

# CHAPTER 3 Wildlands and Natural Areas

## Goal and Guiding Principles

**GOAL: Protect and manage an interconnected system of wildlands and natural areas to support native habitats and species and to ensure resilience to a changing environment.**

### GUIDING PRINCIPLES:

- Protect and restore habitat for Santa Clara County’s rare and unique biological communities and species.
- Protect and manage large, interconnected habitats and landscape linkages to preserve the full range of biological systems and ensure their long-term viability in response to a changing climate.
- Provide leadership and foster collaborative land stewardship in Santa Clara County, on both public and private lands.
- Conduct outreach and education efforts to better inform the public about local species, habitats, and linkages and the importance of their protection.



Derek Neumann

The Bay Checkerspot butterfly is one of 24 species in the County listed as threatened or endangered.

Encompassing large portions of the Santa Cruz Mountains and the Diablo Range, Santa Clara County’s wildlands and natural areas support an incredible array of natural communities and diverse habitats for plants and wildlife (**Figure 3**).

Native grasslands, oak woodlands, and riparian forests are among the many natural communities that the Open Space Authority has worked to preserve. There is a tremendous amount of work still to be done to protect the long-term integrity of the region’s most important wildlands. Indeed, as a result of the extensive development and urbanization that has occurred in the County, there are an estimated 147 special-status species that have dramatically declined in distribution and abundance, and 24 of these are considered threatened or endangered (County of Santa Clara, *et al.* 2012).

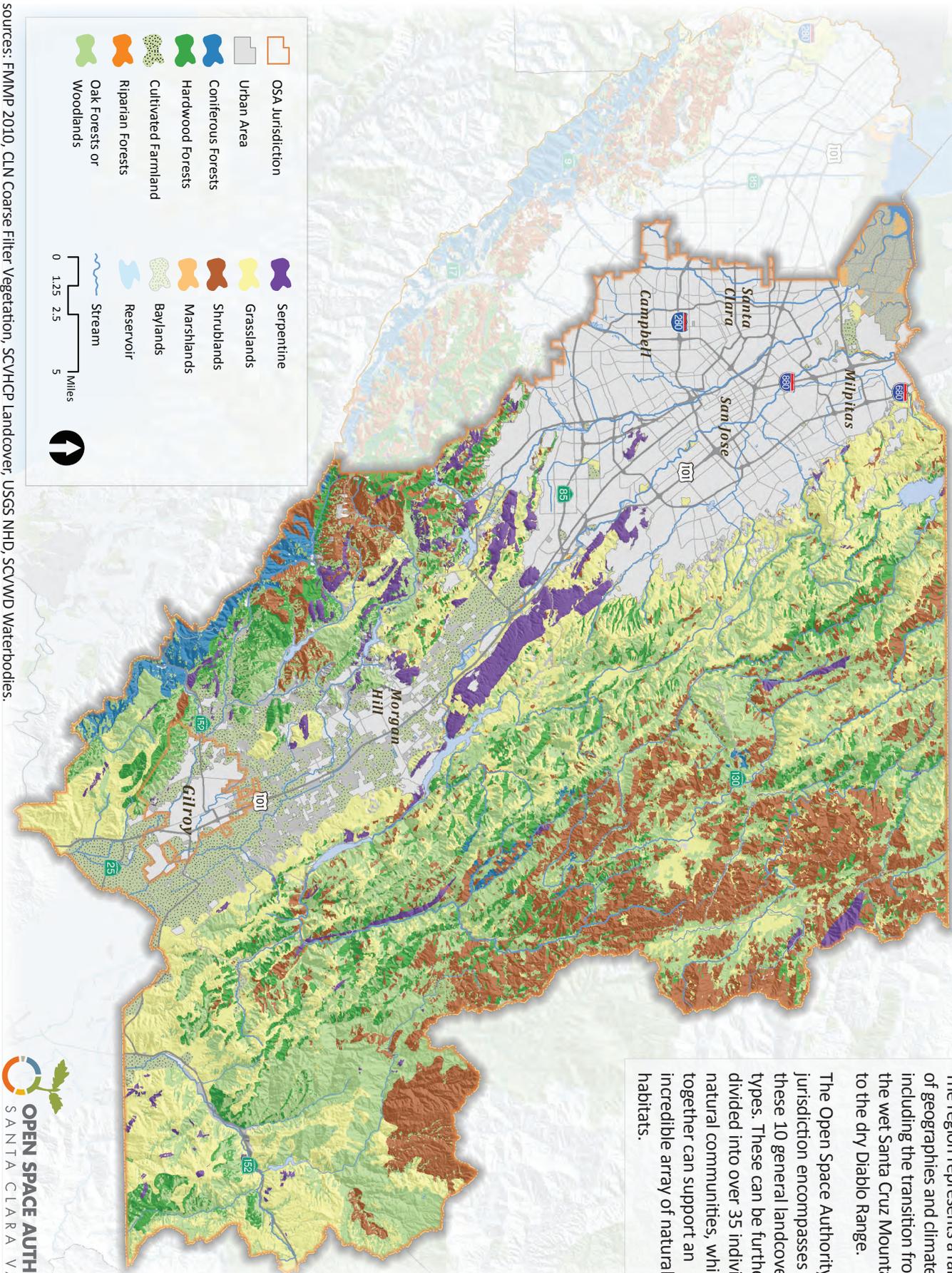
*There is a tremendous amount of work still to be done to protect the long-term integrity of the region’s most important wildlands and the 147 special-status species they support.*



Open Space Authority wildlife cam

An interconnected system of open space is required to support habitat for wild-ranging species.

**Figure 3: Land Cover**



The region represents a range of geographies and climates, including the transition from the wet Santa Cruz Mountains to the dry Diablo Range.

