcels in Value Range
\$100,000 +	771	177
\$50,000 – 99,999	1,392	144
\$30,000 – 49,999	655	66
\$15,000 – 29,999	843	100
\$0 – 14,999	1,690	119
Total Acreage and Parcels	5,351	606
Note: This is for Land only		

Source: Santa Clara County Assessors Office, 2011

Agricultural Land Values in Adjoining Counties

The California Chapter of the American Society of Farm Managers and Rural Appraisers (ASFMRA) prepares an annual review of agricultural land and lease values for almost every county in California. Heavily urbanized counties, such as those in the Bay Area and Los Angeles are not included in this review, because values for farmland are impacted so greatly by the demand for housing. The dominant type of agriculture in Santa Clara County is production of row crops, such as leaf lettuce and other vegetables. The adjoining counties of San Benito, Santa Cruz and Monterey are similar in the dominance of row crops in their agricultural portfolio. A review of farmland values and lease rates in these counties could be instructive in determining a baseline for farmland values in Coyote Valley. In 2010, land values in these counties ranged from a low of \$11,000 to a high of \$55,000 per acre, depending on the location and productivity of the land. Since 2006, prior to the beginning of the last recession, higher-priced land fell in value by \$10,000 to \$15,000 per acre while land at the lower end of the range remained fairly constant (except in Santa Cruz where an increased demand for land suitable for strawberry production propped those prices up). Values for parcels at the higher end of the scale stayed fairly constant between 2006 and 2010 reflecting the strength of the fresh lettuce and vegetable market.

Table 17: Historical Land Values for Farmland Planted in Row Crops By County, per Acre

Year	San Benito	Santa Cruz	Monterey
2010	\$11,000 – 26,000	\$20,000 – 40,000	\$15,000 – 55,000
2009	\$11,000 – 30,000	\$15,000 – 45,000	\$14,000 – 45,000
2008	\$11,000 – 32,000	\$15,000 – 50,000	\$20,000 – 50,000
2007	\$11,000 – 42,000	\$15,000 – 50,000	\$15,000 – 50,000
2006	\$11,000 – 42,000	\$12,000 – 50,000	\$12,000 – 55,000

Source: Trends in Agricultural Land and Lease Values, CalASFMRA, 2011

Lease values for all three counties range from a low of \$400 per acre to a high of \$2,400 per acre.

Table 18: 2010 Lease Values for Farmland Planted in Row Crops By County, per Acre

San Benito	Santa Cruz	Monterey
\$400 - \$1000	\$1,200 - \$2,200	\$750 - \$2,400

Source: Trends in Agricultural Land and Lease Values, CalASFMRA, 2011

Demand for New Commercial and Industrial Space

In short, real estate lease rates and vacancies follow broader economic trends. In the last decade, there have been two unprecedented economic cycles that have affected commercial lease and vacancy rates. For instance, in 2000, at the peak of the dot.com bubble, average monthly lease rates for office space in Santa Clara County rose to a previously un-imaginable \$8.25 per square foot. At the same time, vacancy rates were at an all-time low of 1%. The swift rise in rents between 1998 and 2000 triggered new development projects that significantly increased commercial and industrial space throughout the county. The dot.com bust, which occurred in December, 2000 resulted in rents dropping precipitously and reaching a low of just under \$3.00 per square-foot for office space by 2003. Vacancy rates followed suit and went up to a high of 20% in 2003.²⁹

The 4th quarter of 2008 was the start of the Great Recession, the second significant economic cycle in the decade. Prior to this, office vacancy rates had gradually declined to under 10% and lease rates were back up to \$5.50. The unprecedented lease and vacancy rates seen during the dot.com bubble were not to be seen again.

As a result of the recession and global economic restructuring, Santa Clara County lease rates fell to a new low of just under \$1.00 by 2010, with vacancy rates back up to their post-dot-com crash rates of 20%. These two economic cycles resulted in the lowest levels of commercial and industrial development seen in Santa Clara County in several decades. This drop in demand for new industrial and commercial space has dramatically lowered the demand for raw land, including land in the Coyote Valley.

In 2011, the unemployment rate remained at 10%, vacancy rates remain above 15% and lease rates remain low, at a little above \$2.00.³⁰ At the same time, certain sectors of the Silicon Valley economy are growing and creating demand for office space. For example, a February 9, 2012 article in the San Jose Mercury News reported that the South Bay added 26,000 new employees in 2011 and that if all known real estate development projects are completed, this would add 2.3 million square feet of space with room for 9,200 employees. The article suggests that as available space fills up on the Peninsula and in Sunnyvale, Cupertino, and Santa Clara, demand could in turn increase in San Jose.³¹ While much of the market focus in San Jose is in the northern part of the City, long-term expansion of the regional economy could eventually place development pressure on Coyote Valley again.

Despite the current signs of increasing demand for office space in Silicon Valley, several factors point to limited greenfield development over the next decade or two, which would tend dampen demand for office space in a location like Coyote Valley. First, much research has found that the new generation of tech workers would rather live in an urban environment and bike to work or take transit, rather than live in a typical suburban subdivision, and locations that are more centralized will be attractive to high tech employers in particular, who feel the need to compete regionally for access to the most talented

²⁹ Index of Silicon Valley 2011, p. 56 Joint Venture: Silicon Valley, January 2011

³⁰ Grubb & Ellis Office Trends Report—Third Quarter 2011, Silicon Valley, November 2011

³¹ Avalos, George. South Bay Commercial Real Estate Market Heats Up. [San Jose Mercury News.com](http://SanJoseMercuryNews.com), February 9, 2012.

workers. Second, the improvement in transit access throughout the Valley, with the extension of light rail, and the future extension of BART into Santa Clara County, makes properties in North Santa Clara County, especially North San Jose and Milpitas, much more attractive to growing firms. Third, the cost of extending public services, including water and wastewater treatment, into undeveloped areas and the cost of required environmental mitigations can be more costly than in-fill development.

Economic and Population Growth

The most significant drivers of greenfield development are economic growth (jobs) and population growth. While population continued to grow at a steady rate of just under 1 percent per year, jobs have not kept pace. Between 2008 and 2009, at the front end of the last recession, Santa Clara County lost seven percent of its job base. The total number of jobs still has not reached even the 2006 level and has a long way to go to reach the 1.1 million jobs in 1999.

Table 19: Population and Job Growth in Santa Clara County

	Population (1,000s)	Annual Change	Employment (1,000s)	Annual Change
2011	1805	1%		
2010	1787	1%	843	0%
2009	1774	1%	847	-7%
2008	1759	1%	905	1%
2007	1736	1%	900	2%
2006	1713		880	

Source: California Dept. of Finance; California Employment Development Dept.

Social and Lifestyle Factors

Until 1999, it seemed as though the development of raw land (greenfields) would be endless and that the demand for more and more commercial and residential building space was insatiable. Since then, many trends have taken hold that moderate that drive towards greenfield development.

Greater awareness of the environmental as well as the fiscal impacts of greenfield development has convinced land planners and policy makers to incentivize in-fill development, which has led to a leveling of the cost differences between infill development or redevelopment and greenfield development. At the same time, as stated earlier, the new generation of tech workers and the creative class has strongly indicated a preference for living in more lively urban areas and would rather bike to work or take transit or not commute at all. Developers are responding by building more housing in existing urban areas thereby reducing demand on lands located in suburban area. This trend has played out up and down the West Coast from Seattle to San Diego.

The increasing desire to buy local and to eat organically or sustainably produced foods has had a positive impact of farmland values, especially for lands located within metropolitan areas. While the previous factors work to lower land values from the speculation-driven levels of the late 1990s, the demand for farmland close to metropolitan areas, such as Silicon Valley, in order to supply the growing number of farmers markets and restaurants serving locally produced foods could help to bolster the value of land used for agriculture near population centers over the next decade or so.

Resources Available for Ag Land Preservation

There are multiple public and private sources of funds from national and local organizations that could provide assistance in acquiring conservation easements or ownership of agricultural and environmentally significant lands in the Coyote Valley.

Federal Programs

This preliminary analysis investigates the availability of programs through the United States Department of Agriculture (USDA) for which the Coyote Valley project is likely eligible. Following are outlines of the program parameters for several USDA programs.³² Some of these federal programs are administered through California's Natural Resource Conservation Service (NRCS).

Beginning and Socially Disadvantaged Farmer Contract Land Sales

- Objectives: Provide federal loan guarantees to retiring farmers who self-finance the sale of their land to beginning of socially disadvantaged farmers and ranchers.
- Eligibility: The buyer of the farm and ranch must be a beginning or socially disadvantaged farmer or rancher.
- Amount of Funding Available: Covers contract sales of farms and ranches with purchase price or appraised value up to \$500,000.

Beginning Farmer and Rancher Development Program (BFRDP)

- Objectives: Fund education, extension, outreach and technical assistance initiatives directed at helping beginning farmers and ranchers.
- Eligibility: Collaborative state, tribal, local, or regionally-based networks or partnerships of public and private groups.
- Amount of Funding Available: Grants available up to \$250,000 and a match of at least 25 percent is necessary.

Certified Development Company Program (504 CDC under SBA)

- Objectives: Stimulate job creation through expansion or renovation of existing small business infrastructure.
- Eligibility: For-profit corporation, partnership, or proprietorship with net worth that does not exceed \$8.5 million and average net profit after taxes does not exceed \$3 million.
- Amount of Funding Available: Typical projects range from \$500,000 to \$2 million with average project totaling \$1 million.

Community Food Projects

- Objectives: Support local food production and its distribution throughout the community especially to low-income people.

³² Funding source summaries derived from *Building Sustainable Places Guide, October 2009*

- Eligibility: Private non-profits, and entities working in partnership with non-profits.
- Amount of Funding Available: Grants ranging in size from \$10,000 to \$250,000 and a match or at least 50 percent is necessary.

Conservation Innovation Grant Program (CIG)

- Objective: Support innovative agriculture conservation projects.
- Eligibility: National Component emphasizes large scale projects ranging in scale from watershed, to regional, to multi-state. State Component funds individual producers and small organizations.
- Amount of Funding Available: Funding varies; grants available for up to 50 percent of total project cost. There are exceptions for historically underserved groups to receive additional funding.

Conservation Stewardship Program (CSP)

- Objective: Actively maintain existing conservation systems and implement conservation activities on land in agricultural production.
- Eligibility: Private agricultural land is eligible to be enrolled if not enrolled in Conservation Reserve, Wetland Reserve or Grassland Reserve Programs. Land must be in production for past four of six years. Applicant must enroll all acres that they operate. Five year contract.
- Amount of Funding Available: Payments capped at \$40,000 per year. Payment average \$18 per acre nationwide.

Environmental Quality Incentives Program (EQIP)

- Objective: Provide technical, financial, and educational assistance to farmers and ranchers to promote natural resource conservation.
- Eligibility: Persons engaged in agricultural, forestry, and livestock production or owners of such land.
- Amount of Funding Available: Grants available for up to 75 percent (up to 90 percent for socially disadvantaged producers, limited resource producers, and beginning farmers and ranchers) of project costs not to exceed \$300,000 in payments and \$450,000 in payments for projects determined as having special environmental significance.

Farm and Ranch Lands Protection Program (FRPP)

- Objective: Protect farm and ranch lands from conversion to nonagricultural uses.
- Eligibility: Privately owned land feasible for agriculture production that is part of a pending offer from eligible State, Tribal, or local governmental or nongovernmental organization that demonstrates commitment to long-term conservation or agriculture or ranch lands through use of voluntary conservation easements.
- Amount of Funding Available: \$743 million authorized from 2008 to 2012. Eligible entities must provide 50 percent match of estimated fair market value.

Local Food Enterprise Loans

- Objective: Renew local food system infrastructure and community development.

- Eligibility: Individuals, cooperatives, cooperative organizations, businesses and other entities that distribute, aggregate, store and market foods produced in-state or within 400 miles from product origin.
- Amount of Funding Available: Loans are generally capped at \$10 million. Maximum loan guarantee is 80 percent for loans less than \$5 million, 70 percent for loans between \$5 and \$10 million, and 60 percent for loans exceeding \$10 million.

Organic Certification Cost Share (NOCCSP)

- Objective: Support organic certification for producers and handlers of organic products.
- Eligibility: Producers and handlers certified by USDA accredited certifying agent under the National Organic Program.
- Amount of Funding Available: Up to 75 percent of annual certification costs with maximum payment of \$750 per year.

Resource Conservation and Development (RC&D)

- Objective: Accelerate the conservation, development, and use of natural resources while improving the general level of economic activity and standard of living in communities.
- Eligibility: Councils with representation from state and local governments, Tribes, and nonprofit organizations.

Risk Management Education Program (RME)

- Objective: Provide farmers with knowledge, skills and tools needed to make informed risk management decisions for their operations with the goals of enhancing farm profitability.
- Eligibility: Private and public groups, organizations and institutions, and other qualified public and provide entities with demonstrated capacity to develop and deliver educational programs for agricultural producers.
- Amount of Funding Available: Awards range from \$5,000 to \$50,000

Risk Management Partnership Agreements (RMA)

- Objective: Research and development, education, and community outreach for non-insurance agricultural risk management tools.
- Eligibility: Individuals are ineligible to apply. Eligibility requirement vary for each of the three partnership categories (Product Management, Education, Outreach).
- Amount of Funding Available: No maximum and no minimum funding levels.

Rural Business Enterprise Grants (RBEG)

- Objective: Finance and facilitate development of small and emerging private businesses in rural areas.
- Eligibility: Nonprofits and public bodies including incorporated towns and villages, boroughs, townships, counties, states, authorities, districts, and Tribal groups.
- Amount of Funding Available: Grants are based on need and availability of funds.

Rural Business Opportunity Grants (RBOG)

- Objective: Promote sustainable economic development in rural communities with exceptional need.
- Eligibility: Public body, nonprofit corporation, Indian Tribe, or cooperative with members that are primarily rural residents.
- Amount of Funding Available: Size of grant is limited by programs funds available, most grants are \$50,000 or less.

Rural Cooperative Development Grant Program (RCDG)

- Objective: Improve economic condition or rural areas by developing new cooperatives and improving existing cooperatives,
- Eligibility: Nonprofit corporations, institutions of higher learning.
- Amount of Funding Available: Grants available for up to 75 percent of total cost of project. Applicant must provide at least 25 percent match.

Sustainable Agriculture Research and Education Program

- Objective: Support innovative research, education and projects that advance sustainable agriculture.
- Eligibility: Universities, nonprofit organizations, government agency staff, and agricultural producers.
- Amount of Funding Available: Research and Development Grants range from \$60,000 to \$150,000; Producer Grants range from \$1,000 to \$30,000; Professional Development Grants range from \$10,000 to \$100,000.

Value-Added Producer Grants (VAPG)

- Objective: Develop value-added producer-owned businesses.
- Eligibility: Individual agricultural producers, producer-controlled entities, organizations representing agricultural producers, and farmer or rancher cooperatives.
- Amount of Funding Available: Must provide equal match to funds awarded.

Wetland Reserve Program (WRP)

- Objective: Restore, protect and enhance wetlands
- Eligibility: Private land owners and land owned by Indian tribes.
- Amount of Funding Available: Permanent easement, 100 percent of easement and restoration costs; 30-year easement or 30-year contract, 75 percent agricultural value and restoration costs.

State Programs

California Farmland Conservancy Program

The California Farmland Conservancy Program (CFCP) seeks to encourage the long-term, private stewardship of agricultural lands through the voluntary use of agricultural conservation easements. The CFCP provides grant funding to local governments and qualified nonprofit organizations for projects which use and support agricultural conservation easements for protection of agricultural lands. As of

August 2011, more than 52,000 acres of farmland have been permanently conserved with CFCP-funded easements.

Williamson Act Contracts on Agricultural Land

The purpose of the Williamson Act is to help keep farmland in agricultural production by giving private property owners property tax incentives for keeping their land in production (and not developed). Within Coyote Valley, 186 acres are in Williamson Act contracts. These contracts are set to expire within 2 to 9 years.

California State Coastal Conservancy

The California State Coastal Conservancy awards grants to public agencies and nonprofit for projects including trails and other public access to and along the coast, natural resource protection and restoration in the coastal zone or affecting coastal areas, restoration of coastal urban waterfronts, protection of coastal agricultural land, and resolution of land use conflicts. The stages of a project generally funded by the California State Coastal Conservancy include pre-project feasibility studies, property acquisition, planning (for large areas or specific sites) and design, environmental review, construction, monitoring, and, in limited circumstances, maintenance.

Department of Fish and Game, Wildlife Conservation Board

The primary responsibilities of Wildlife Conservation Board (WCB) are to select, authorize and allocate funds for the purchase of land and waters suitable for recreation purposes and the preservation, protection and restoration of wildlife habitat. At its Sept. 13, 2011 meeting, the Wildlife Conservation Board (WCB) earmarked \$43.6 million to help restore and protect fish and wildlife habitat throughout California. The 19 funded projects will provide benefits to fish and wildlife species, including some endangered species, and increase public access to these lands. Several projects also demonstrate the importance of protecting working landscapes and integrate economic, social and environmental stewardship practices beneficial to the environment and the landowner.

County and City Programs

Santa Clara County Open Space Authority

Santa Clara County Open Space Authority (SCCOSA) purchases land, restores habitat and nurtures natural communities to safeguard the environment for everyone's enjoyment. Open areas of the valley floor, hillsides, watersheds, baylands, creeks, and scenic views are preservation priorities. The Authority is funded through a benefit assessment district that does not sunset. The original funding source provides \$4.1 million per year. A subsequent election yielded approximately \$28 million for opportunity acquisition.

Santa Clara County Parks Department

The Santa Clara County Parks Department has 28 parks encompassing 45,000 acres. The Department's acquisition and operations is funded through a tax of 1.425 cents per \$100 of assessed valuation. At least 20% of the funding must be allocated to land acquisition.