The Open Space Authority's jurisdiction encompasses these 10 general landcover types. These can be further divided into over 35 individual natural communities, which together can support an incredible array of natural habitats.

|  |                          |  |            |
|--|--------------------------|--|------------|
|  | OSA Jurisdiction         |  | Serpentine |
|  | Urban Area               |  | Grasslands |
|  | Coniferous Forests       |  | Shrublands |
|  | Hardwood Forests         |  | Marshlands |
|  | Cultivated Farmland      |  | Baylands   |
|  | Riparian Forests         |  | Reservoir  |
|  | Oak Forests or Woodlands |  | Stream     |

Data sources: FMMP 2010, CLN Coarse Filter Vegetation, SCVHCP Landcover, USGS NHD, SCVWD Waterbodies.

## Important Areas for Wildlands and Natural Areas Conservation

To date the Authority has protected nearly 16,000 acres of open space, water resources, farms, and rangelands; it will continue to focus on protecting and managing important natural areas to protect habitats, critical linkages, and the species they support. To identify where open space protection will be most effective, the *Valley Greenprint* team compiled a wealth of information and spatial data regarding regional distribution of species and habitats, as well as input from numerous species experts. The *Valley Greenprint's* conservation priorities for Wildlands and Natural Areas include protecting locally rare natural communities and habitat for rare, threatened and endangered species; important streams and riparian areas; regionally significant landscape linkages for wildlife movement; and areas with a high level of environmental variability and attributes that may provide resilience to climate change.

### Rare Natural Communities and Habitats

Building on the work of the Bay Area Open Space Council's *Conservation Lands Network* – a collaborative scientific process to identify the types and location of habitats needed to sustain diverse and healthy communities of plant, fish, and wildlife species – the Authority identified locally rare natural communities and habitats (BAOSC 2011), shown in **Table 1**. These habitats are naturally limited in distribution or have become locally rare due to widespread development. These habitats tend to support the region's rarest plant and animal species. Including these areas in a land protection strategy will help ensure that all of the region's diverse habitats are represented in a well-managed network of protected lands, and will help curb local species extinction.



Stephen Joseph

Atop Alum Rock Park, the Open Space Authority's Sierra Vista Open Space Preserve comprises oak woodlands, grasslands, and chaparral, and provides visitors with access to over 10 miles of trails..

**Table 1: Protection of vegetation types within the Authority's jurisdiction.**

| Vegetation types        |   | Total acres | Acres protected | % protected |
|-------------------------|---|-------------|-----------------|-------------|
| Barren / Rock           |   |             |                 |             |
|                         | Barren / Rock                               | 371         | 83              | 22%         |
| Coniferous Forests      |   |             |                 |             |
| *                       | Coulter Pine Forest                         | 198         | 0               | 0           |
|                         | Douglas Fir Forest                          | 35          | 12              | 35%         |
| *                       | Knobcone Pine Forest                        | 4           | <1              | 3%          |
|                         | Ponderosa Pine Forest (non-maritime)        | 956         | 860             | 90%         |
|                         | Redwood Forest                              | 7,283       | 2,608           | 36%         |
| Grasslands              |   |             |                 |             |
| *                       | Coastal Terrace Prairie                     | 100         | 7               | 7%          |
|                         | Grasslands                                  | 138,666     | 40,689          | 29%         |
| Hardwood Forests        |   |             |                 |             |
|                         | California Bay Forest                       | 8,635       | 4,577           | 53%         |
|                         | Montane Hardwoods                           | 43,158      | 18,532          | 43%         |
| Marshlands              |   |             |                 |             |
|                         | Coastal Salt Marsh / Coastal Brackish Marsh | 1,217       | 1,035           | 85%         |
|                         | Permanent Freshwater Marsh                  | 259         | 118             | 46%         |
| Oak Forests / Woodlands |   |             |                 |             |
| *                       | Black Oak Forest / Woodland                 | 46          | 0               | 0           |
|                         | Blue Oak- Foothill Pine Woodland            | 13,023      | 7,195           | 55%         |
|                         | Blue Oak Forest / Woodland                  | 64,752      | 31,378          | 48%         |
| *                       | Canyon Live Oak Forest                      | 110         | 0               | 0           |
|                         | Coast Live Oak Forest / Woodland            | 99,976      | 38,795          | 39%         |
| *                       | Valley Oak Forest / Woodland                | 2,284       | 908             | 40%         |
| Riparian Forests        |   |             |                 |             |
| *                       | Central Coast Riparian Forests              | 1,717       | 730             | 43%         |
| *                       | Sycamore Alluvial Woodland                  | 6           | 1               | 18%         |
| Serpentine              |   |             |                 |             |
| *                       | Serpentine Barren                           | 40          | 1               | 2%          |
| *                       | Serpentine Conifer                          | 155         | 58              | 37%         |
| *                       | Serpentine Grassland                        | 11,618      | 3,376           | 29%         |
| *                       | Serpentine Hardwoods                        | 6,036       | 2,570           | 43%         |
| *                       | Serpentine Leather-Oak Chaparral            | 1,560       | 428             | 27%         |
| *                       | Serpentine Riparian                         | 75          | 32              | 43%         |
| *                       | Serpentine Scrub                            | 1,054       | 513             | 49%         |
| Shrublands              |   |             |                 |             |
|                         | Chamise Chaparral                           | 40,132      | 16,004          | 40%         |
| *                       | Coastal Scrub                               | 3,371       | 1,047           | 31%         |
|                         | Mixed Chaparral                             | 523         | 423             | 81%         |
|                         | Mixed Montane Chaparral                     | 33,757      | 6,483           | 19%         |
|                         | Semi-Desert Scrub / Desert Scrub            | 18,536      | 7,913           | 43%         |
| Urban / Anthropogenic   |   |             |                 |             |
|                         | Urban                                       | 128,394     | 6,901           | 5%          |
|                         | Rural Residential                           | 15,644      | 686             | 4%          |
|                         | Cultivated Agriculture                      | 37,895      | 2,732           | 7%          |
|                         | Non-Native / Ornamental                     | 78          | 37              | 47%         |
| Water / Reservoir       |   |             |                 |             |
|                         | Water / Reservoir                           | 9,712       | 8,337           | 86%         |

\* denotes globally unique or highest priority locally rare vegetation types



The serpentine grasslands of Coyote Ridge are among the resources the Santa Clara Valley Habitat Plan is designed to help protect.