Land Trusts

California Rangeland Trust

California Rangeland Trust is working to permanently protect hundreds of thousands of acres of California rangeland through agricultural conservation easements to protect and enhance the environmental and economic benefits that these working landscapes provide. A conservation easement is created by the signing of an agreement between the landowner and California Rangeland Trust or any other qualified organization or government agency willing to accept the easement.

Center for Natural Lands Management

The Center for Natural Lands Management protects environmentally sensitive lands, through professional, science based stewardship of mitigation and conservation lands in perpetuity. It is presently managing more than 52,000 acres of conservation lands throughout California. This includes 72 separate projects, ranging from 1 acre to 21,000 acres, found in desert and coastal sand dunes, desert palm oases, coastal sage scrub, vernal pools, marshland, grassland and riparian forest habitats. These lands often are centered on biodiversity hotspots, which support a large number of species, including a high number of threatened and endangered species.

Peninsula Open Space Trust

Peninsula Open Space Trust (POST) preserves the beauty, character and diversity of the San Francisco Peninsula and Santa Cruz Mountain Range in northern California. Since its founding in 1977, POST has been responsible for preserving 60,000 acres as permanent open space and parkland in San Mateo, Santa Clara and Santa Cruz counties. POST currently holds 28 fee properties and 27 conservation easements and deed restrictions.

Foundations

There are many foundations that have missions and programs areas of potential relevance to the Coyote Valley agricultural lands conservation effort. The following is a brief description of a few of these:

Wildlife Heritage Foundation

Wildlife Heritage Foundation (WHF) is dedicated to preserving California's rich heritage of open spaces, agricultural land, and diverse wildlife. The organization welcomes land-conservation projects that protect wildlife habitat and educational programs that expand awareness of wildlife needs. WHF is committed to educating the public about conservation and creating and implementing educational projects on preserve sites.

The David and Lucille Packard Foundation, Conservation and Science Program

The Conservation and Science Program generally invests in policy change projects that conserve and restore ecosystems while enhancing human well-being. The foundation aims to improve the environmental performance of agriculture, while also ensuring a thriving agriculture and food system that meets the needs for nutrition, employment, and economic development.

The William and Flora Hewlett Foundation, Environment Program

The Environment Program makes grants to conserve the North American West and to tackle the problems of energy and climate change. The Environment Program pursues these goals by supporting public policy development and advocacy. It engages influential groups that care about the environment but whose voices and concerns have not always been part of the traditional environmental movement, such as hunters, anglers, ranchers, Latinos, and Native Americans.

The Gordon and Betty Moore Foundation, Land Conservation Program

The Land Conservation Program strives to sustain a healthy Bay Area ecosystem by expanding the network of conserved landscapes critical to maintaining natural systems function. The Foundation prioritizes acquisition projects that are grounded on science-based regional conservation planning. Examples of planning frameworks that receive prioritization include the Upland Habitat Goals, the Bay Lands Goals, natural community conservation plans, habitat conservation plans, and other detailed plans that delineate how a project will contribute to meaningful conservation gains over the long-term. To date, the Foundation has awarded more than \$100 million in land conservation grants, helping to conserve over 55,000 acres of land.

Financing Agriculture through Private Equity Investment

Private investors have lately been putting their money into agricultural land for more predictable returns and greater stability in their investment portfolios. Investor-owned farmland takes different forms. These include pension funds, limited partnerships, real estate investment trusts (REIT) and large investment corporations. For instance, the large pension fund, TIAA-CREFF, has \$2 billion invested in farmland in Australia, Brazil and North America. Agro REIT invests primarily in South America, as does George Soros's fund Adecoagro SA. One of the first agricultural land REITS is Gladstone Land Corp, which owns land primarily on California's Central Coast and Optima, which owns land in the mid-west and East Coast. These investors have realized healthy returns, in many cases over 10 percent annually from their investments in agricultural land. For instance, Ceres Partners LLC achieved an average annual return of 16.4 percent over the last three years. On the West Coast, one agricultural land investment firm, Farmland LP, invests in farmland and then manages its conversion to organic and sustainable practices, as a means to achieve at least double bottom line returns.

Some of the benefits of this growing trend in private investment in agricultural land are that the firms tend to manage the land using last generation technology, professional and expert management, vertical integration, and diversification and workforce training, thus producing greater productivity and returns. This growing trend is happening for several reasons.

Agricultural land has provided a stable return on investment compared with other investment options. During the past two decades, farmland has returned over 10 percent annually.³³ This compares to an average general inflation rate of 2.75 percent over the same period. Also, unlike tech stocks, the range

³³ 2011 Trends in Agricultural Land and Lease Values, CalASFMRA, 2011

of farm income returns does not vary wildly. In the last 20 years, the annual return has ranged from a low of 6.95 percent to a high of 7.68 percent.³⁴

Farmland properties require relatively little in the way of on-going capital expenditures, such as HVAC systems, roofs, electrical, etc. that are required by other types of real estate investments. Though vineyards, orchards and greenhouses have higher maintenance costs, their return on investment is also higher.

Over the last 40 years, productivity per acre of farmland has doubled, due to improved farm management practices and adoption of innovations that have increased farm yields and productivity.³⁵ By 2050, there could be 2.3 billion more people to feed. And, as more countries increase their wealth, such as China, a greater share of their diet will consist of more expensive foods, including meat, fruits, wine etc. Since land—and water—are finite resources, as the demand for food increases, so will the demand for land.

Payment for Eco-system Services (PES)

Payment for Ecosystem Services programs and markets could be a market-based alternative to traditional conservation initiatives.³⁶ By compensating landowners for the ecosystem services provided by their properties — such as clean water, flood management, clean air and wildlife habitats— PES programs provide a conservation incentive that can assist with the conservation of agricultural and forest lands.

PES programs are built on the recognition that ecosystems provide valuable and measurable services to people. Although the economic value of ecosystem services are significant, they are usually not reflected in the prices landowners receive for the goods they produce. PES programs address this disconnect by compensating landowners for the ecosystem services provided by their lands.

Like other market mechanisms, these programs identify a service to be bought and sold and define the conditions of the transaction. By linking healthy ecosystems with financial benefits, PES programs provide a positive incentive for landowners to improve and protect the environmentally significant resources on their land.

A viable PES programs includes willing sellers and buyers. Up to now, the use of PES has been driven by environmental regulations, including the Clean Water Act and the Endangered Species Act. Some government agencies, which are authorized to implement these environmental regulations, have established mechanisms for purchasing and trading credits. For instance, the USDA's Office of Environmental Markets (see http://www.usda.gov/oce/environmental_markets/farm.htm) has put together a set of case studies called, "Farm of the Future", which describes how payments for

³⁴ 2011 Trends in Agricultural Land and Lease Values, CalASFMRA, 2011

³⁵ 2011 Trends in Agricultural Land and Lease Values, CalASFMRA, 2011

³⁶ An Economic Analysis of the Benefits of Habitat Conservation on California Rangelands, Defenders of Wildlife, March, 2010.

ecosystem services helped keep farms economically viable and the same time regulate flooding and clean streams and rivers.

According to Defenders of Wildlife, the majority of PES programs that have been considered successful include buyers from the public sector. There is potential for California to encourage participation through both the public and private sector, which might include public utility districts, land trusts, and conservation organizations. There are incentives for public water utility districts in California to participate in innovative finance mechanisms. For example, paying landowners upstream to better manage their lands avoids potential costs for upgrading facilities to manage an increase in pollutant loads caused by development or conversion to other uses.³⁷

The Benefits People Obtain from Ecosystems

An ecosystem is a dynamic complex of plant, animal, and microorganism communities and the nonliving environment interacting as a functional unit.³⁸ Humans are an integral part of ecosystems. Ecosystems provide a variety of benefits to people, including provisioning, regulating, cultural, and supporting services. (See Table 20 below) Provisioning services are the products people obtain from ecosystems, such as food, fuel, fiber, fresh water, and genetic resources. Regulating services are the benefits people obtain from the regulation of ecosystem processes, including air quality maintenance, climate regulation, erosion control, regulation of human diseases, and water purification. Cultural services are the nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences. Supporting services are those that are necessary for the production of all other ecosystem services, such as primary production, production of oxygen, and soil formation.

Table 20: Ecosystem Services

Supporting	Provisioning	Regulating	Cultural
Nutrient Cycling	Food	Climate Regulation	Aesthetic
Soil Formation	Fresh Water	Flood Regulation	Spiritual
Primary Production	Wood and Fiber	Disease Regulation	Educational
	Fuel	Water Purification	Recreation

Source: Ecosystems and Human Well-being: A Framework for Assessment (Island Press, 2003), pp. 1–25.

PES Most Relevant to Coyote Valley

The ecosystem services listed below and their associated payment schemes have been identified as relevant Coyote Valley. Further research is necessary to determine (1) to what degree each service is provided at the Coyote Valley site; (2) if provided, to what degree a PES is feasible; and (3) if this list is exhaustive. The valuation of ecosystem services is context-dependent. Therefore, any service or payment scheme described below may or may not directly apply to the services offered at Coyote Valley due to difference in scale, scope and targeted market demand. More detailed information about ecosystems services and PES are included in the appendix.

³⁷ An Economic Analysis of the Benefits of Habitat Conservation on California Rangelands, Defenders of Wildlife, March, 2010

³⁸ Ecosystems and Human Well-being: A Framework for Assessment (Island Press, 2003), pp. 1–25

Table 21: Possible PES Applicable to Coyote Valley

Ecosystem Service	Payment for Ecosystem Service
Agriculture & food production	Purchasing Power, Certification schemes
Soil quality	USDA conservation programs
Carbon sequestration	Cap and trade; Voluntary CO2 offset purchasing programs
Watershed/hydrologic	Land purchase for flood control or recharge
Wildlife corridors	Conservation easement or TDRs
Pollination	Ag product certification, conservation programs

Source: *Coyote Valley Agricultural Conservancy Feasibility Study: Ecosystem Services and Payments for Ecosystem Services*, Crystal W. Simons, September 5, 2011 (See appendix.)

Agricultural Land Mitigation

The Santa Clara County Local Agency Formation Commission (LAFCO) has prepared a set of guidelines for cities that may want to establish their own agricultural land mitigation program or for use in evaluating extension of urban service areas and annexations. LAFCO suggests that “proposals involving the conversion of prime agricultural lands should provide one of the following mitigations at a not less than 1:1 ratio (1 acre preserved for every acre converted) along with the payment of funds as determined by the city / agricultural conservation entity (whichever applies) to cover the costs of program administration, land management, monitoring, enforcement and maintenance of agriculture on the mitigation lands:

- a. The acquisition and transfer of ownership of agricultural land to an agricultural conservation entity for permanent protection of the agricultural land.
- b. The acquisition and transfer of agricultural conservation easements to an agricultural conservation entity for permanent protection of the agricultural land.

LAFCO also suggests that: The agricultural mitigation should result in preservation of land [in Santa Clara County] that would be:

- a. Prime agricultural land of substantially similar quality and character as measured by the Average Storie Index rating and the Land Capability Classification rating, and
- b. Located within cities’ spheres of influence in an area planned/envisioned for agriculture, and
- c. That would preferably promote the definition and creation of a permanent urban/agricultural edge.

Currently, only the City of Gilroy has adopted an agricultural mitigation program. Morgan Hill is studying the issue. San Jose does not have an agricultural land mitigation program.

Natural Resources Mitigation

If a natural resource, such as air or water, or a threatened or endangered species is harmed, or in danger of being harmed by any type of building activity or grading, mitigation measures are implemented. This is a requirement of the environmental policies put into effect in the 1970, such as the Air Quality Act, the Water Quality Act and the Environmental Quality Act. For instance, if a construction project generates many new car trips and it is determined that this will have a negative impact on air quality,

the developer must implement mitigation measures to reduce car trips. These would include bike trails, vanpools, carpool ride-matching, commuter checks and the like. In projects that could harm protected wildlife and plant species and their habitat, mitigation measures may include the restoration of similar habitat nearby, altering of the construction method and timing and limiting the construction zone. For instance, when water districts maintain streams and creeks as part of their flood management programs, they must mitigate the loss of riparian habitat by helping to restore habitat in other riparian corridors. As another example, if roadway construction will affect habitat for mammals or birds, the project must mitigate the impact by altering the design of the roadway, making improvements to accommodate wildlife, or restoring similar habitat nearby. As a result of the need to mitigate construction and maintenance activities in the Santa Clara Valley and elsewhere, lands surrounding Coyote Valley, such as Tulare Hill and Coyote Ridge have become important as mitigation banks—areas of known habitat for protected species—that can be purchased in only the amounts needed to mitigate their activities.

CHALLENGES AND CONSTRAINTS

There are several challenges that need to be addressed in order to realize the opportunity of creating a permanent agriculture resource area in the Coyote Valley. These include the uncertainty of future development patterns, the cost of the land, flooding of certain areas and the need to accommodate the migration of wildlife and habitat conservation while at the same time managing the land for agriculture.

Uncertainty about Future Development

The South Valley has been designated as a greenbelt and as such is limited, by County policy, to agricultural and rural residential uses. The Mid Valley is also somewhat protected for exclusive agricultural uses by both County policy and San Jose's policy of protecting agricultural uses within areas designated as urban reserve. However, the North Valley incorporated into San Jose decades ago, has long been intended for office park development intended to help accommodate San Jose's need for jobs. Currently, there are several entitled projects proposed for this area that could potentially accommodate 30,000 high tech office workers. Though a return to the economic growth rates of the late 1990s is unlikely within the next 10 years, as long as the entitlements are still in effect, development could proceed anytime.

Land Prices

The market value of land in Coyote Valley reflects its potential for commercial and industrial development and exceeds the values that would make agriculture financially feasible. Though assessed values don't necessarily reflect market values, even the assessed values range from \$10,000 per acre to more than \$100,000 per acre. This is probably the biggest impediment to purchasing the land for purposes of managing it for agricultural production.

Seasonal Flooding

Seasonal flooding is common in the northern and western areas of the Valley near Fisher Creek and the area once known as Laguna Seca. Current plans for the development of North Valley acknowledge this flooding and have set aside land in the area of Laguna Seca for the purposes of flood management. In anticipation of future development, the Water District has begun construction of the water detention pond.

Challenging Agricultural Economics

Agriculture in the Coyote Valley, as in urban edge areas of growing metropolitan regions across the county, is severely challenged by factors including incompatible adjacent land uses, fragmented and smaller farmland parcels, loss of critical services, and circulation conflicts, not to mention the disincentive to invest resulting from expectation of urban development. These challenges are additive with difficulties of small and medium scale farming in general including: regulatory barriers, competition from a global marketplace, rising input costs, and equitable farm labor issues. Adaption to and adoption of alternative the agricultural production and marketing systems, such as organic practices and direct or niche marketing, that can increase profitability but only within at least a medium term time frame. Similarly, development of place-based marketing strategies such as agri-tourism requires collaborative investment in the development and branding of a place-based attributes.

OPPORTUNITIES

There are many opportunities to leverage for the development of an agricultural resource area in Coyote Valley. These include a supportive policy framework, a conducive current economic setting, and exciting possibilities created by the synergy between agricultural land preservation and enhancement and natural resource conservation efforts, and keen interest in the development of local food systems.

Supportive Policy Framework

City, county, regional and state policies provide support for the creation of an agricultural resource area.

City of San Jose

The City of San Jose’s recently adopted General Plan, Envision 2040, includes new language concerning the role of agriculture within both urban and rural areas. In particular, the City has made a clear commitment to preserve agricultural land in order to “improve the community’s access to healthful foods, promote local and ecologically sound food production, and support the ability of farmers in the region to sell their produce locally.” The City’s new policy is to “expand the cultivation and sale of locally grown agriculture as an environmentally sustainable means of food production and as a source of healthy food for San José residents.” Towards these ends, the City has spelled out five distinct means of protecting agricultural land. These include discouraging subdivision and limiting residential uses of agricultural land; encouraging conservation easements; prohibiting adjacent land uses that would compromise the viability of agriculture and maintaining the Urban Growth Boundary. The most encouraging new policy is to “keep Mid-Coyote Valley as permanent agriculture.” (LU-20.9)

Santa Clara County

The County of Santa Clara has a long-standing policy, established in the 1960s, of discouraging urban development outside of incorporated cities. Towards that end, the County has worked with all three cities in South County—San Jose, Gilroy and Morgan Hill—to agree on and adopt a set of policies that prohibit the extension of utilities to unincorporated areas and to restrict subdivision of agricultural lands. The County’s long-standing 40 acre minimum lot size requirement has helped to keep many of the parcels within the Mid-Coyote Valley at 80 acres or more.

Bay Area Region

Pursuant to California’s AB 32 and SB 375, the Bay Area Region is required to develop a Sustainable Communities Strategy which requires significant reductions in transportation-related greenhouse gas emissions. The Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) are co-leading the effort to develop the plan and have adopted a set of ten targets to be achieved by 2035. The first two of the following targets are mandated by SB 375 and the third is a regionally-specific target that is relevant to Coyote Valley.

- Reduce per-capita carbon dioxide emissions from cars and light-duty trucks by 7 percent by 2020 and by 15 percent by 2035;
- House, by 2035, 100 percent of the region’s projected 25-year growth without displacing current low-income residents; and

- Direct all non-agricultural development (100%) within the urban footprint (existing urban development and urban growth boundaries).

These targets represent a turning point in regional housing policy. Prior to this, each county was required to demonstrate how they would house their fair share of housing within unincorporated areas (mostly in conflict with county policies to discourage housing in unincorporated areas). Now, counties may focus their “fair share” in incorporated areas, called Priority Development Areas (PDAs) within the county. To reach these targets, ABAG and MTC will focus future financial³⁹ incentives to PDA and Priority Conservation Areas (PCAs). PDAs are locally identified, infill development opportunity areas near transit. PCA’s are locally-identified but regionally significant open spaces for which there exists a broad consensus for long-term protection. These areas have been identified based on criteria that are consistent with the Bay Area’s regional goals.