Several natural vegetation communities within the Authority's jurisdiction are especially rare and will be the targets of focused conservation efforts (**Figure 4**). These include the serpentine grasslands along Coyote Ridge and in the hills west of Coyote Valley. Serpentine grasslands provide essential refugia for a number of rare native plant species that depend on unique serpentine soil conditions, including the Mt. Hamilton thistle, Metcalf Canyon jewelflower, Santa Clara Valley dudleya, and smooth lessingia. Serpentine grasslands support the threatened Bay Checkerspot Butterfly, and offer potential for the population's recovery through westward expansion across Coyote Valley. These species are among those targeted for protection in the *Santa Clara Valley Habitat Plan*, which seeks to mitigate impacts to the County's rarest species through development of a habitat reserve system (see sidebar).

Other important natural communities include pure stands of blue oak and valley oak woodlands. High-quality blue oak woodlands are generally scattered throughout the County on low- to mid-elevation hills, typically on north or northeast-facing slopes, while valley oak woodlands are limited to a few remaining locations in the undeveloped Valley floor in the southeastern portion of the County.

Redwood forest occurs throughout the coastal Bay Area, but in Santa Clara County exists only as a narrow ribbon in the Santa Cruz Mountains. These redwood forests complete an ecological transition from grassland on the Santa Clara Valley floor up through the chaparral scrublands of the east-facing slopes of the Santa Cruz Mountains. They encompass the headwaters of a number of streams that originate in the Santa Cruz Mountains, and form an integral part of a complex landscape that may provide ecological resilience in the face of climate change. Within this area are small isolated patches of knobcone pine, a unique fire-dependent conifer woodland that is very rare throughout the Bay Area.

## Santa Clara Valley Habitat Plan

The *Santa Clara Valley Habitat Plan* provides a framework for the protection of natural resources within a large portion of Santa Clara County, while streamlining the permitting process for development projects (County of Santa Clara *et al.* 2012).

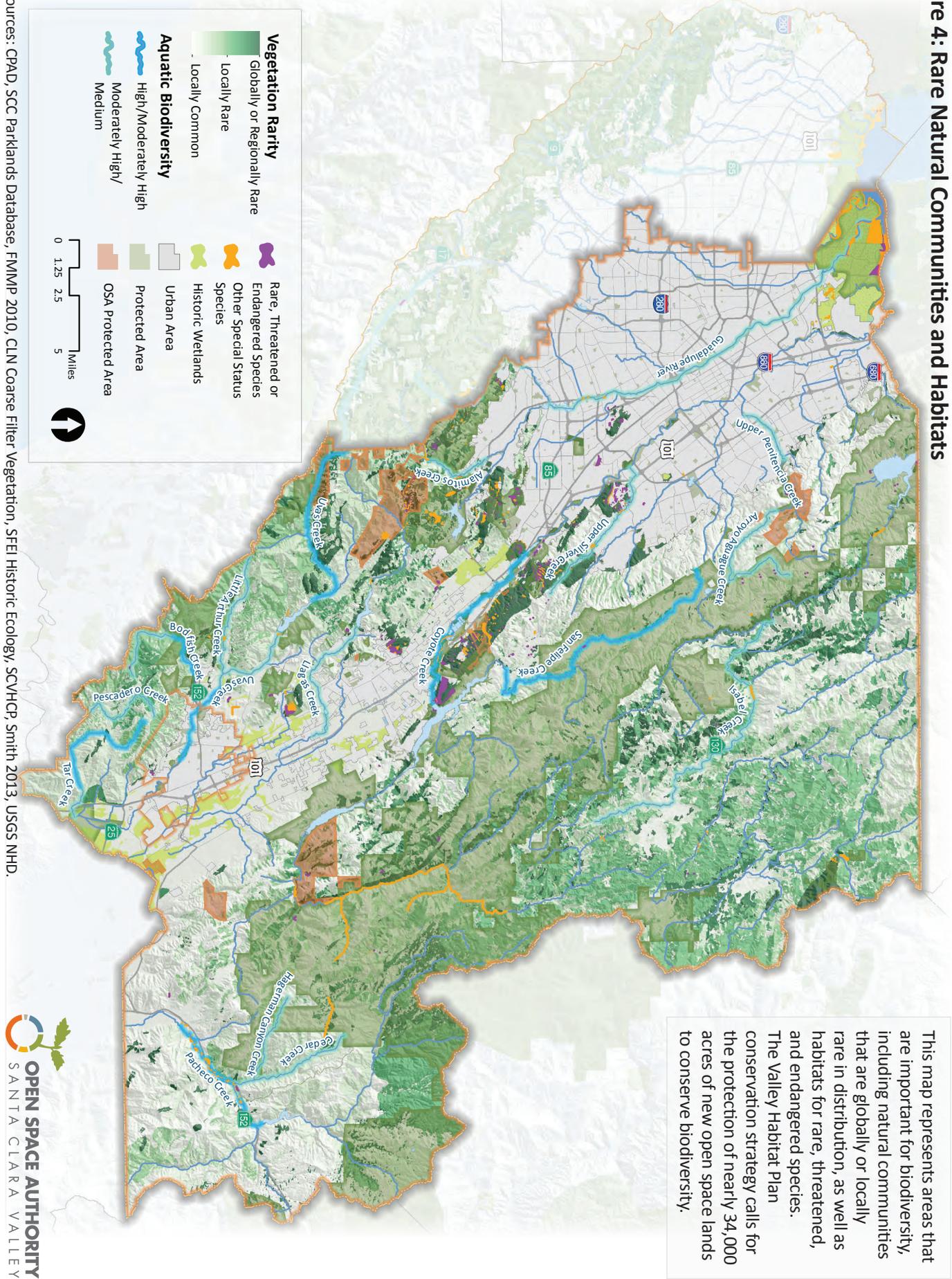
The *Valley Habitat Plan* allows the cities of Gilroy, Morgan Hill, and San Jose, Santa Clara County, the Santa Clara Valley Transportation Authority, and the Santa Clara Valley Water District to receive endangered species "take" permits for their activities and projects. Rather than separately permitting and mitigating individual projects, the Habitat Conservation Plan (HCP) evaluates impacts and mitigation requirements comprehensively, and in ways that are more efficient and effective for at-risk species and their essential habitats.