Current Economic Setting

In the Bay Area, similar to other metropolitan regions, the most significant drivers of development on agricultural lands are economic growth (jobs) and population growth. While the regional population has continued to grow at a steady rate of just under 1 percent per year, job growth has not kept pace. The total number of jobs is still 4 percent below the 2006 level⁴⁰ and has a long way to go to reach the level of 1.1 million jobs extant in 1999.

In the last decade, there have been two unprecedented economic downturns that have affected the pace of development activity in Santa Clara County. These two economic cycles have significantly decreased the demand for new industrial and commercial space. As a result, planned development within North Valley has not occurred and the land remains in agricultural production.

Changes in commercial lease rates and vacancy rates illustrate the effects of these two economic cycles. The first economic downturn started with the build up to the dot.com bubble in the late 1990s. At that time, average lease rates for office space in Santa Clara County were at \$8.25 per square foot. At the same time, vacancy rates were at an all-time low of 1%. The dot-com bust, which occurred in December, 2000 resulted in rents dropping precipitously and reaching a low of just under \$3.00 per square-foot for office space by 2003. Vacancy rates followed suit and went up to a high of 20% in 2003.⁴¹

The 4th quarter of 2008 was the start of the Great Recession, the second significant economic downturn in the decade. Prior to this, office vacancy rates had gradually declined to under 10% and lease rates were back up to \$5.50. Lease rates fell to a new low of just under \$1.00 by 2010, with vacancy rates back up to their post-dot.com crash rates of 20%. These two economic cycles resulted in the lowest levels of commercial and industrial development seen in Santa Clara County in several decades. Currently, the unemployment rate is 10%, vacancy rates remain above 15% and lease rates remain low,

³⁹ Transportation funding from the federal government

⁴⁰ Bay Area Council Economic Institute, Economic Forecast, 2011-2013, December 16, 2011

⁴¹ Index of Silicon Valley 2011, p. 56 Joint Venture: Silicon Valley, January 2011.

at a little above \$2.00.⁴² It will take several years of solid employment growth to create a renewed interest in new office development.

Synergy between Agricultural Land Preservation and Natural Resource Conservation

There is an opportunity to leverage the efforts of multiple agricultural, open space and natural resource conservation organizations to create a multi-use resource area within the Coyote Valley. The Valley is rich in both agricultural and environmental resources which a multitude of organizations have expressed interest in protecting. For instance, the Water District, the County and others are working to protect and, in the future, restore seasonally wet areas to their natural wetlands habitat. There are also organizations, such as the Silicon Valley Land Conservancy and the Santa Clara County Open Space Authority that are working to preserve habitat for endangered and threatened wildlife. There are also organizations, such as The Nature Conservancy and DeAnza College that are working towards creating linkages across the Coyote Valley to allow for the migration of mammals, such as Tule Elk, bobcats and coyote. Regional organizations, such as Greenbelt Alliance, have a long-standing mission of preserving agricultural lands and promoting smart infill growth.

An area planning process that involved these interested organizations, together with land owners and farmers, could result in a partnership leading to the creation of a unique agricultural, environmental and cultural resource area that could support the realization of multiple agency and organizational missions.

Local and Regional Food Systems Planning

Local food systems planning has two inter-connected drivers: (1) promotion of access to fresh, locally-grown, affordable and culturally appropriate foods for all residents, with a special focus on rectifying 'food deserts'; and (2) promotion of local sustainable agriculture, including support for urban agriculture, entry of new farmers, value-added farm enterprises, and place-based agriculture.

In the South Bay, the Santa Clara County Food System Alliance is a leading proponent for the development of local food systems. The Alliance has broad representation from agriculture, public health, environment, civic and local business communities. Its purpose is to respond to concerns around health issues in Santa Clara County, the lack of access to healthy food, the loss of ag land in the southern part of the county, and to promote a sustainable food system in the South Bay and Northern San Benito

Such focused and collaborative local efforts, combined with the general double-digit growth of the organic market and the growing demand for local food, creates a significant opportunity for new, community supported and perhaps more profitable farming in the Coyote Valley. The large and growing population of the Bay Area provides a ready, appreciative market and Highway 101 provides directly connects the Valley to all parts of the region.

Farming in the Valley provides opportunities for established and new farmers who are interested in serving local markets and farming sustainably. Revived agriculture will also provide opportunities for adjunct businesses, such as agri-tourism operations, value-added enterprises, and agricultural education programs.

⁴² Grubb & Ellis Office Trends Report—Third Quarter 2011, Silicon Valley, November 2011.

FEASIBILITY DETERMINATION AND PRELIMINARY VISION

Based on the findings from the existing conditions research, on the preliminary assessment of challenges and opportunities, and on input from technical advisors, the project funder and Partner Group have concluded that there is sufficient baseline feasibility to warrant moving ahead to Phase Two.

Technical advisors provided input on various aspects of the research during the fall of 2011. At a Workshop held on November 18 in San Jose, 39 of these advisors came together to provide feedback about the findings, refine the project vision, propose high level conceptual site plans, and outline key strategies and mechanisms necessary to realize the vision.

Preliminary Vision

The preliminary vision statement below is a raw composite of proposed refinements to a draft vision statement presented to advisors by the project team.

*“The Coyote Valley is home to a regionally significant eco-agricultural **resource area** that permanently conserves prime farmland and key habitat; ensures livelihoods for its farmers, ranchers and agricultural employees; provides healthy food and a recreational amenity Bay Area communities; and protects important ecological and cultural resources of the region.”*

Conceptual Site Plan Ideas

At the Workshop, groups of advisors were asked to sketch out on aerial maps of the Valley, conceptual locations for a potential agricultural resource area. Several common themes emerged:

- Consider all contiguous large scale, unimproved parcels for inclusion in the agricultural resource area in order to comprise a core ag area of sufficient connectivity and scale
- Use excellent agronomic values as the starting point; the best land for agriculture, in terms of soils, parcel scale and contiguous parcels, is in the Mid Valley; the North Valley has large, unimproved parcels with good soils but would need flooding issues addressed.
- Important habitat and wildlife corridor areas are located in the North and Mid Valley, generally follow water-ways, and include east-west transects across the Valley to the protected open space ridges on either side
- Consider compatible adjacent land uses and transportation uses
- Focus on the overlap and synergy between agricultural and ecological resource areas, with additional consideration for recreational uses

Initial Key Strategies and Mechanisms

Advisors at the Workshop and in other conversations amplified on an initial list of key strategies and mechanisms needed for project implementation. Input included:

- Engage current landowners in the vision by emphasizing potential economic benefits and benefit of being able to enhance farming operations through a supportive sustainability framework
- Consider public ownership of key agricultural lands so that new farmers can focus limited resources on land improvements, infrastructure development, and business development; some sort of 'Trust' mechanism could be assessed
- Hone a strategy for stakeholder conversation and buy-in that is community based, politically-astute, and fosters partnerships
- Create something that is desirable to be a part of for the farmers, that provides quality of life value for the local community, and that is branded to increase visibility and viability
- Consider potential amenities such as: an agricultural-environmental education center; demonstration and training farm; dedicated agricultural services area (or satellite); agricultural value-added enterprises area and food hub; multi-modal, farm-friendly and visitor friendly circulation system; destination farm-restaurant
- Investigate funding opportunities such as: NRCS Conservation Innovation grants; quiet partnerships between foundations and landowners; potential for using tax benefits and other economic incentives; mitigation, water banks, and other conservation strategies.
- Remove current barriers and policies that are creating disincentive for the continuation of agriculture in the region
- Research comparable models that intentionally preserve and 'develop' an agricultural area
- Identify opportunities to align public benefit with private economic benefit, in effect to efficiently spend public money with multiple benefits; some illustrative such visionary programs are around water in other communities

The Phase Two work plan that follows reflects research to date and all the input from technical advisors.

PHASE TWO WORK PLAN

Phase Two will build on the Phase One Feasibility Study findings and engagement of initial partners and advisors. The purpose of Phase Two is: (1) to refine the overall vision and formulate objectives; (2) evaluate specific conservation mechanisms and financing models that could be employed to support economically viable agricultural operations inter-connected with an ecologically valuable resources area; and (3) to identify potential implementation strategies and options for governance and ongoing management. Phase Two will also define the “service area” for Coyote Valley agriculture and the economic and environmental benefits that would accrue to the surrounding community.

Phase Two Work Plan

The tasks outlined below are a refinement of the tasks outlined in the initial project description for Phase Two. One primary change is an increased emphasis on the integration of agricultural and ecological resources within a feasible economic, regulatory, and management framework. Another refinement is the increased emphasis on process and stakeholder engagement. In Phase One, outreach primarily entailed gathering data from technical experts under the guidance of an Advisory Group. Following the Phase One positive preliminary determination of feasibility, outreach will shift focus. In Phase Two, the engagement of a broad set of stakeholders is both a key part of the process and a key desired outcome.

Task 1: Convene Partners Group and Identify the Advisory Committee

This task will convene the Partners and project team to refine the work plan tasks and timeline, including timing of meetings and communications with the Advisory Group.

1. Complete review of Phase One Feasibility Study (previously circulated in draft form)
2. Advise on and meet new members of the project team which will be expanded for Phase Two
3. Decide on members of the Advisory Committee and their roles (will draw from list of technical advisors engaged in Phase One and will include landowners and other direct stakeholders)
4. Establish an outreach plan for Phase Two, including release of the Phase One report, outreach to stakeholders, and releases to the media
5. Refine the work plan tasks and timeline, including scheduling participants for key meetings and identification of other key dates in the next ten months of particular relevance to the project

Task 2: Research and Assess Models for Formalizing an Agricultural Preservation Area

This research aspect of this task will commence at the start of Phase 2. Determination of a specific management entity will be made towards the end of Phase 2.

1. Research and evaluate existing models, in the state, country, and abroad, that have relevance for formation and management of agro-ecological resource areas. Entities could include Districts, Conservancies, Land Trusts, Agricultural Parks, private cooperatives, and other types of vehicles and/or designations
2. Determine which type of management entity(-ies) would best suit the conditions in the Coyote Valley
3. Determine which specific existing or new entity would be most suitable for undertaking management of a Coyote Valley agro-ecological resource area

Task 3: Formulate Overall Vision with Sustainability Objectives and Metrics

This task will engage the Advisory Committee to help formulate a vision and objectives for the agriculture element specifically, for the habitat area specifically, and also for the broader economic, environmental, and social context, with sections on the following:

1. The core agricultural area and its overlap with the core habitat area
2. The core habitat and wildlife corridor area and its overlap with the core agricultural area
3. The Coyote Valley as a whole including agriculture in the valley floor, agriculture in the surrounding range lands, and other land uses in the valley
4. Santa Clara County, including economic and social objectives
5. The Bay Area sustainable communities planning and implementation framework
6. The Bay Area food shed, including economic and social objectives
7. The natural systems within, adjacent to, and through the valley
8. Obtain Advisory Group input

Task 4: Develop a Program Document

This task will engage the Advisory Committee to formulate a high level program for the agriculture element and will include sections on the following:

1. Engagement of existing landowners and existing farmers in terms of those in support of and wanting to continue farming in the agro-ecological resource area, and those not in support and/or not wanting to continue as landowners and/or farmers
2. Suitable types and scales of agriculture operations, infrastructure, support services, and adjunct operations
3. Engagement of new farmers

Task 5: Develop Infrastructure Support Framework Plan

1. Natural systems framework including elements essential for the success of the core habitat and wildlife corridor area
2. Circulation network (vehicular, bicycle, pedestrian, equestrian, service access, etc.)
3. Infrastructure (irrigation system, sewer, water, storm water, utilities, etc.)

Task 6: Formulate Agro-ecological Resource Area Implementation and Management Plan

This task will result in a high-level plan that includes strategies for each of the following elements:

1. Formation of or agreement with the management entity deemed most suitable in Task 2
2. Land Use (guidelines, standards and restrictions of uses)
3. Capital Investments
4. Sources of Funds – Potential sources of funding for capital improvements
5. Political and Regulatory Support
6. Engaging farmers and related business owners
7. Ownership/ Governance Options
8. Operations – Operating revenues anticipated from farming, food sales, and supporting uses including potential agro-tourism

Task 7: Evaluate Impacts of Agro-ecological Entity (Land Values, Job Generation, Fiscal and Other Economic Impacts)

This task will evaluate the impacts of the agricultural entity (district) concept, including impacts on land values, job generation, fiscal revenues to the City of San Jose and Santa Clara County, and other economic and social impacts such as potential tourism, public health benefits, and local food source enhancements.

The analysis for this task will utilize a real estate economics tool known as a static pro forma, which calculates the approximate residual land value resulting from an assumed set of economic use. This tool will be used to compare residual land values for the Valley in its current use, compared to prototypical futures for Coyote Valley in Agricultural Entity uses. The analysis will also include a discussion of land values for urban development based on current General Plan and zoning designations.

This task will also estimate the direct, indirect, and induced levels of job creation and economic activity generated by the Ag Entity scenario, as well as the increment of fiscal revenue anticipated from enhanced agricultural uses.

Task 8: Prepare Final Report

This task will include preparation of a draft final report and draft final PowerPoint presentation for review by the Partners Group. The revised final report and revised final PowerPoint presentation will be submitted to the funder, Advisory Committee, and other stakeholders.

Phase Two Work Plan Summary

Phase Two will commence in January and is expected to take approximately eight months to complete. The Project Team will include consultants with expertise in facilitation, land economics, public finance, agricultural economics, agricultural business, food systems, natural resources management and conservation, and land use planning. The work plan will be modified as necessary to fit budgetary and timeline constraints.

APPENDICES

Technical Background Reports

Coyote Valley Agricultural Conservancy Feasibility Study: Ecosystem Services and Payments for Ecosystem Services, Crystal W. Simons, MLA-EP, MCP 2012, September 5, 2011

Coyote Valley Agricultural Conservancy Feasibility Study:
Ecosystem Services and Payments for Ecosystem Services

September 5, 2011

Prepared and written by

Crystal W. Simons, MLA-EP, MCP 2012

for
Sustainable Agriculture Education ("SAGE")

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PART A

I. Introduction

The emerging field of ecosystem services and the assessment of their value is fundamentally about connecting people to nature. Traditional conservation schemes tend to focus on local factors such as clean air, clean water, and specific habitat or species protection; their focus is usually on a non-human element. The theory behind conservation of ecosystem services and their related natural capital incorporates anthropogenic values and relationships for and toward nature, and particularly those elements of nature that benefit human sustenance and quality of life. Ecosystem services are relevant at the global, regional and local levels.

Ecosystem services are defined as “conditions and processes through which natural ecosystems, and species making them up, sustain and fulfill human life.”⁴³ Natural capital is essentially the product of ecosystem services that are valuable to humans, economically, culturally and intrinsically.

Business theories and models show that “what gets measured, gets managed”⁴⁴ and culturally we understand that we do not protect what we do not value. Indeed, “whenever societies choose among alternative uses of nature, they indicate (at least implicitly) which alternative is deemed to be worth more.”⁴⁵ If we remember that conservation goals and projects inherently function within the broader institutions of society (government, policy, development, funding structures, etc), the notion is that we might able to conserve and protect more of the environment for our own and future generations.

The ideas and theories behind the importance of natural capital have gained support in both scientific and cultural communities. But reasons aside, the measurement and valuation of ecosystem services is an emerging practice. The means and models of quantifying ecosystem services are currently evolving and in many cases are not universally agreed upon.

Existing methods of modeling ecosystem services are context-dependent. They first evaluate what services are present in a given environment and second assess what those services are worth. These two steps are crucial to determining the value of a service, and particularly the loss or gain in value if that service changes due to development or conservation alternatives. But as straightforward as the process may seem, the logistics of modeling services and assigning them value are complex because the dynamic characteristics of ecosystems are diverse. Nonetheless, all evolving methods and models strive to systematically characterize values of ecosystem services so that the results are transparent, credible and predictable.⁴⁶

Through such systematic modeling, economic values are applied to ecosystem services

⁴³ Daily, *Nature's Services*.

⁴⁴ Well known concept coined by Dr. Peter Drucker, social ecologist, writer and business management consultant.

⁴⁵ Daily, *Nature's Services*. (Lawrence H. Goulder and Donald Kennedy, in Daily 1997)

⁴⁶ Kareiva, *Natural capital*.

and natural capital. This relationship serves as the basis for the rapidly developing scheme of payments of ecosystem services (PES). Through PES, conservation projects across the globe are employing the theories behind ecosystem services and natural capital in order to influence business, community and government decisions. PES schemes help push conservation projects, and in some cases, create revenue generating land use alternatives.

Despite the growing popularity of ecosystem services and PES schemes, however, many argue that assigning a dollar value to the benefits humans gain from nature is wrong; that nature and its offerings are ‘priceless.’ It is generally accepted that this is an important point of view, and that there are indeed many services provided by nature that cannot be best quantified in an economic model. But the argument for valuing ecosystem services is centered on the notion that we need to do more in light of human use of natural capital, and that traditional methods of conservation are not achieving enough toward global conservation efforts. Rigorous PES schemes offer an opportunity to protect natural capital through social, civic and economic frameworks. Leaders in the field further argue that efforts to value ecosystem services and natural capital are complimentary to moral concerns for the intrinsic value of nature, as they broaden our collective understanding of the roles nature plays in our lives and the reasons for conserving it.⁴⁷ They rhetorically ask, “If we can add how nature contributes to human well-being to the arguments for conservation, why wouldn’t we?”⁴⁸

The field of ecosystem service assessment is rapidly gaining momentum in academic and professional spheres. As more projects promote natural capital and utilize PES, the social understanding and acceptance of ecosystem services will grow. The goal for valuation of ecosystem services to become a strong conservation tool and to be incorporated in policy and land use decisions at local, regional and global scales is not far off. Ultimately, this new approach toward nature conservation is intended to harmonize conservation and development.

II. The types of ecosystem services

“Ecosystem services are absolutely essential to civilization, but most modern urban life obscures their existence.” Daily, *Nature’s Services*.