This will benefit many species, including the famous Bay Checkerspot Butterfly, which can be considered a poster child for serpentine grasslands. Once widespread on the San Francisco Peninsula, the threatened butterfly now hangs on at Coyote Ridge, where its protection will also benefit the many other species endemic to this landscape.

The *Valley Habitat Plan* conservation strategy calls for the protection of nearly 34,000 acres of new open space lands over the next 40 years. These lands would serve as new reserves that are larger and more ecologically valuable than the habitat fragments protected by mitigation of projects on an individual basis.

As a participating special entity, the Open Space Authority helped create the *Valley Habitat Plan*, and will play a key role in the protection, restoration, and management of the resulting reserve system.

**Figure 4: Rare Natural Communities and Habitats**



This map represents areas that are important for biodiversity, including natural communities that are globally or locally rare in distribution, as well as habitats for rare, threatened, and endangered species. The Valley Habitat Plan conservation strategy calls for the protection of nearly 34,000 acres of new open space lands to conserve biodiversity.

Data sources: CPAD, SCC Parklands Database, FMMP 2010, CLN Coarse Filter Vegetation, SFEI Historic Ecology, SCVHCP, Smith 2013, USGS NHD.



Riparian areas are essential not only for wildlife but also for protection of water resources, including aquifer recharge and water quality.

## Aquatic Habitats

Streams, ponds, and wetlands – along with adjacent riparian and upland habitats – are among the most important conservation priorities for the Authority as these areas provide critical habitat for birds, reptiles, and amphibians, as well as a host of other environmental benefits (see **Figure 4**). Within the Authority’s jurisdiction, a number of threatened and endangered species rely upon this important aquatic habitat for all or part of their life cycles, including California Red-legged Frog, Foothill Yellow-legged Frog, Western Pond Turtle, and California Tiger Salamander. Many local streams provide spawning and rearing habitat for steelhead trout, fall-run Chinook salmon, and many other native fish species.

Working with experts including Dr. Jerry Smith (San Jose State University), Jae Abel (Santa Clara Valley Water District), and Jonathan Ambrose (NOAA Fisheries), the Authority took a watershed-based approach to identify important stream and aquatic habitat conservation priorities. Many of these areas include steelhead streams; because of their range and diverse habitat requirements, steelhead are particularly sensitive to habitat loss and modification and serve as a very useful indicator of watershed integrity.

Water quality impacts from sedimentation and other pollutants are a very serious concern, especially in Coyote Creek, Uvas Creek, and the Upper Pajaro River. These waterways will benefit from land conservation and stewardship projects that help restore and maintain water quality and habitat conditions.

- Coyote Creek.** Many areas along Coyote Creek upstream of Metcalf Road are bordered by mixed riparian forests with sycamores on adjacent floodplains, and the stream and its tributary Upper Penitencia Creek provide important steelhead habitat. Upper Penitencia Creek and Upper Silver Creek support native fish populations as well as California Red-legged Frog and California Tiger Salamander. Lower Coyote Creek has been severely impacted by urbanization and the many negative effects of its location below a large dam (poor channel conditions, limited riparian habitat). In-stream habitat enhancement and riparian restoration will be essential to improve fish passage habitat downstream of Anderson Dam.



Protection of riparian habitat is critical for the threatened California Red-legged Frog.