There are a number of sources that list various ecosystem services ranging from atmospheric composition and soil retention to support of diverse human cultures and aesthetic beauty.⁴⁹ The most widely accepted taxonomy of services, however, is based on the 2005 Millennium Ecosystem Assessment (MEA), which organizes ecosystem services into four categories; three with direct impacts on humans, and one with indirect or long-term impacts. The four types of ecosystem services are:⁵⁰

- 1) *Provisioning Services* (the goods produced or provided by ecosystems)
 - a. Also called “Environmental Goods”

⁴⁷ Ibid.

⁴⁸ Ibid. (Daily et al, 2011 in Karevia).

⁴⁹ Daily, *Nature’s Services*.

⁵⁰ Millennium Ecosystem Assessment, *Ecosystems and Human Well-being: Synthesis*.

- b. Such as food, fuel, genetic resources, biochemicals, natural medicines, pharmaceuticals, ornamental resources, and fresh water
- 2) *Regulating Services* (benefits from the regulation of ecosystem processes)
 - a. Such as regulation of air quality, climate regulation, water regulation, erosion control, water purification and waste treatment, disease regulation, pest regulation, pollination, and natural hazard regulation.
- 3) *Cultural Services* (non-material benefits people obtain from ecosystems)
 - a. Such as cultural diversity, knowledge systems, education values, inspiration, aesthetic values, social relations, sense of place, cultural heritage values, and recreation and ecotourism
- 4) *Supporting Services* (services necessary for the production of all the other ecosystem services)
 - a. Such as soil formation, photosynthesis, primary production, nutrient cycling, water cycling, etc.

To illustrate, the MEA’s ‘Types of Ecosystem Services’ chart⁵¹ outlines the four primary categories and benefits within each that come from three sample landscapes: forests, oceans and cultivated/agricultural lands.

Types of Ecosystem Services

	Forests	Oceans	Cultivated / Agricultural Lands
Environmental Goods	<ul style="list-style-type: none"> • Food • Fresh water • Fuel • Fiber 	<ul style="list-style-type: none"> • Food 	<ul style="list-style-type: none"> • Food • Fuel • Fiber
Regulating Services	<ul style="list-style-type: none"> • Climate regulation • Flood regulation • Disease regulation • Water purification 	<ul style="list-style-type: none"> • Climate regulation • Disease regulation 	<ul style="list-style-type: none"> • Climate regulation • Water purification
Supporting Services	<ul style="list-style-type: none"> • Nutrient cycling • Soil formation 	<ul style="list-style-type: none"> • Nutrient cycling • Primary production 	<ul style="list-style-type: none"> • Nutrient cycling • Soil formation
Cultural Services	<ul style="list-style-type: none"> • Aesthetic • Spiritual • Educational • Recreational 	<ul style="list-style-type: none"> • Aesthetic • Spiritual • Educational • Recreational 	<ul style="list-style-type: none"> • Aesthetic • Educational

Source: Millennium Ecosystem Assessment 2005 (<http://www.millenniumassessment.org>)

According to the MEA, human use of all ecosystem services across the globe is growing rapidly, and half of provisioning services reviewed and nearly 70% of regulating and cultural services reviewed are being degraded or used unsustainably.⁵² This is a profound finding, and helps explain the growing concern for sustaining ecosystem services at all scales.

The MEA approach implies that ecosystem services have value to people, which in turn implies that ecosystem services have an economic value that can be internalized in economic policy and the market.

III. Payments for Ecosystem Services and the current state of practice

As governments, NGOs, and businesses recognize the imperative to protect biodiversity, they have begun to adopt market strategies that balance ecology and economy. The primary means of compensation for protecting natural capital or ensuring conservation of ecosystem services is in the form of payments for ecosystem services (PES).⁵³ PES monetarily compensate for maintaining certain levels of natural capital. In a compensatory mitigation scheme, for example, foresters or farmers can be paid for being good land stewards. Likewise, most PES schemes enable those who degrade ecosystems to pay for the damage they cause, reflective of the “Polluter Pays

⁵¹ Ibid.

⁵² Ibid.

⁵³ Madsen et al., “2011 Update: State of Biodiversity Markets.”

Principle.”⁵⁴ With the right schemes and appropriate incentives, rural land managers can also act as commodity producers, making sure that land is sustainably managed to provide multiple ecosystem benefits.⁵⁵

Three areas currently dominate the existing PES market for ecosystem services. Most prominent are forest services, which accommodate the open trading mechanisms of the various carbon cap-and-trade markets (nations, and some states including California, participate in an array of voluntary or mandatory local, national and global markets). The physical outcome of carbon cap-and-trade is conservation and reestablishment of forests across the world (primarily in developing nations).

Second are wetland ecosystem services, which accommodate laws in developed countries (including the US) requiring mitigation by polluting entities. Closely related to open trading, compensatory mitigation ‘banking’ protects restore and manage both water and biodiversity services that are lost due to external activities or processes.

Third are the mirage of PES schemes that accommodate other biodiversity conservation, which generally take form as land purchases, species and habitat conservation, voluntary payments (i.e. park fees, tourism), certifications (i.e. certified forest products, fair-trade, organic food), and tradable development rights (TDRs), among others.⁵⁶ The US Farm Bill conservation programs fall into this category.

Just as there is disagreement over whether or not we should assign monetary values to natural capital, there is also disagreement over the mechanisms and schemes we use to do so. There are opponents to cap-and-trade and to conservation and mitigation banking. The latter believe that “even the best managed habitat ‘banks’ can seldom supply the range of services provided by the ecosystems whose destruction they are meant to offset.”⁵⁷ Environmentalists and economists agree that there is much to be sorted out regarding the ethical and functional basis of PES. In the meantime, projects spearheading the field are seeing success, ecologically and economically. In light of the biodiversity conflict between conservation versus development, many promote the use of conservation “banks” as, at least, a partial solution.

The Ecosystem Marketplace

The leading resource for current status on various biodiversity, carbon and water markets that most PES are based upon is the Ecosystem Marketplace, a non-profit project of Forest Trends, an international collaborative organization focused on developing the implementation of PES.⁵⁸ (www.ecosystemmarketplace.com)

⁵⁴ McNeely, “Payments for Ecosystem Services: An International Perspective.”

⁵⁵ Ibid.

⁵⁶ Carroll and Jenkins, *Payments for Ecosystem Services: Market Profiles*. For the most up-to-date analysis of the various PES markets operating today, see the Appendix: “The PES Matrix Chart” produced by the group Forest Trends and the Ecosystem Marketplace.

⁵⁷ McNeely, “Payments for Ecosystem Services: An International Perspective.”

⁵⁸ For this report, specific PES schemes are sourced from reports and data made available by the Ecosystem Marketplace as of September 1, 2011.)

Carbon (CO₂) Cap-and-Trade

Carbon cap-and-trade programs are taking root globally and locally. In all programs, offsets generally function through payment made by a carbon emitter to someone else who either reduces his or her own emissions or increases the capture of CO₂ that would otherwise be emitted into the atmosphere. The 'cap' is determined by the legal allowance of industry or polluter specific emissions. Many high polluting industries, for example, include individuals with better or worse technologies. The former tend to emit fewer greenhouse gases (GHG), and the latter more. Thus a factory that is issued the same number of carbon 'credits' as its competitor, but operationally emits fewer GHGs, is able to sell their unused credits for profit. This scheme incentivizes industries to improve and invest in cleaner technologies over time, particularly as the cap is reduced. Similarly, carbon sequestration credits are available to buyers seeking to 'earn' their right to pollute, so to say.

The California Cap-and-Trade Program is expected to begin regulation on January 1, 2012, with "covered entities" not having emissions obligations until 2013. This timeframe honors California's program as the first economy wide cap-and-trade program in the United States. The program will be regulated by approved offset protocols maintained and updated by the Climate Action Reserve (CAR) and will incorporate programs across the western US and Canada to encourage regional CO₂ emission reductions and sequestration opportunities.⁵⁹ This collaboration, through the Western Climate Initiative, essentially brings the benefit of more buyers and more sellers.

A number of approved 'offset projects' already exist throughout the state, and trading is effectively functional, in a voluntary capacity. Despite the lag in legislation making it mandatory, the carbon market is currently strong, and encourages continued growth.

Compensatory Mitigation

In their 2011 Update to the State of Biodiversity Report, the Ecosystem Marketplace identified 45 existing compensatory mitigation programs around the world, with 27 more in development. These range from mitigation credit banking to offset schemes to development impact fees. Within each active program, there are many individual offset sites, including more than 1,100 mitigation banks worldwide. The conservation impact of these programs is estimated to include at least 462,000 acres of land protected or managed per year.⁶⁰

Fifteen active programs exist currently in North America. The most popular program seems to be in conservation banking, evidenced by the fact that many wetland and stream banks are sold-out. California has a total of 82 active and sold-out banks, making it the leading state in regard to conservation banking participation. The California Department of Fish and Game (DFG) defines a conservation or mitigation bank as "a privately or publicly owned land managed for its natural resource values." They explain, "in exchange for permanently protecting the land, the bank operator is allowed to sell habitat credits to developers who need to satisfy legal requirements for compensating

⁵⁹ California Air Resources Board, "Compliance Offset Protocol for Forest Projects."

⁶⁰ Madsen et al., "2011 Update: State of Biodiversity Markets."

environmental impacts of development projects.”⁶¹

In California, conservation banks typically protect threatened and endangered species habitat, while mitigation banks are specifically for wetland restoration, creation and enhancement intended to compensate for wetland losses due to development or business operations elsewhere.

According to the California DFG’s website, there are currently 25 approved compensatory mitigation banks in the counties comprising the Bay Delta Region; Santa Clara County has zero.

PART B

IV. Ecosystem services in Coyote Valley

This section outlines a number of ecosystem services, their valuation, and associated payment scheme relevant to Coyote Valley, in no particular order. Further research is necessary to determine (1) to what degree each service is provided at the Coyote Valley site; (2) if provided, to what degree a PES is feasible; and (3) if this list is exhaustive.

This list of ecosystem services is based on general and specific knowledge of the Coyote Valley site and its surrounding context. The literature and research regarding each of the following services is diverse yet much of it is directly applicable to specific locations. As noted in the introduction, the valuation of ecosystem services is context-dependent. Therefore, any service or payment scheme described below may or may not directly apply to the services offered at Coyote Valley due to difference in scale, scope and targeted market demand. The intent of this section is to give a sense of what external possibilities may exist in an alternative development scheme for the area. Efforts outlined in Phase II of this feasibility study would better determine the specific opportunities of each ecosystem service in Coyote Valley, and how they may compliment other potential alternative uses at the site.

The following information is included for each: (a) type of ecosystem service; (b) description of the service and its importance ecologically and socially; (c) theories and/or methods of valuation; and (d) existing payment for ecosystem services (PES) scheme and scope.

Following is a synthesis of these findings that highlights those services and PES schemes that may be most applicable to Coyote Valley.

a. Food production/agriculture

- i. Provisioning service
- ii. The correlation between ecosystem services, payments for ecosystem services and food production are in-depth and fairly well studied by scientists, government agencies like the FAO, and by human-rights NGOs such as the UN. In the majority of studies, the argument for protecting

⁶¹ “California Department of Fish and Game.”

ecosystem services related to agriculture is made under the interests for poverty and global food security. Accordingly, food production in itself can be considered a provisioning ecosystem service. This is most evident in poor communities or regions where people literally rely on natural capital for survival and the importance of such correlations is just. Nonetheless, the science behind agriculture and its services can be applied to any site, regardless of socio-economic concerns.

In this light, there are a suite of ecosystem services gained through sustainable agriculture, as opposed to industrial agriculture. Remembering that diversity is the key to healthy ecosystems and the provision of their services, one understands that large-scale monoculture agriculture systems do not contribute to or offer the quantity or quality of ecosystem services that small-scale diversified farming can. Organic, integrated and small scale agriculture that honors diversity in crops and therefore regenerates soil, manages water consumption, utilizes natural pest control rather than pesticides is that which fosters a healthy ecosystem and therefore contributes to services.

- iii. It must be acknowledged, however, that at the global scale agriculture is most often the reason for loss of ecosystem services. Government offered incentives in Africa for farmers to cut down forest in order to cultivate food is just one of many examples. There and elsewhere, the change in land cover from forest or natural landscape to agriculture is a major concern with regard to ecosystem services such as soil erosion and flood control. The Food and Agriculture Organization of the US (FAO) accepts this concern in their 2011 report titled *Payments for Ecosystem Services and Food Security* by noting, "it is evident that agriculture represents one of the main anthropogenic activities influencing the preservation or the disruption of ecosystem services."⁶²
- iv. The current method of valuation and for payment in agricultural related services are through purchasing power and certification schemes that expose consumer preference and are procurement driven. The 2008 market for organic foods and other certified agricultural products was estimated at over \$26 billion in annual global sales and had a projected growth rate of 30% annually.⁶³ Such payments represent a profound resource for contributing to well managed agricultural practices. The FAO predicts that a new generation of agriculture-related PES could see a combination of certification schemes and community-based incentives.⁶⁴ This would realize a market where economic, ecological and social dimensions are fully integrated.

b. Soil

⁶² Food and Agriculture Organization of the United States (FAO), "Payments for Ecosystem Services and Food Security," 5.

⁶³ Carroll and Jenkins, *Payments for Ecosystem Services: Market Profiles*.

⁶⁴ Food and Agriculture Organization of the United States (FAO), "Payments for Ecosystem Services and Food Security."

- i. Supporting service (nutrient cycling)
- ii. Despite being commonly known simply as ‘dirt,’ soil is in fact a complex, dynamic ecosystem that sustains physical processes and chemical transformations that are critical to human life. In these processes, organisms in the soil regulate the levels of certain greenhouse gases: CO₂, CH₄, and N₂O. Soil also fosters the entire terrestrial food chain, and plays a critical role in aquatic systems.⁶⁵ The specific ecosystem services supplied by soil include:⁶⁶
 - 1. Buffering and moderation of the hydrological cycle
 - 2. Physical support of plants
 - 3. Retention and delivery of nutrients to plants
 - 4. Disposal of wastes and dead organic matter
 - 5. Renewal of soil fertility
 - 6. Regulation of major element cycles
 - 7. Sequestration of carbon (CO₂).
- iii. In theory the total value of soil is infinite because it includes the total value of human society and millions of other species. But realistically, very few PES schemes exist that directly associate a service with soil. Those most applicable include carbon sequestration (explained in greater detail below) and potential US Farm Bill conservation programs.
- iv. Farm Bill conservation programs function through government payments and grants to private landowners, tribes, states, and nonprofit organizations for the protection, restoration and enhancement of various ecosystem types. Payments to farmers to conserve soil and maintain farmland productivity date to the 1930s.⁶⁷ Current farm bill provisions typically are for time periods between 5 and 30 years. They fall into four categories: (1) education and technical assistance; (2) financial incentives for natural resource conservation objectives, including permanent easement establishment; (3) conservation support to reduce soil erosion, protect wetlands, improve water quality, etc.; and (4) support for meeting regulatory requirements for air and water quality, species protection, and wetland protection.⁶⁸ While many of these definitions seem applicable to Coyote Valley, the fact is that the majority of farm bill payments are allotted to farmers who participate in the Conservation Resource Program, and particularly those in the US ‘corn belt.’⁶⁹ It would be very competitive to solicit PES under this scheme.

c. Carbon sequestration and storage

- i. Supporting service (carbon cycling)
- ii. Forests, grasslands, and other ecosystems remove carbon dioxide from the atmosphere through the storage of CO₂, the most common greenhouse gas,

⁶⁵ Daily, *Nature’s Services*.

⁶⁶ Ibid.

⁶⁷ Scarlett and Boyd, *Ecosystem Services: Quantification, Policy Applications, and Current Federal Capabilities*.

⁶⁸ Ibid.

⁶⁹ Ibid.

as part of the process of photosynthesis. Old growth forests are the most productive carbon 'sinks.'

- iii. Carbon sequestration is the most widespread, and certainly most publically known, of the marketed ecosystem services. This is likely due to the ongoing and politically contentious climate change and global warming debates. From the economic point of view, cap-and-trade has been effectively mitigating sulfur dioxide (SO₂) since the 1980s, under the Clean Air Act. While national carbon cap-and-trade has not yet been legislated, the State of California is on target to initiate the first US economy-wide program in the US in 2012. Measured by the ton, CO₂ limits are stipulated by industry, and offsets are traded or purchased to encourage emission reduction and sequestration of CO₂. Essentially two entities are able to sell offsets: industry individuals granted offsets that they do not use, and approved offset projects that typically undergo third-party verification and management.
- iv. The strength of the carbon market has drawn the attention of science and many emerging technologies (i.e. cement sequestration) are currently being developed. The scale of sequestration possible by such technologies is, however, small compared to that offered by healthy forest ecosystems. Thus, the natural PES schemes around carbon remain strong. CO₂ offsets are available for purchase today, under voluntary schemes. The global market potential of voluntary carbon offsets is estimated to be between \$10 million and 5 billion dollars per year by 2020.⁷⁰ The addition of the compliant carbon market nearly doubles this estimate annually.

d. Watershed/Hydrologic Ecosystem Services

- i. Provisioning, Regulating, Cultural and Supporting, depending on specific conditions
- ii. Hydrologic ecosystem services range from the supply of household water use to the mitigation of flood damages. Freshwater services are typically organized into five categories:⁷¹
 - 1. Improvement of extractive water supply
 - 2. Improvement of in-stream water supply
 - 3. Water damage mitigation
 - 4. Provision of water related cultural services
 - 5. Water-associated supporting services

In general, water supply is a provisioning service in that it is extractive. Municipal, agricultural, industrial, and energy uses all extract water for things like drinking water, recreation, transportation, fish production, and power generation among others. The water-related support services of terrestrial ecosystems are equally as broad, and fundamentally include the

⁷⁰ Carroll and Jenkins, *Payments for Ecosystem Services: Market Profiles*.

⁷¹ Brauman et al., "The Nature and Value of Ecosystem Services: An Overview Highlighting Hydrologic Services."

provision of water for plant growth and to create habitats for aquatic organisms.

- iii. Means of valuing watershed services are vast and require demonstrable scientific evidence to link land uses to water quality. Tangibly, each hydrologic service is defined and measured by quantity, quality, location and flow.⁷² In order to establish viability for marketing watershed services, monetary values are assigned to the services marketed. For example, one might estimate the avoided cost of providing clean, reliable water sources using reservoirs and filtration plants. Similarly, in a natural watershed or creek restoration situation, monetary value can be established by demonstrating avoided costs, from flood risk or damage, for example. As the water market becomes more robust, valuation methods also are improving. At any valuation, PES schemes for watershed services must be traded on a watershed or sub-watershed level, which effectively limits the size and scope of potential markets.
- iv. Accordingly, the Santa Clara Valley Water District has an Ecological Monitoring and Assessment Program (EMAP) Framework that will result in a multi-year monitoring and stream assessment program for primary interests in Santa Clara County. In 2011, the Coyote Creek watershed was assessed under the EMAP Framework. It determined that approximately 70% of the watershed has medium scores for current stream ecological conditions, indicating that ecosystem services offered by the watershed as a whole are also mid-level.⁷³ These results provide an understanding of how well ecological resources are functioning in comparison to established benchmarks. The Santa Clara County Water District, however, has not yet established watershed-scale levels of service (LOS) benchmarks, which will be a necessary step if specific ecosystem service index (ESI) are to be calculated and applied to project sites scoring high enough to warrant protection.⁷⁴ A separate report, the Coyote Creek Watershed Historical Ecology Study (also prepared for the Santa Clara Valley Water District) foreshadows the potential for restoration of watershed functions, natural flood protection and integrated water management in Coyote Valley, and throughout the entire watershed.⁷⁵

Eventually more regional watersheds will be assessed under the EMAP framework with the hope that regional information will avoid piecemeal understanding of the county's stream ecosystem conditions. While this program does not in itself estimate or assess ecosystem services or their values, the fact that it is being applied at the watershed rather than the individual project level is an important planning tool for establishing benchmarks from which values could later be assessed using those methods

⁷² Ibid.

⁷³ Santa Clara Valley Water District, *Stream Ecosystem Condition Profile: Coyote Creek Watershed*, 6.

⁷⁴ Ibid, 8.

⁷⁵ Grossinger et al., *Coyote Creek Watershed Historical Ecology Study: Historical Condition, Landscape Change, and Restoration Potential in the Eastern Santa Clara Valley, California*.

required by any sought PES scheme.

e. Wildlife Corridors

- i. None; possibly Supporting
- ii. Nowhere in the literature are wildlife corridors specifically called out as a direct ecosystem service. In our research, however, it is evident that any particular wildlife corridor may accommodate a multitude of other ecosystem services, in any of the four types. The specific services or PES applicable to a given wildlife or habitat corridor would depend upon the quality or type of land cover, soil, vegetation, or cultivation in place; essentially, the quality and kind of biodiversity supported. To that end, the connection between habitat corridors and biodiversity has been researched extensively in academia and science. Conservationists often identify habitat conservation networks that maximize habitat or species persistence in order to protect what remains of declining biodiversity.⁷⁶ In the public realm, through the establishment of the Western Wildlife Habitat Council, the Western Governors' Association recognized that "crucial habitats and corridors provide ecosystem services that range from enhancing water quality to creating recreational opportunities to ensuring the pollination of crops."⁷⁷ In fewer circumstances, a habitat corridor might serve doubly for carbon sequestration.
- iii. In-depth research is necessary to determine applicable PES schemes for the existing wildlife corridors around and throughout Coyote Valley. First, corridors need to be identified. Supporting evidence of specific species dependency should be documented, and habitat criteria for that species would need to be categorized. A land assessment of such criteria would then need to be pair with the criteria necessary for any other ecosystem service. Any PES associated with the wildlife corridor would likely be attached to another ecosystem service made available by the existence of the corridor in the Coyote Valley location. Likewise, the magnitude of any PES would either depend upon one of two conditions: (1) specific species, their status as endangered or threatened, and any evident public affinity, locally or nationally; and/or (2) any supporting or provisioning ecosystem service made possible by the existence of the corridor, such as carbon sequestration, food cultivation, plant pollination, or wetland mitigation. Any of these associated services are highly species dependent and habitat specific.
- iv. The most likely PES related to wildlife/habitat corridors would be either in the form of compensatory mitigation (government PES), conservation easement, US Farm Bill conservation program, or as philanthropic donations. In each of these schemes, the common metric for valuation is area and quality of habitat protected or restored, or species conserved.

f. Pollination

⁷⁶ Nelson et al., "Terrestrial biodiversity."

⁷⁷ Western Governors' Association, "Western Wildlife Habitat Council Established."

- i. Supporting service (nutrient distribution)
- ii. Beyond the obvious act of distributing the pollen of many plant species, pollinators (bats, bees, beetles, birds and butterflies, and thousands of other insect species) collect foodstuffs and redistribute nutrients through their nitrogen-rich waste. Pollination is important from a global perspective because it ensures biodiversity. Without the services of pollinators occurring at the local and regional scales, global biodiversity will decrease. Regionally and locally, this is especially relevant in urban areas where the percentage of land cover with diverse plant species that support populations of productive pollinators is low.
- iii. In general, there are two types of valuations for the benefits humans gain from pollinators, economic values and noneconomic values. The former is most often estimated through assessment of market rates for crops that rely on pollination, like coffee. This relies on factors of supply and demand, and is therefore more of a socio-economic valuation than an ecological one. Noneconomic values, which include the time-honored evolution of plant species and generation of biodiversity at both global and local scales, are much more difficult to quantify and monetize.⁷⁸ Nonetheless, the value of native pollinators to the 2010 agricultural economy of the US was estimated to be in the order of at least US\$4.1 billion per year.⁷⁹
- iv. PES schemes for pollination can come in a variety of packages. Most common are the certification of agricultural products, but habitat conservation and biodiversity schemes are relevant as well, particularly given the popularity of the honey bee issue and native pollinator species. In either case of habitat conservation or product certification, the duration of a PES scheme would depend on the specifics of quantity, quality and demand for a specific pollination service.

PART C

Synthesis of Findings

Despite the growing popularity of ecosystem services and the market development of payments for ecosystem services, there are currently few opportunities to earn such payments outside of carbon sequestration, compensatory mitigation, and voluntary biodiversity payment schemes.⁸⁰ At Coyote Valley specifically, the most feasible PES schemes for the short term (assuming no drastic land use changes) include, in no particular order:

- (a) the establishment of one or more compensatory mitigation bank(s);
- (b) the establishment of an approved offset project, likely through the Climate Action Registry to enable future compliance with the California Cap-and-Trade Program; and/or
- (c) the bundled benefits from land conservation and certified product payments. These include but are not limited to agricultural related certifications, park fees, tax policies, and voluntary private PES.

The multitude of these schemes fall under the PES categories of Compliant Biodiversity Offsets,

⁷⁸ Daily, *Nature's Services*. pg. 145.

⁷⁹ McNeely, "Payments for Ecosystem Services: An International Perspective."

⁸⁰ Carroll and Jenkins, *Payments for Ecosystem Services: Market Profiles*.

Voluntary Biodiversity Offsets, Government-Mediated Biodiversity Payments, Voluntary Watershed Management Payments, Recreation, Land Conservation, Cap-and-Trade Compliance, and Certified Agricultural Products.

In most cases, any significant PES scheme will require permitting, classification and continued management of ecosystem services. These options have good potential for success given the current conditions of the Coyote Creek Watershed and the demand for offsets regionally in the Bay Area at large.

PART D

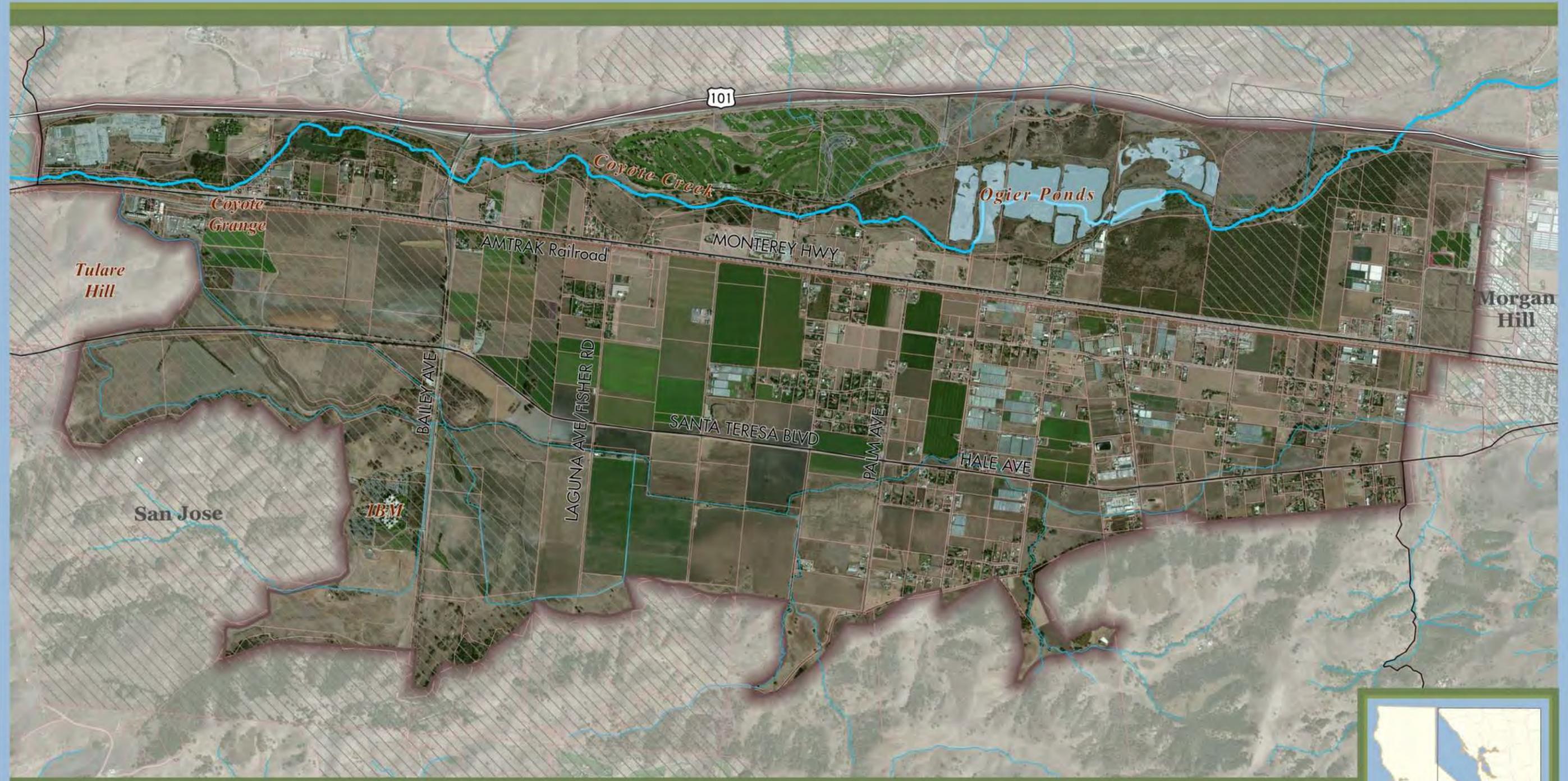
V. References

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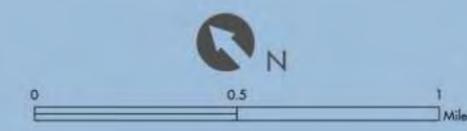
Maps

- Aerial
- Coyote Valley Basemap
- Policy Framework: County of Santa Clara
- Policy Framework: San Jose 2040 & Morgan Hill
- Agricultural Production
- Open Space (regional)
- Farmland Mapping and Monitoring
- Hydrology
- Habitat: Plants
- Habitat: Amphibians
- Habitat: Birds & Mammals (regional)
- Habitat: Birds & Mammals
- Wildlife Linkage Zones and Hotspots
- Wildlife Linkages
- Land Values
- Land and Improvement Values

Aerial



- Coyote Valley Boundary
- Incorporated Region
- Coyote Valley Parcels
- Freeway
- Roads
- AMTRAK Railroad
- Streams
- Water Bodies



Data Sources:
County of Santa Clara
Bing Aerial 2010

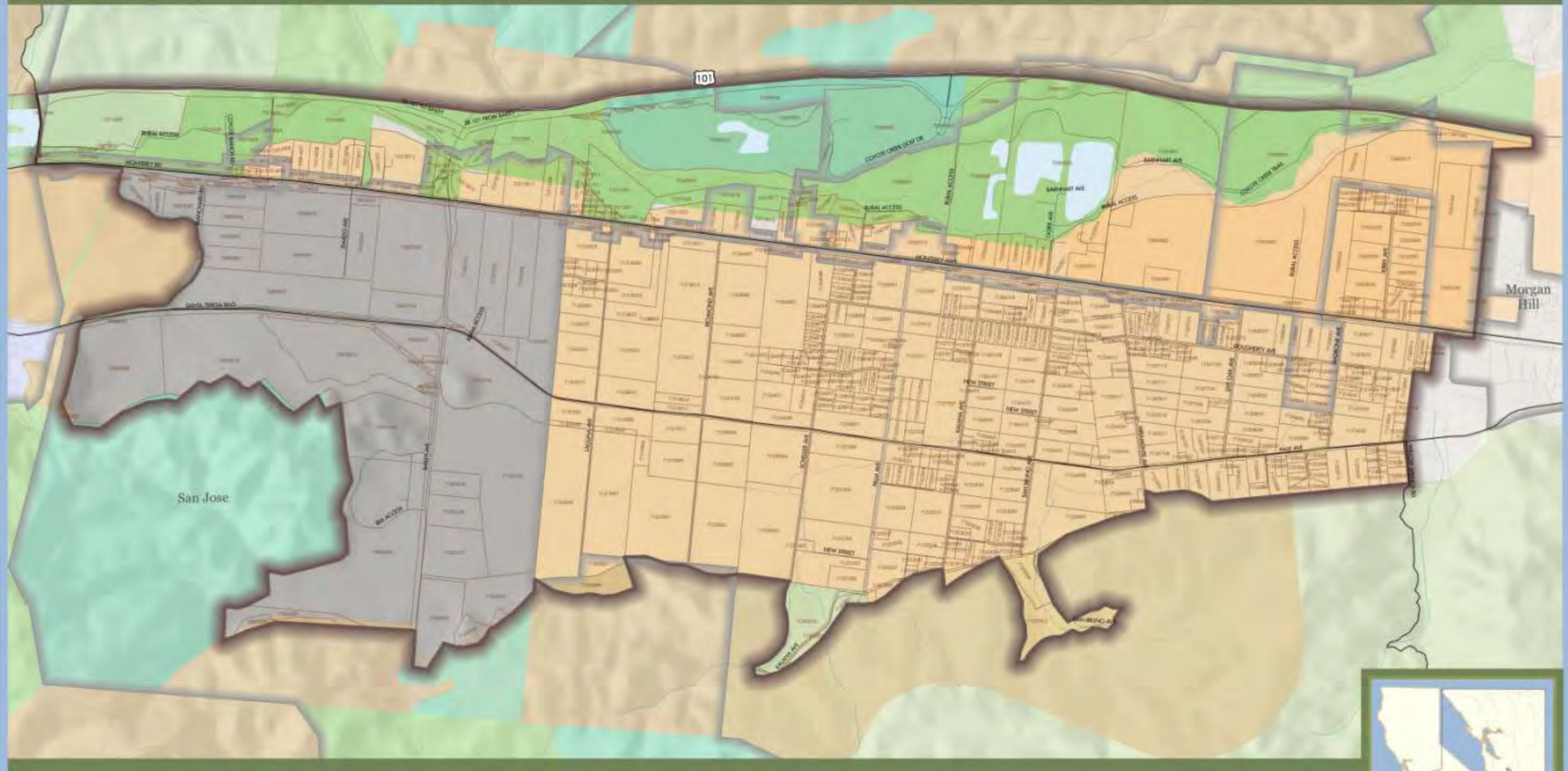
Map produced by GreenInfo
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October 5, 2011

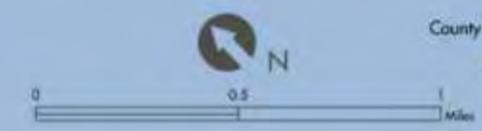


Coyote Valley Basemap

CONSERVING
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AGRICULTURE



- | | | | | |
|------------------------|--------------------|--------------------------------|------------------------|--------------|
| Coyote Valley Boundary | Agriculture | Private Open Space/ Recreation | Freeway | Streams |
| Coyote Valley Parcels | Campus Industrial | Public Park and Open Space | Roads | Water Bodies |
| Incorporated Region | Non-Urban Hillside | Public/Quasi-Public | Union Pacific Railroad | |
| | Ranchlands | | | |