- **San Felipe Creek.** This spring-fed tributary to Anderson Reservoir runs year-round even in drought conditions. While its location above Anderson Dam doesn't support steelhead, native fish including rainbow trout are present, as well as the threatened California Red-legged Frog and the locally rare Foothill Yellow-legged Frog.
- **Upper Pajaro River.** From the mouth of the San Benito River upstream to Llagas Creek and Miller Canal, the Pajaro has a well-developed riparian area. The river provides important habitat and passage for fish, while the surrounding natural areas, farms, and ranches allow for species migration between the Santa Cruz Mountains and the Diablo Range. The Upper Pajaro and Miller Canal run through an important floodplain that includes San Felipe Lake. During winter rains, this lake swells three to four times in size and serves as a critical stop along the Pacific Flyway for migrating and seasonally nesting birds.
- **Uvas Creek.** Below Uvas Reservoir, Uvas Creek and its principal tributaries (Bodfish, Tar, and Little Arthur Creeks) are considered essential for steelhead recovery. Despite severe impacts from the past two decades of rural development, these creeks generally support high-quality riparian vegetation and provide habitat for a number of sensitive plant and animal species. They also provide very important linkages for wildlife movement between the lower and upper watershed. Restoration priorities include erosion and sedimentation control projects, development of off-stream ponds to enhance habitat conditions, and fish passage and barrier removal projects. The watershed above Uvas Reservoir provides exceptional habitat for many native fish including rainbow trout and sculpin, California Red-legged Frog, and potentially Foothill Yellow-legged Frog.
- **Pescadero Creek.** Located on the divide between Santa Clara and Santa Cruz County, Pescadero Creek is in relatively pristine condition, but the relatively dry watershed provides good steelhead spawning and rearing habitat during wet and average rain years, and outstanding wildlife habitat throughout its watershed.
- **Pacheco Creek.** From its confluence with the Pajaro River upstream to Casa de Fruta, the stream flows through closely bordering agricultural crops, and supports a dense but narrow mixed riparian forest of willows, box elder and sycamores. Upstream to the North Fork of Pacheco Reservoir and on the lower South Fork, the creek flows through a broad floodplain with some of the best remaining sycamore alluvial woodland habitat in the county. Cedar Creek and Hagerman Canyon are important tributary streams, providing good upland habitat and good steelhead habitat during years of average and wet rainfall. Water levels in Pacheco Creek are controlled by releases from Pacheco Dam, and dam operations in recent years have led to declines



Stephen Joseph

This pond at Rancho Cañada del Oro Open Space Preserve hosts Western Pond Turtles, a species of special concern.

in the sycamore woodland. However, with proper management the woodland can be restored and flows can be optimized to maintain stable populations of steelhead. The creek serves as a potential north-south wildlife corridor where it crosses beneath Highway 152 at several bridge locations.

## Wetlands

More than 90% of the region's wetlands have been lost to development. Several large wetland complexes are located within the Authority's jurisdiction (see **Figure 4**). They are among the most productive and diverse habitats for native plants and animals in the County, and are important targets for land conservation and habitat restoration.

- **South Bay Salt Ponds.** The south shore of San Francisco Bay is ringed with a series of wetlands and salt ponds that are visited annually by more than 1,000,000 birds migrating along the Pacific Flyway. These wetlands provide outstanding habitat to over 500 plant and animal species, including more than a dozen that are threatened or endangered. The multi-agency South Bay Salt Pond Restoration Project aims to restore 15,100 acres of industrial salt ponds to a rich mosaic of tidal wetlands and other habitats. The largest tidal wetland restoration project on the West Coast, the project will restore vital habitat for endangered species and migrating birds, and will result in a series of improved levees and restored outer marshes that will protect communities from tidal surges and increase the flood carrying capacity of local creeks and flood control channels. Within the Authority's jurisdiction, conservation priorities include wetland restoration and habitat enhancement near the mouth of Coyote Creek where it flows into the Bay, in the vicinity of the San Jose-Santa Clara Water Treatment Plant, and along the lower Guadalupe River west of Milpitas where there may still be opportunities to restore a diverse landscape that transitions from wet meadow saltgrass-alkalai meadow habitat near the shore to an adjacent complex of grassland and vernal pools (Grossinger *et al.* 2006).



Derek Neumann

This Great Blue Heron is one of many birds that rely on the region's wetlands.

- **Laguna Seca.** Located in the western Coyote Valley, Laguna Seca is the County's largest freshwater wetland. In combination with Fisher Creek and the surrounding agricultural fields and upland grassland habitats, this area provides outstanding habitat for migrating and seasonally nesting birds, rare species such as California Tiger Salamander and California Red-legged Frog, and one of the County's largest and most diverse populations of raptors. Laguna Seca was extensively studied as part of the San Francisco Estuary Institute's *Coyote Creek Watershed Historical Ecology Study*, which concluded, "Restoration of Laguna Seca provides an unusual opportunity to restore natural wetland functions and a diverse, large, natural, valley floor wetland. Successful wetland restoration at Laguna Seca could support a wide range of threatened species, including rare plants, amphibians, and water birds." (Grossinger *et al.* 2006) Through a series of small restoration projects along Fisher Creek, establishment of new ponds and swales, and neighborhood-scale infiltration projects, land conservation in this area could also reduce downstream flooding and contribute to local groundwater supplies. This work would also enhance the ability of wildlife to move through the Coyote Valley wildlife linkage between the Santa Cruz Mountains and the Diablo Range.

While many historic wetlands have been drained or modified for agricultural use, they have the best soil and environmental characteristics to support restored wetland and former valley-bottom habitats. Several other important wetland complexes, including the Santa Clara Valley Water District's Carnadero Preserve and Coyote Parkway wetlands, provide exceptional habitat and ongoing opportunities for habitat enhancement or restoration. The Authority will use this information as a guide to identify conservation priorities and to establish specific habitat restoration goals and management objectives for its open space preserves.



As habitat diminishes, connections between remaining habitat patches remain key for migratory animals and those with large home ranges.