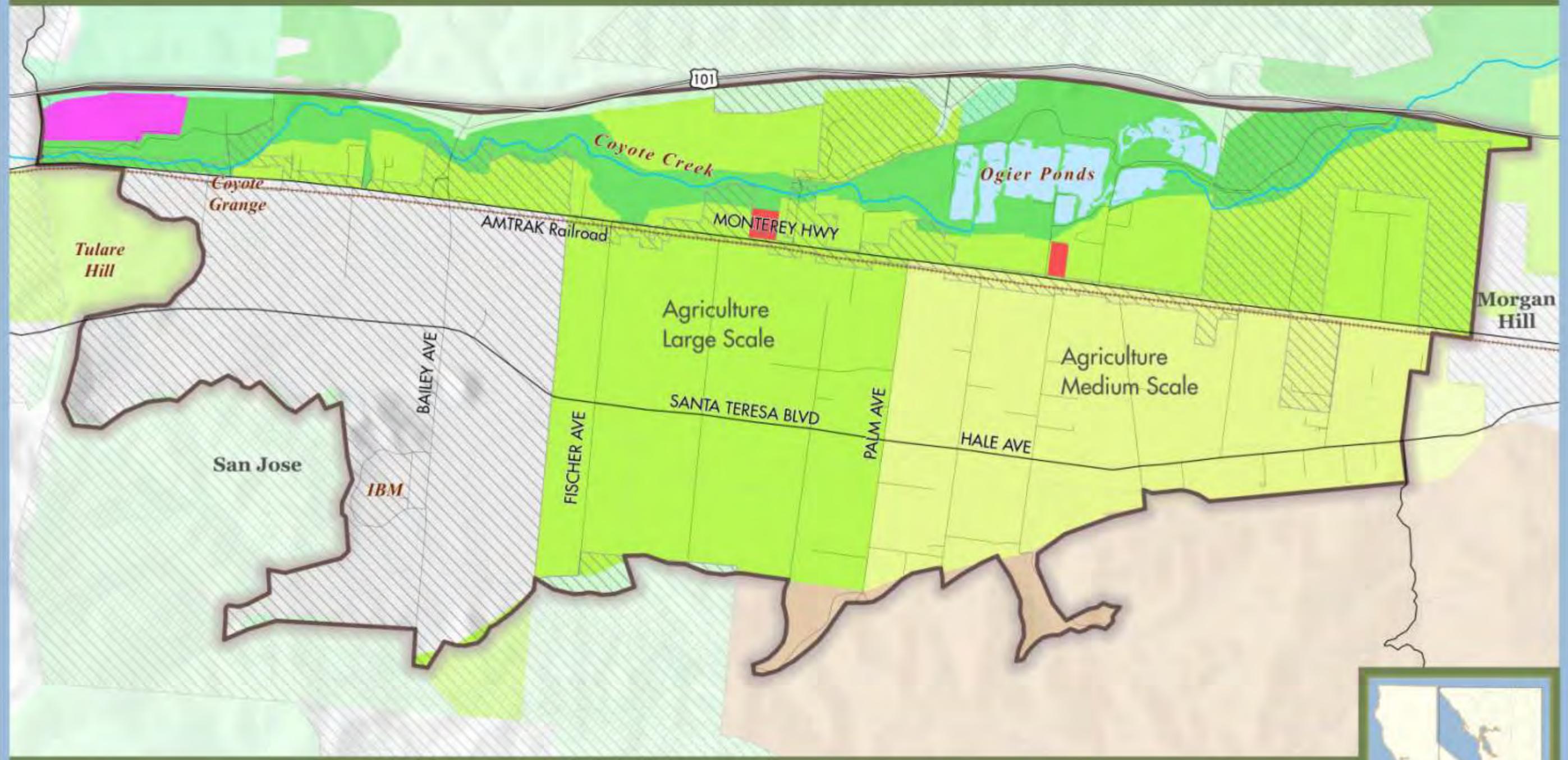


Data Sources:
County of Santa Clara, City of San Jose
Map produced by Geomatics
Network using ESRI software.
October 5, 2011

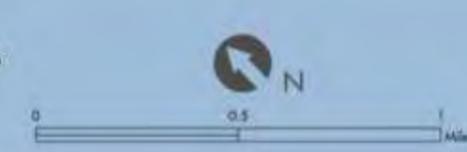


Policy Framework: County of Santa Clara

CONSERVING
COYOTE VALLEY
AGRICULTURE



- | | | | |
|------------------------|----------------------------------|--------------------------|--------------|
| Coyote Valley Boundary | Land Use | Other Public Open Lands | Streams |
| Incorporated Region | Agriculture Large Scale | Ranchlands | Water Bodies |
| Freeway | Agriculture Medium Scale | Regional Parks, Existing | |
| Roads | Hillsides | Roadside Services | |
| AMTRAK Railroad | Major Gas and Electric Utilities | | |

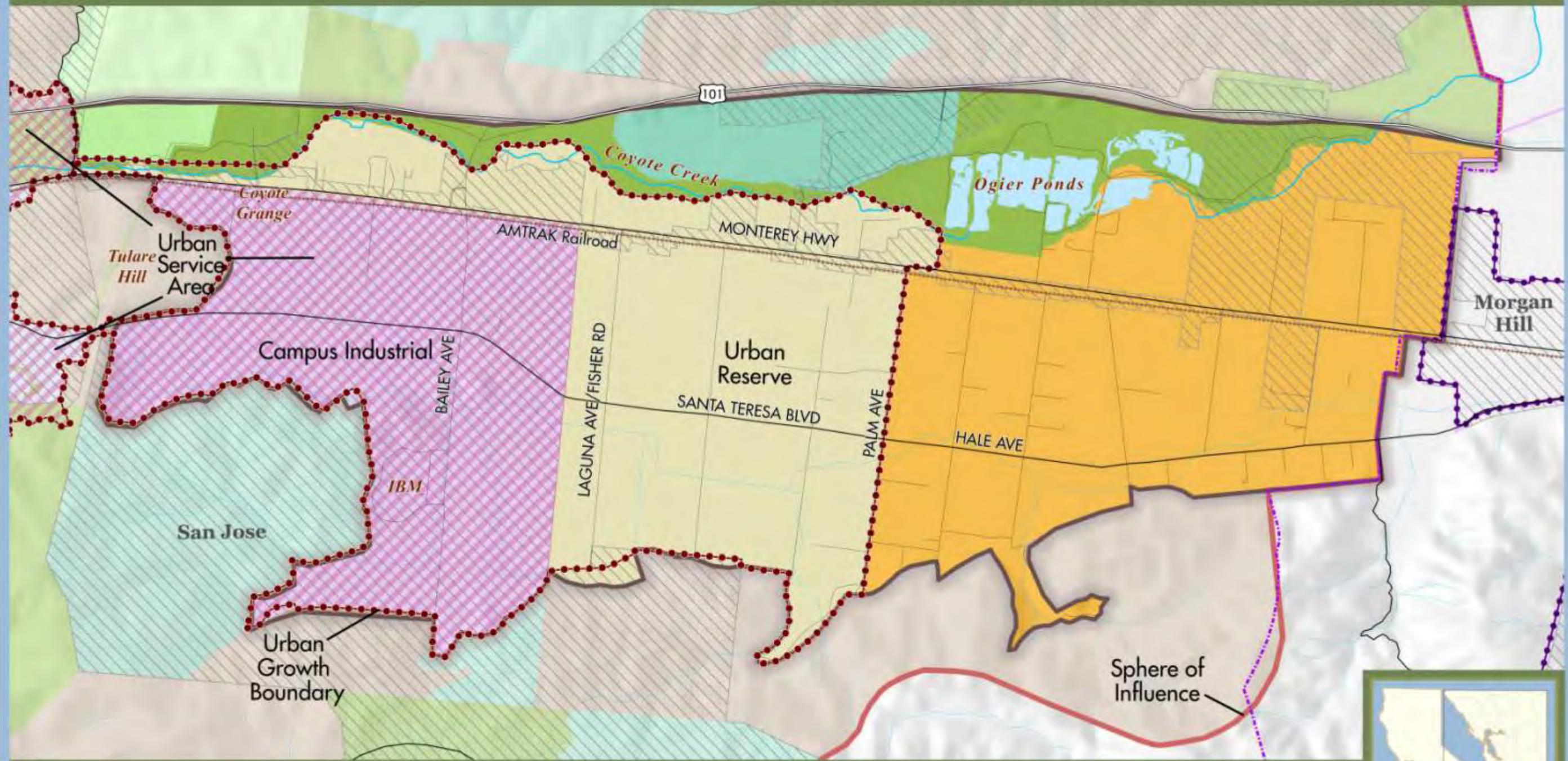


Data Sources:
County of Santa Clara
Map produced by GreenInfo
Network using ESRI software.
October 5, 2011



Policy Framework: San Jose 2040 & Morgan Hill

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COYOTE VALLEY
AGRICULTURE

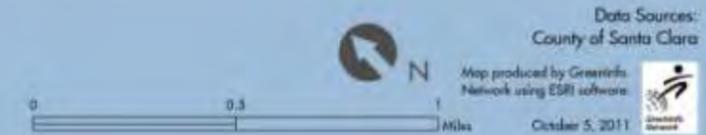
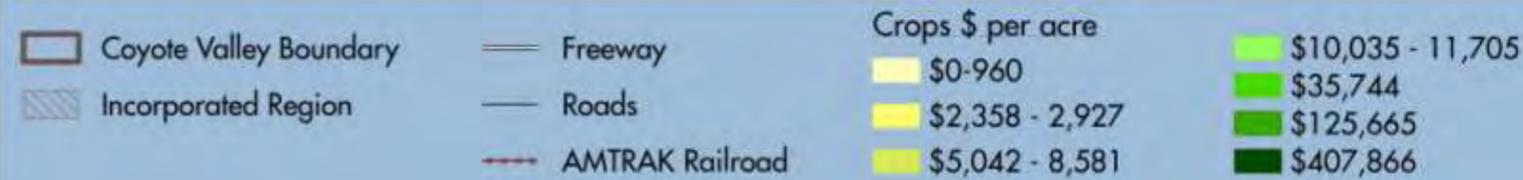
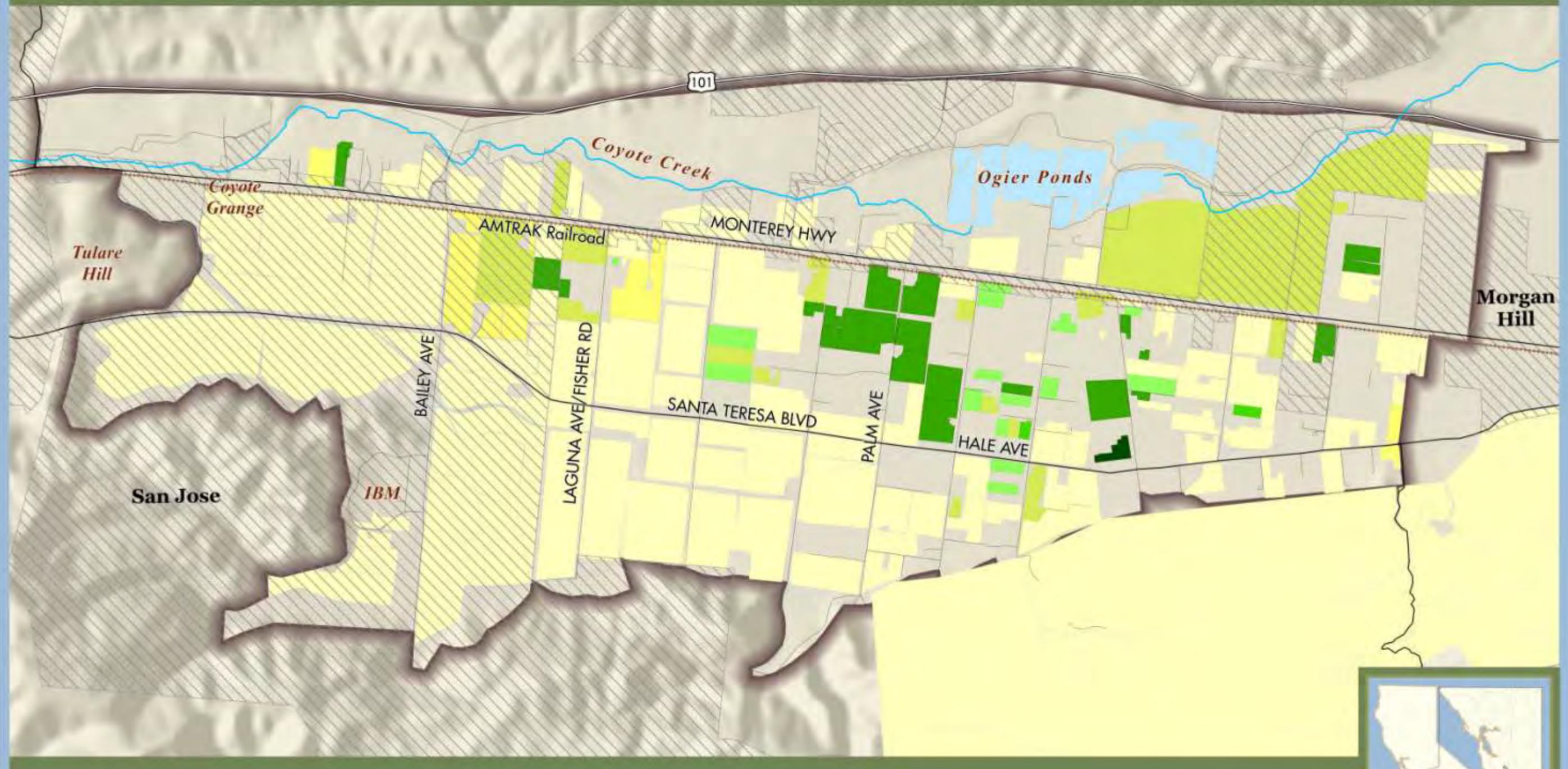


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|------------------------|--------------------------|-------------------------------|-----------------------------|
| Coyote Valley Boundary | San Jose Land Use | Private Open Space/Recreation | Morgan Hill Land Use |
| Incorporated Region | Agriculture | Public Park and Open Space | MH Urban Growth Boundary |
| Freeway | Campus Industrial | Public/Quasi-Public | MH Urban Limit Line |
| Roads | Non-Urban Hillside | | MH Sphere of Influence |
| AMTRAK Railroad | | | |



Agricultural Production

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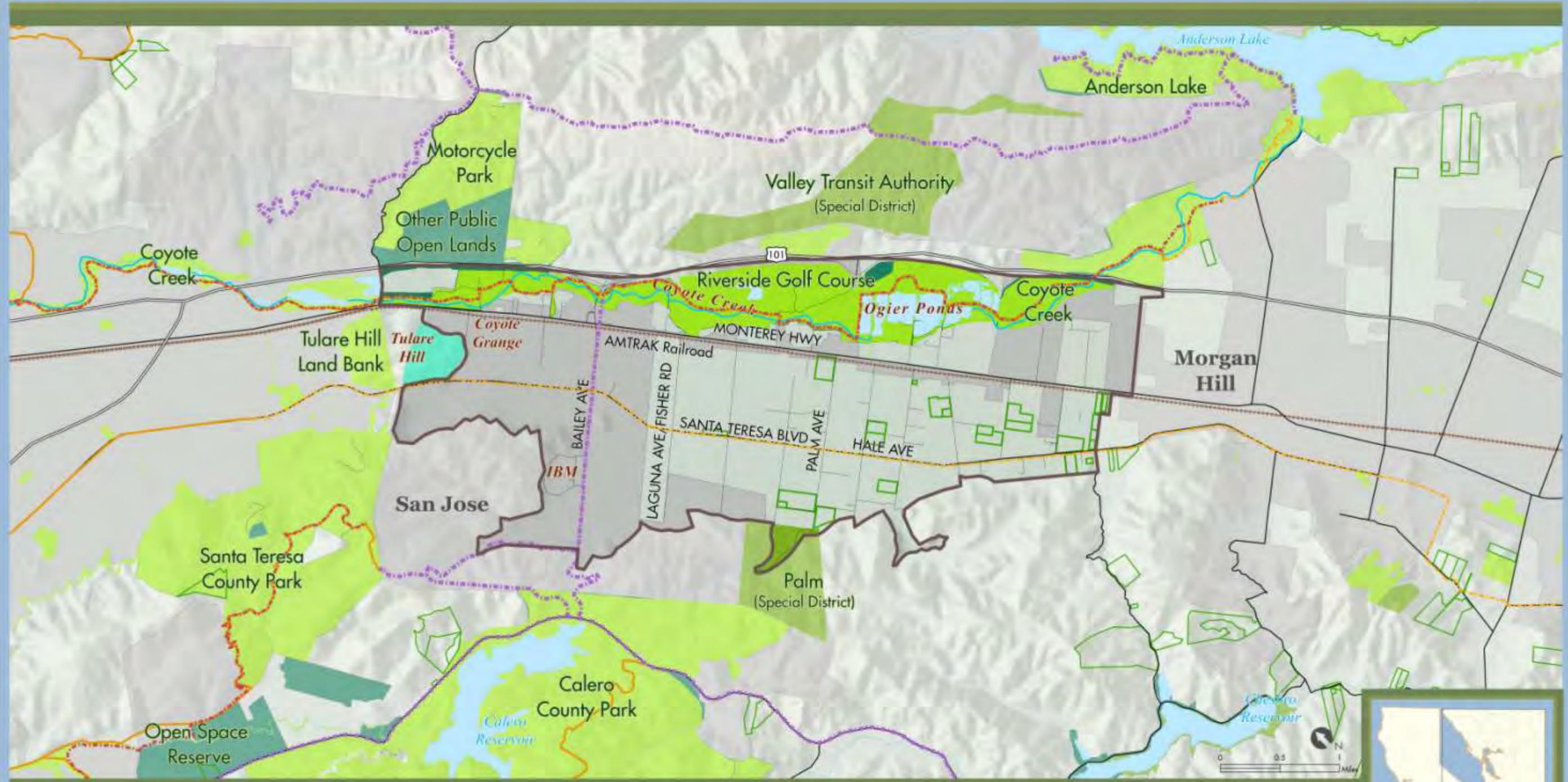


Data Sources:
County of Santa Clara



Open Space

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COYOTE VALLEY
AGRICULTURE

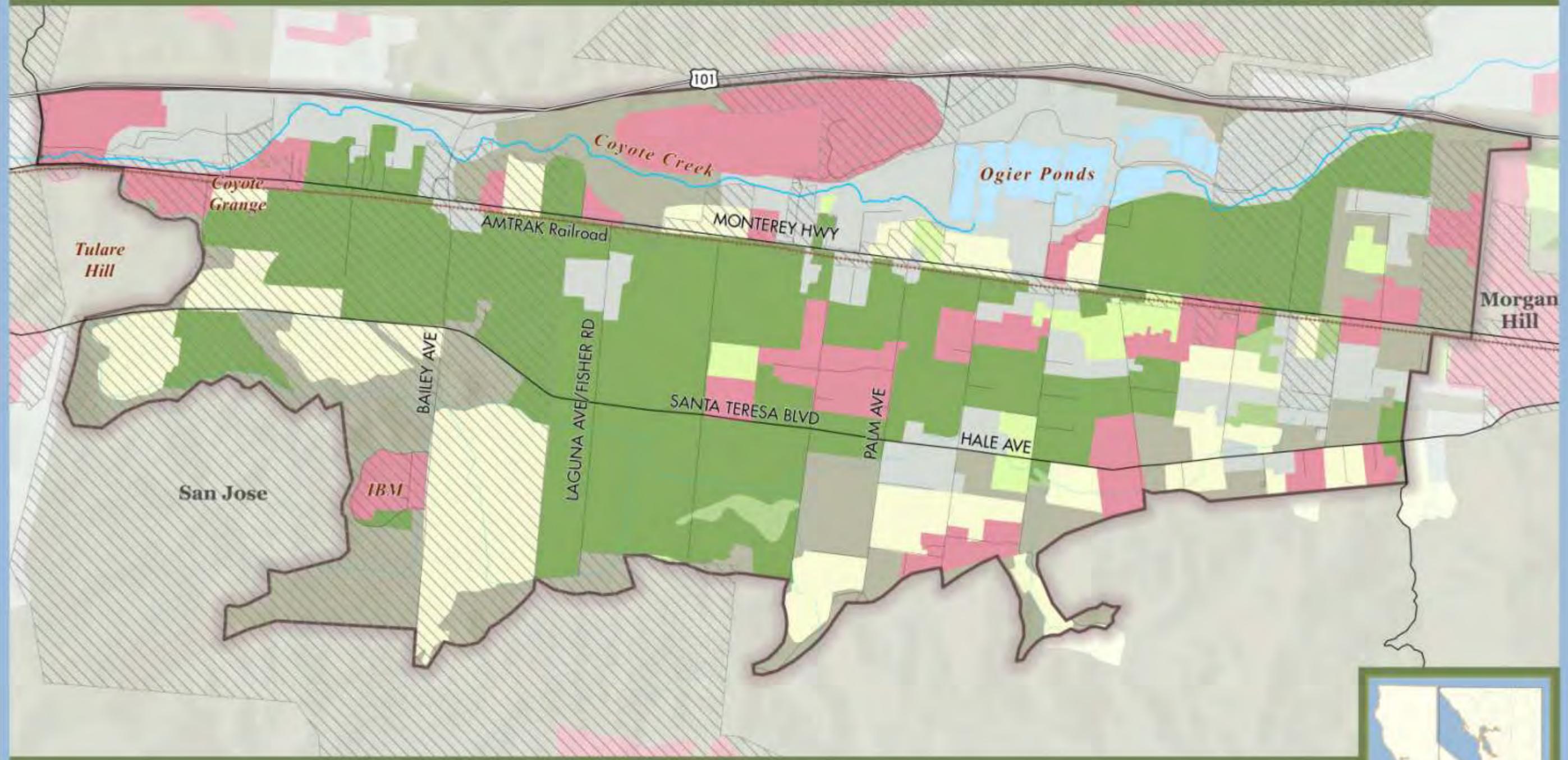


<ul style="list-style-type: none"> Coyote Valley Boundary Incorporated Region Highways Streams Water Bodies 	<ul style="list-style-type: none"> CPAD City; County CPAD Non Governmental Organization CPAD Special District 	<ul style="list-style-type: none"> Other Protected Areas Open Space Reserve, Other Public Open Lands Williamson Act Parcel 	<ul style="list-style-type: none"> Trails Bay Area Ridge Trail Service or Unpaved Road Unpaved Trail 	<ul style="list-style-type: none"> SC Master Plan Trails Completed Partially Completed Undeveloped 	<p>Data Sources: County of Santa Clara, CPAD, NCED, Bay Area Ridge Trail</p> <p>Map produced by GreenInfo Network using ESRI software.</p> <p>October 18, 2011</p>
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Farmland Mapping and Monitoring

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COYOTE VALLEY
AGRICULTURE



Coyote Valley Boundary	Freeway	FMMP	Local	Prime	Grazing
Incorporated Region	Roads	Unique	State	Developed	Other Lands
AMTRAK Railroad					

Data Sources:
County of Santa Clara, City of San Jose
CA Department of Conservation

Map produced by GreenInfo
Network using ESRI software.

October 5, 2011

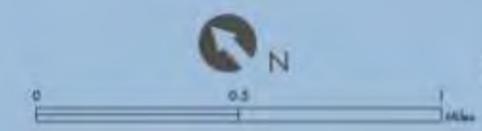


Hydrology

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COYOTE VALLEY
AGRICULTURE



- | | | | |
|------------------------|--------------|--------------------|-------------------------|
| Coyote Valley Boundary | Streams | Existing Wetlands | GW Subbasin |
| Freeway | Water Bodies | Potential Wetlands | FEMA Flood Plain |
| Roads | Canal | Riparian Wetlands | 1000ft Standing Station |
| AMTRAK Railroad | | | |



Data Sources:
County of Santa Clara
Water District, FEMA

Map produced by GreenInfo
Network using ESRI software.

October 5, 2011



Habitat: Plants



Coyote Valley Boundary	Freeway	Plants: Primary Range	Hall's Bush Mallow	San Francisco Collinsia
Incorporated Region	Roads	Big Scale Balsamroot	Mt. Hamilton Thistle	Most Beautiful Jewelflower
AMTRAK Railroad		Fragrant Fritillary	Loma Prieta Hoita	Robust Monardella
		Smooth Lessingia	Metcalf Canyon Jewel-flower	

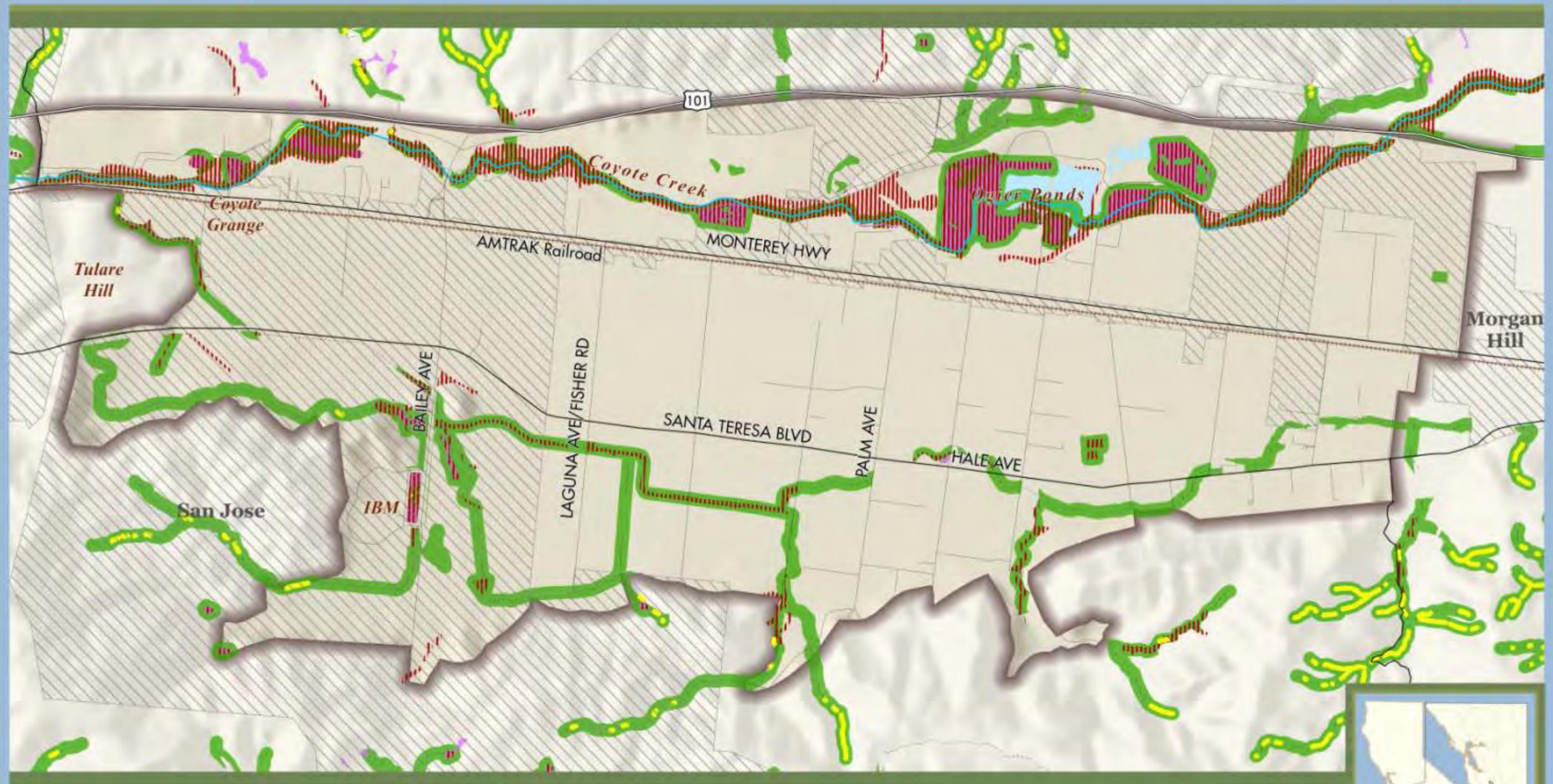
Data Sources:
County of Santa Clara
HCP/NCCP

Map produced by GreenInfo
Network using ESRI software.

October 5, 2011



Habitat: Amphibians

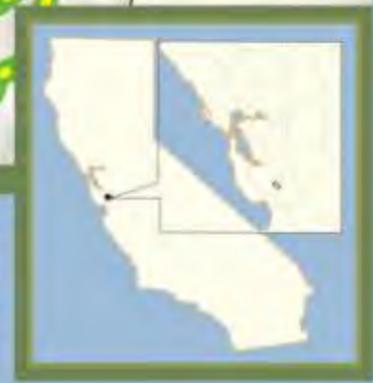


Coyote Valley Boundary	Freeway	Amphibians: Primary Range	California Red-legged Frog
Incorporated Region	Roads	Foothill Yellow-legged Frog	California Tiger Salamander
AMTRAK Railroad		Western Pond Turtle	

Data Sources:
County of Santa Clara
HCP/NCCP

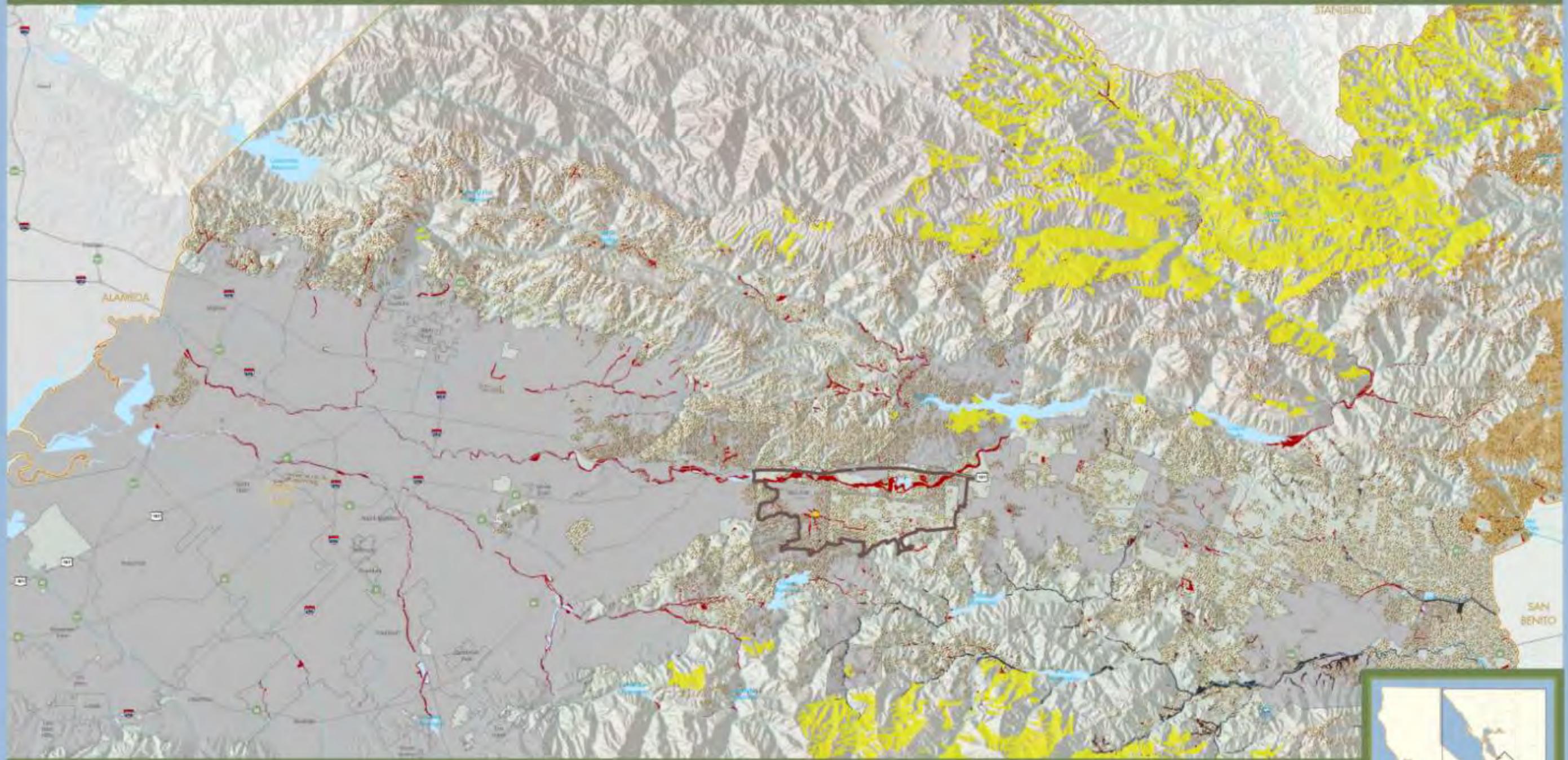
Map produced by GreenInfo
Network using ESRI software.

October 5, 2011



Habitat: Birds & Mammals

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|------------------------|--------------|--|---|
| Coyote Valley Boundary | Streams | Least Bell's Vireo (Primary Habitat) | Western Burrowing Owl (Overwintering Habitat) |
| Incorporated Region | Water Bodies | Golden Eagle (Primary Habitat) | San Joaquin Kit Fox (Secondary Habitat) |
| Highways | | Tricolored Blackbird (Primary Habitat) | |



Data Sources:
Habitat Data;
County of Santa Clara
HCP/NCCP

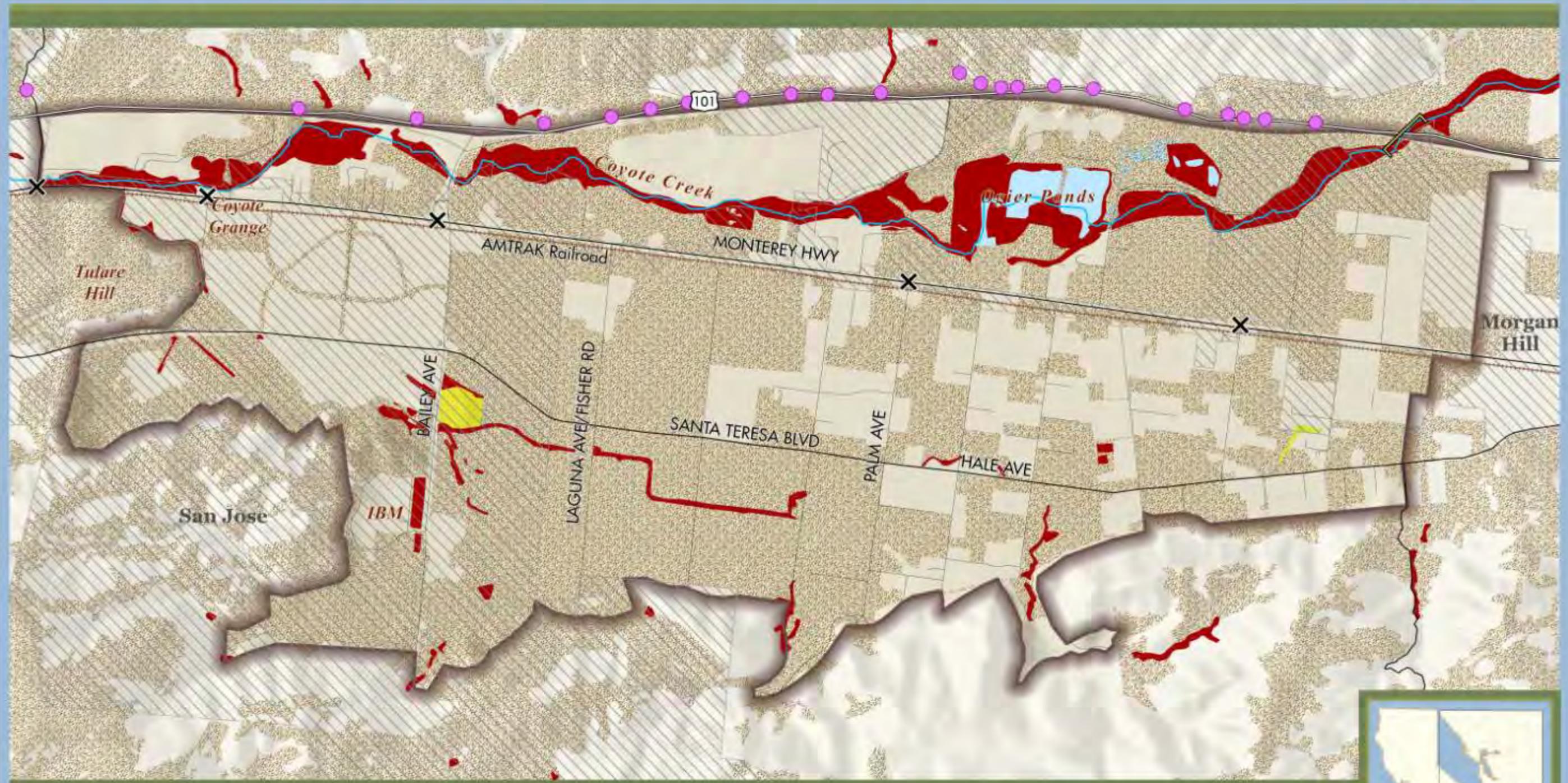
Map produced by Greenleaf
Network using ESRI software.