## Landscape Linkages

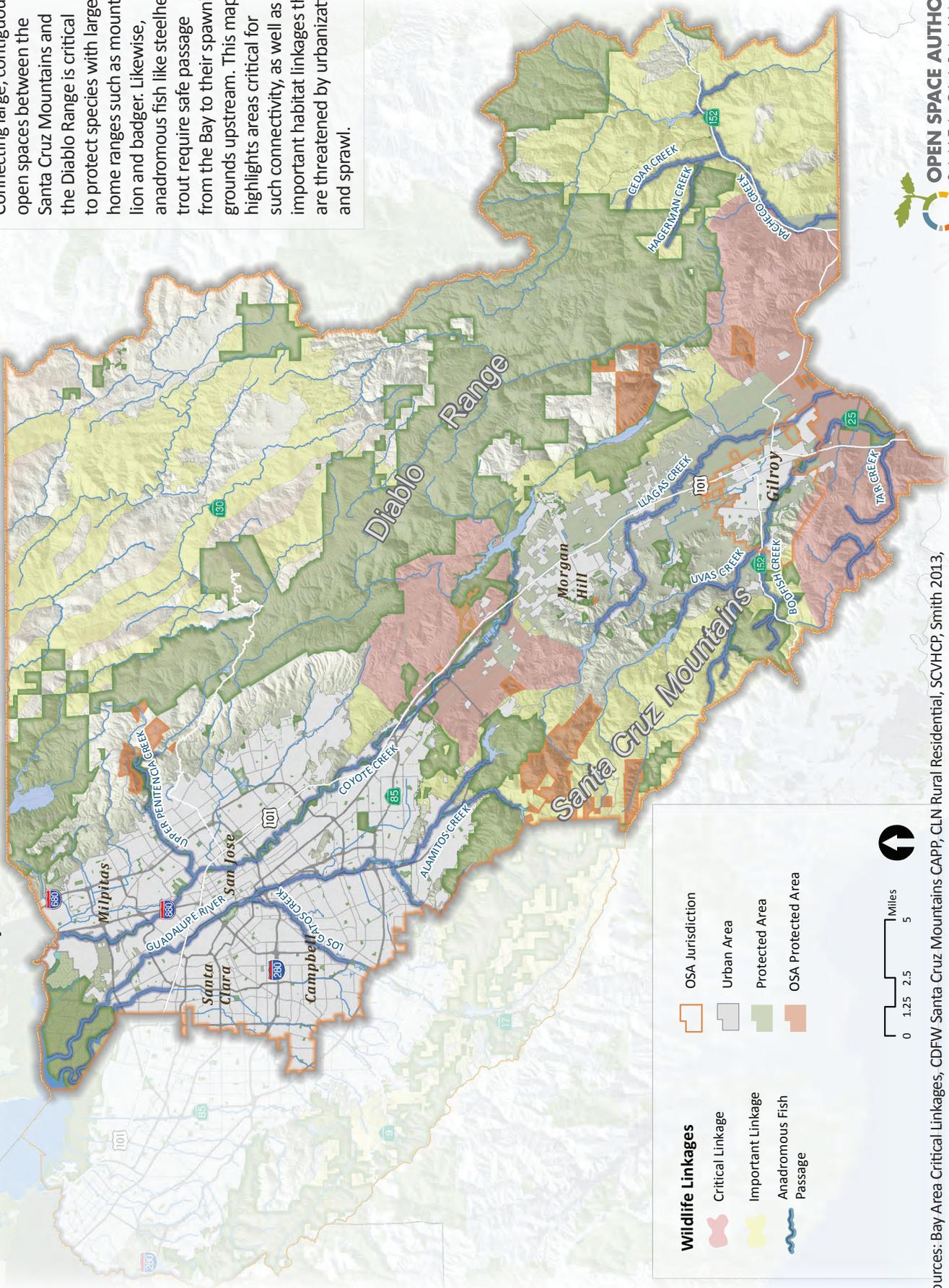
Migratory animals and those with large home ranges require extensive natural areas to provide habitat. Mountain lions are a keystone predator in the region, and their population may be at risk in the long term as their habitat diminishes and populations become more isolated. In areas such as Santa Clara County where development and land costs make large-scale protection challenging, the alternative is to provide habitat corridors, or linkages, that allow species to move between habitat blocks (see **Figure 5**). The essential goal is to retain connectivity between the Santa Cruz Mountains, the Diablo Range, and the Gabilan Range for mountain lion, American badger, bobcat, and other far-ranging species. Planning for wildlife movement and incorporating movement routes into future land use scenarios (see sidebar) is pivotal for protecting these species from local extinction, and will also benefit many other species of plants and animals. Connecting large, contiguous tracts of open space allows movement of wildlife between blocks of habitat and also supports large-scale ecosystem processes such as fire, flooding, and adaptation to climate change.

### Bay Area Critical Linkages Project

An effort to preserve landscape-level process and maintain connected wildlife habitat throughout much of California, the *Critical Linkages: Bay Area & Beyond* project identifies 14 landscape-level connections that form a regional network of interconnected wildlands. Led by Science and Collaboration for Connected Wildlands, *Critical Linkages* is an expansion of work from the Bay Area Open Space Council's *Conservation Lands Network*. It is designed to preserve landscape level ecosystem processes and maintain connected wildlife populations from Mendocino National Forest in the north to the beaches of the Santa Lucia Range on Los Padres National Forest and Hearst Ranch in the south, and eastward to the southern end of the Inner Coast Range. The Open Space Authority is working closely with the California Department of Fish and Wildlife, The Nature Conservancy, and many other partners to protect, restore, and manage land within critical landscape linkages.

**Figure 5: Wildlife Habitat Connectivity**

Connecting large, contiguous open spaces between the Santa Cruz Mountains and the Diablo Range is critical to protect species with large home ranges such as mountain lion and badger. Likewise, anadromous fish like steelhead trout require safe passage from the Bay to their spawning grounds upstream. This map highlights areas critical for such connectivity, as well as important habitat linkages that are threatened by urbanization and sprawl.



Data sources: Bay Area Critical Linkages, CDFW Santa Cruz Mountains CAPP, CLN Rural Residential, SCVHCP, Smith 2013, NHD, CPAD 2013, SCC Parklands Database, FMMP 2010.