October 5, 2011



Habitat: Mammals & Birds

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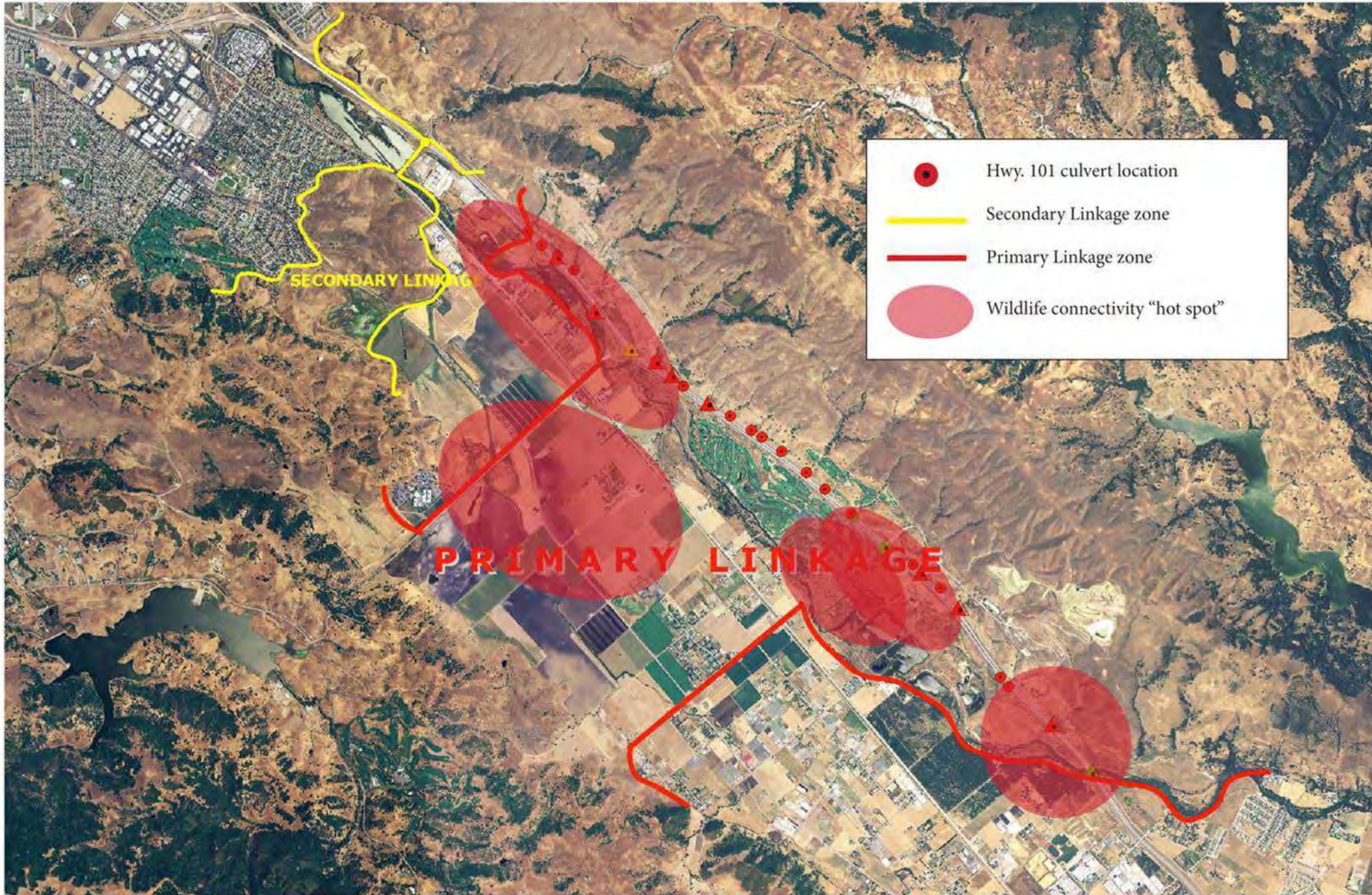


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|------------------------|----------|-----------------|--|---|
| Coyote Valley Boundary | Freeway | Bridges | Least Bell's Vireo (Primary Habitat) | Western Burrowing Owl (Overwintering Habitat) |
| Incorporated Region | Roads | Crossing Points | Golden Eagle (Primary Habitat) | |
| AMTRAK Railroad | Culverts | | Tricolored Blackbird (Primary Habitat) | |

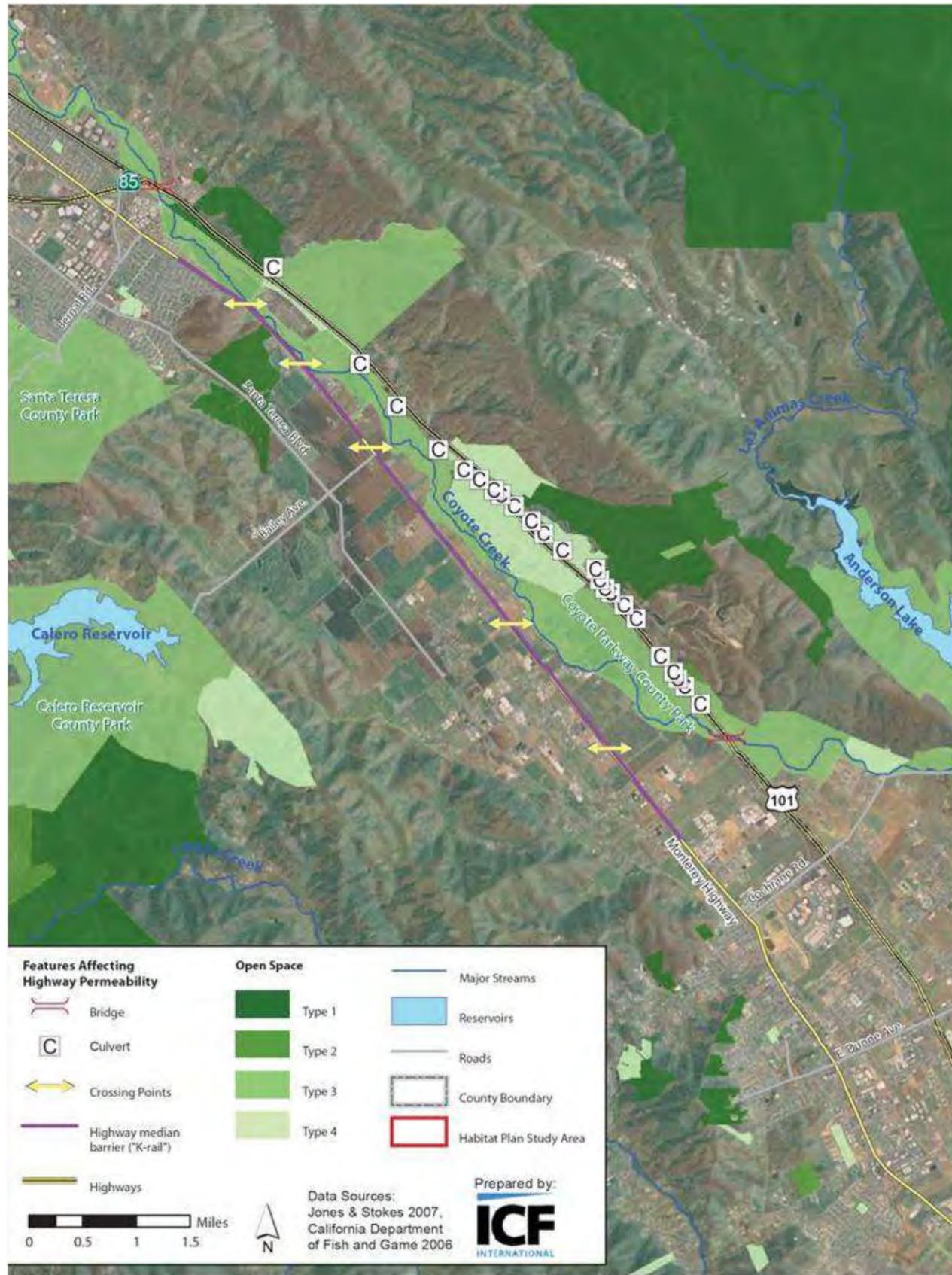
Data Sources:
County of Santa Clara
HCP/NCCP, ICF International
Map produced by Geospatial
Network using GIS software
October 5, 2011



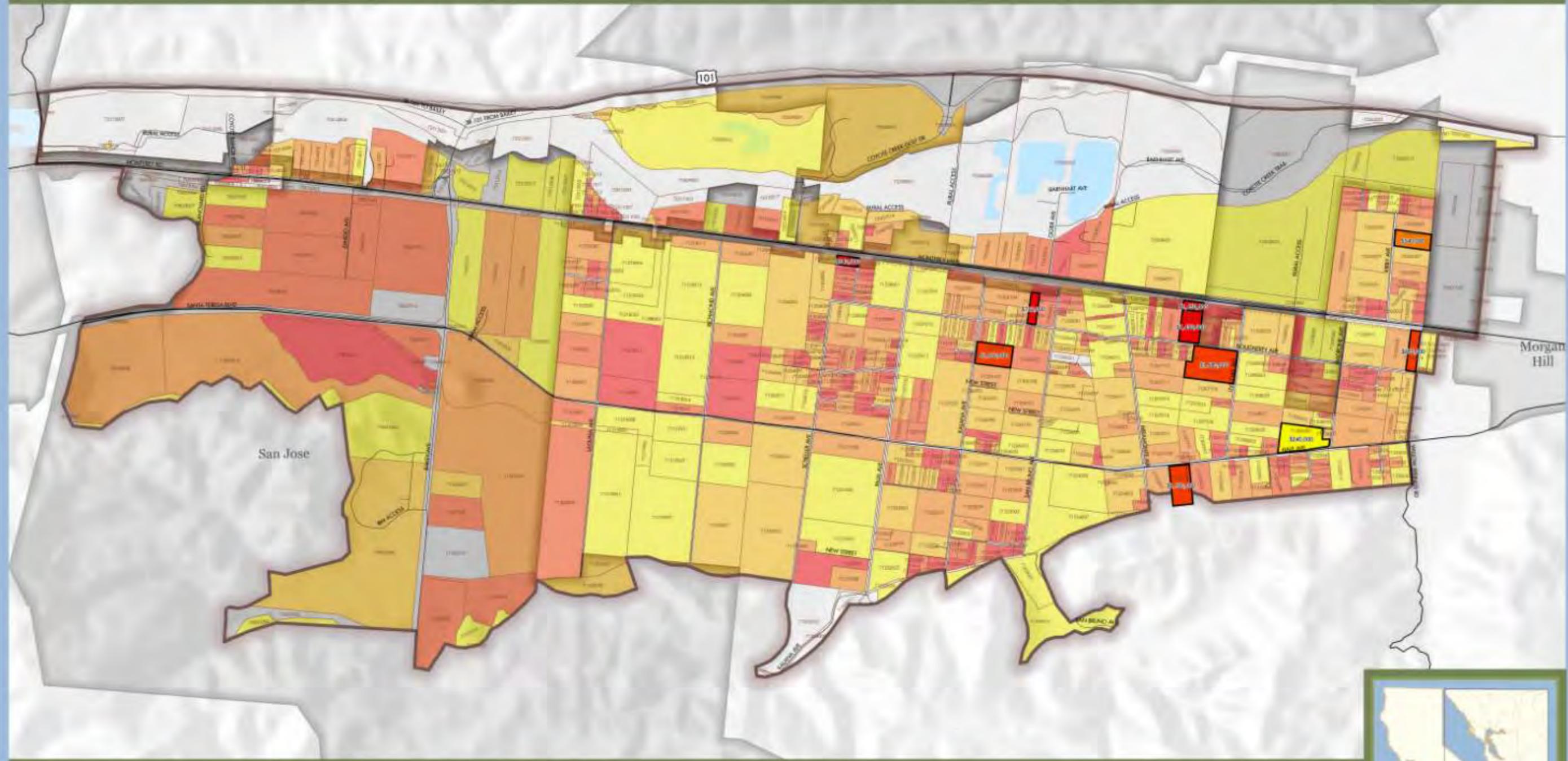
Wildlife Linkage Zones and Hot Spots



Source: DeAnza College: Coyote Valley Landscape Institute
Wildlife Linkages



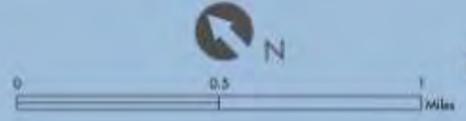
Land Values



Assessed Land Values Per Acre	Parcels	Acres
140,000+	121	395
75,000 - 140,000	117	890
40,000 - 75,000	120	1,188
15,000 - 40,000	129	1,188
0 - 15,000	123	1,832
No Data	97	1,453

Parcels sold since 2004 are outlined and labeled with sale price.

- Freeway
- Roads
- Union Pacific Railroad
- Streams
- Water Bodies

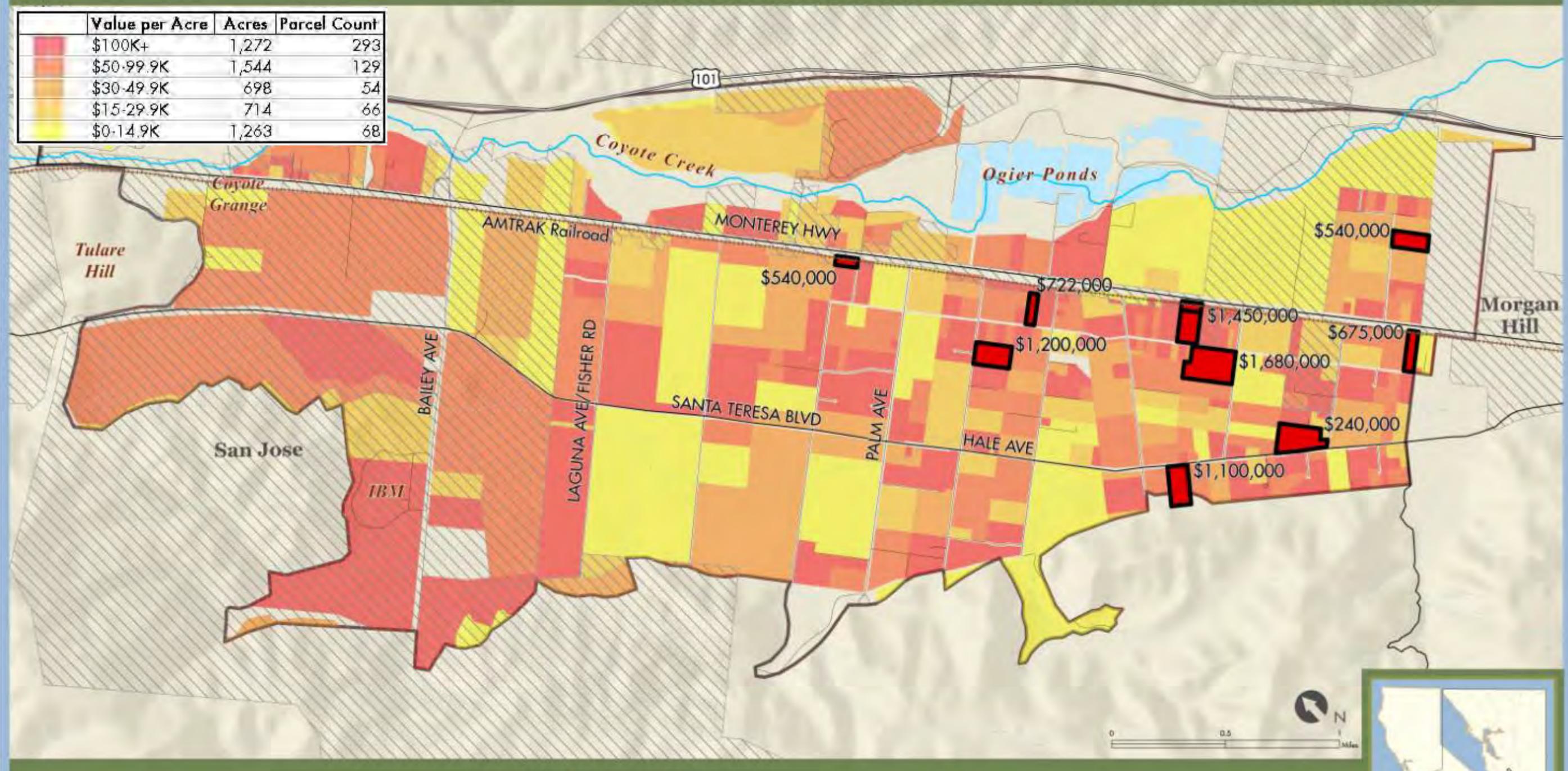


Data Sources:
County of Santa Clara
Map produced by Greenlinks Network using ESRI software
October 5, 2011



Land + Improvement Values

	Value per Acre	Acres	Parcel Count
	\$100K+	1,272	293
	\$50-99.9K	1,544	129
	\$30-49.9K	698	54
	\$15-29.9K	714	66
	\$0-14.9K	1,263	68



Assessed Land + Improvement Values Per Acre

100K+	30-49.9K	0-14.9K
50-99.9K	15-29.9K	No Data

Parcels sold since 2004 are outlined and labeled with sale price.

Legend:

- Coyote Valley Boundary
- Incorporated Region
- Freeway
- Roads
- AMTRAK Railroad

Data Sources:
County of Santa Clara
Map produced by GreenInfo Network using ESRI software.
October 5, 2011