Using several excellent assessments of local habitat connectivity, including *Bay Area Critical Linkages*, the *Santa Clara Valley Habitat Plan* (County of Santa Clara *et al.* 2012), and *Safe Passage for Coyote Valley* (Phillips *et al.* 2012), the Authority identified three areas particularly critical for wildlife movement:

- **Coyote Valley**, which provides the northernmost connection between the Santa Cruz Mountains and the Diablo Range. Wildlife movement across the Coyote Valley is challenged by barriers such as Highway 101 and the rail corridor and is severely threatened by planned development projects. The Authority is working closely with the California Department of Fish and Wildlife and several conservation partners on cutting-edge research projects to identify specific land management projects (such as directional fencing and enhanced culverts) to protect and enhance connectivity in the few remaining viable locations across the valley. In many cases, this will require protection of working farms and ranches, either through fee purchase or through a combination of conservation easements and stewardship incentives.
- **Upper Pajaro River**, which provides the southernmost connection between the Santa Cruz Mountains and Diablo Range and also supports a connection between the Santa Cruz Mountains and the Gabilan Range to the south. Protecting a few thousand acres of farms, ranches, and open spaces along the Pajaro will help connect hundreds of thousands of acres of core habitat areas in the surrounding mountain ranges. Maintaining and enhancing connectivity in this landscape is a critical strategy to help plants and animals adapt to changing climate conditions.
- **Eastern Diablo Hills**, which provides a north-south connection between protected lands in Alameda County and Coyote Ridge.

Opportunities to permanently protect these connections are dwindling, and the Open Space Authority is making it a priority to protect, restore, and manage the lands that create these linkages. Both the importance and scale of making these connections will require the Authority to collaborate with a wide range of partners including other land management agencies, transportation and planning agencies, nonprofit conservation groups, private landowners, and others.



William K. Matthias

Working lands and riparian areas can serve as important linkages for wildlife to move through the landscape.

## Climate Change Resilience

Even conservative climate change scenarios predict that the temperature in the Authority's jurisdiction will increase 3.6 to 10.8°F by the end of the century (Ekstrom and Moser 2012), resulting in warmer summers and winters, and earlier spring arrivals. This will alter vegetation patterns; as ecosystems shift, species may be squeezed out of suitable habitat, eventually being lost. Higher temperatures and drier conditions are likely to aggravate the intensity and frequency of wildfires, as well as spread of invasive species (Sandel and Dangremond 2012). These shifts will affect not only natural and urbanized areas, but also the use and management of agricultural lands, including water regimes and availability and crop suitability. Changes in precipitation and rainfall will likely increase both drought and flooding – affecting urban areas, aquatic ecosystems, and water supply (PRBO Conservation Science 2011). Sea level rise and flooding will have significant effects in Santa Clara County, which has some of the highest projected property value losses in the Bay Area region (Heberger *et al.* 2012). Within the Open Space Authority's jurisdiction, much of the urban development is in flood-risk areas that are physically incapable of absorbing change in the natural environment.

Protecting open space is one of the most effective ways for the Authority to mitigate the impacts of climate change and allow adaptation to its effects. The Authority aims to protect large blocks of habitat that will provide more opportunities for species to adapt and shift their ranges in response to increasing temperatures, decreasing precipitation, and more intense storm and fire events. Protection of natural open spaces and working lands can help mitigate climate change by sequestering carbon, one of the primary contributors to global warming (California State Coastal Conservancy 2013).

### Climate-Smart Principles

The principles, developed by the Bay Area Ecosystems Climate Change Consortium (BAECCC), use a nature-based approach to enhance ecosystem services, and allow for humans and wildlife to adapt to climate change.

- Focus goals on future conditions – consider extremes and projections.
- Design actions in ecosystem context – consider ecosystem function, multiple benefits, and broad geographic scope.
- Employ adaptive and flexible approaches – monitor, learn what works, and reassess to adapt to change.
- Prioritize actions – based on science, multiple scenarios, and across species.
- Collaborate and communicate across sectors – partner to learn quickly, solve problems, and share knowledge.
- Practice the 10% rule – spend 10% of your time on creative new approaches.

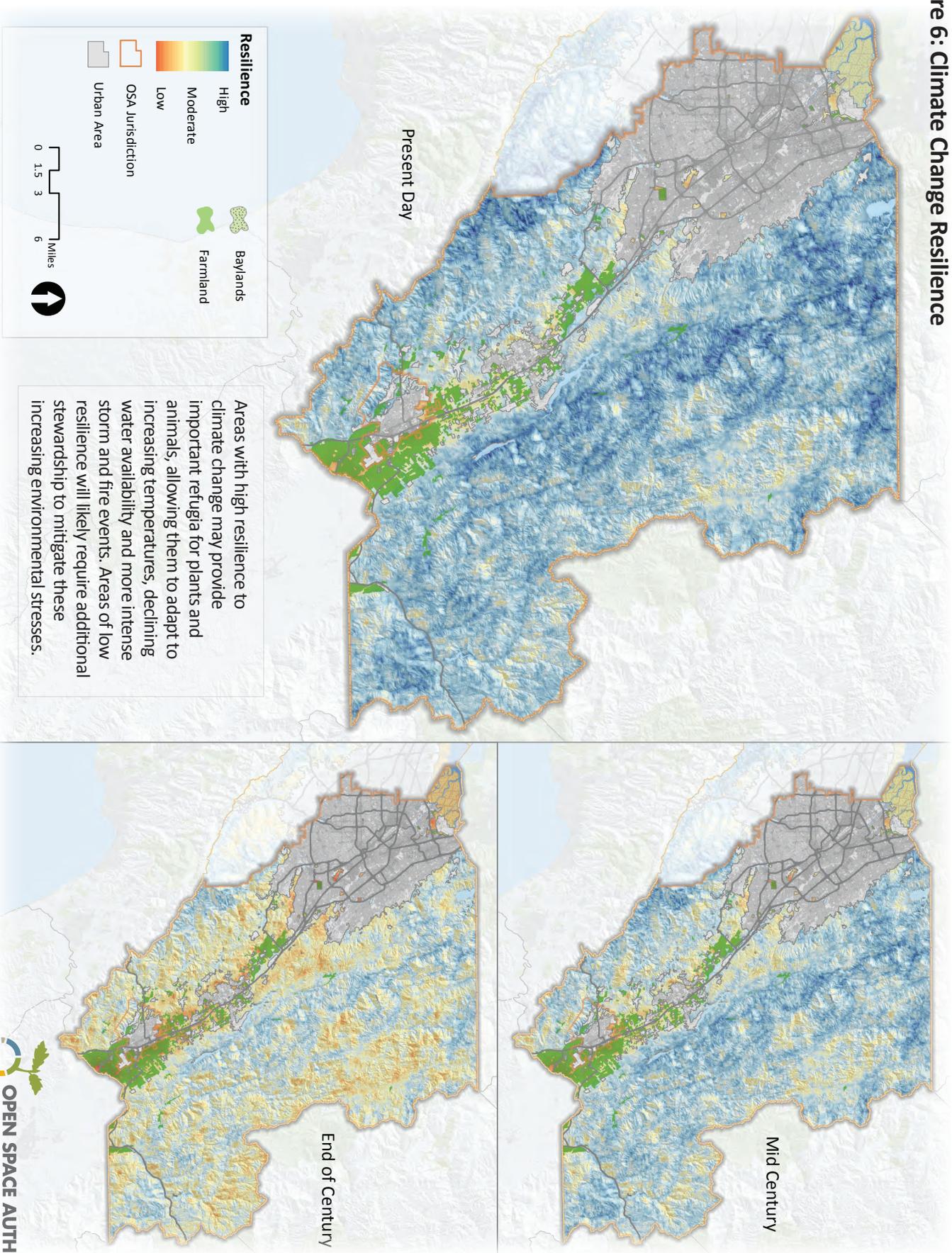
To include climate change impacts in every conservation decision, the Open Space Authority uses Climate-Smart Principles (see sidebar) to guide land protection and management efforts. By protecting large, interconnected landscapes, focusing on water resources, and planning for extremes, the Authority can help build in resilience to help natural and human communities adapt.

**Figure 6** depicts areas that provide ecological resilience to a changing climate, and that may serve as critical climate refugia for plants and animals under changing conditions. These include streams, wetlands, and riparian areas that provide perennial water sources for wildlife; north-facing slopes; and other areas with high environmental and topographic variability where cool local microclimates will persist even when the region is generally getting hotter and drier. Riparian habitats are especially important as they serve as local wildlife corridors that allow plant and animal species to move and adapt as temperatures change, particularly up and down elevation gradients that connect terrestrial and aquatic ecosystems. Many of these areas are located in places that emerged as high priorities for land conservation and stewardship in the

Valley Greenprint (**Figure 2**). Efforts by the Authority and its partners to protect these areas will have an added benefit of ensuring resilience to climate change.

As conditions change toward mid-century and beyond, there will be much greater environmental stress on the landscape, requiring the Authority to increasingly focus resource planning and land management efforts to address climate change. Critical projects include the protection of stock ponds and other water resources that are increasingly at risk, weed management projects (for example, protecting the rare serpentine grasslands at Coyote Ridge from the increased spread of barbed goat grass), and development of interagency coordinated wildfire protection plans.

**Figure 6: Climate Change Resilience**



Data sources: SCCDA Crops Data, FMMP 2010, USGS DEM 90m, TBC3 Cal Basin Characterization Model, SFEI EcoAtlas, the Open Space Authority.

# Strategies for Protecting Wildlands and Natural Areas

Kathy Korbholz



Conservation efforts will focus in part on rare native habitats such as serpentine grasslands.

- 1. Focus land conservation efforts in areas critical for the long-term viability of native species and biological communities and the ecosystem services they provide.**
  - a. Protect and manage biological communities that are rare or endemic to the Bay Area region, including native serpentine grasslands, riparian forests, sycamore alluvial woodland, and land within the boundaries of designated critical habitat for federally-listed species.
  - b. In coordination with the Valley Habitat Agency, pursue grant funding to protect and restore these and other areas identified as high priorities in the *Santa Clara Valley Habitat Plan*.
  - c. Protect, manage, and restore landscapes that are particularly important for ecosystem services such as carbon sequestration and groundwater recharge.
  - d. Engage with the Bay Area Ecosystems Climate Change Consortium and other conservation partners in scenario planning for climate adaptation, with the goal of developing a shared vision for coordinated land conservation and stewardship actions and, ideally, a regional climate adaptation strategy.
  
- 2. Ensure the long-term viability and stewardship of waterways, wetlands, and ponds.**
  - a. Partner with the Santa Clara Valley Water District, Valley Habitat Agency, California State Parks, and Santa Clara County Parks and Recreation, the US Fish and Wildlife Service, the National Marine Fisheries Service, and the California Department of Fish and Wildlife to protect, restore, and manage waterways, riparian areas, wetlands, and ponds. Develop integrated plans to restore habitat for native fish and amphibians while improving water quality and protecting water supplies.
  - b. Protect and manage waterways below reservoirs that support or have the potential to support anadromous fish species such as steelhead and salmon. Integrate fish passage and in-stream habitat restoration projects in an enhanced Urban Open Space Program.
  - c. Model best management practices on Authority lands and demonstrate successful restoration projects.
  
- 3. Protect and maintain connections between large open space parcels to provide large habitat blocks, ensure critical linkages, and provide climate resilience.**
  - a. Coordinate land acquisition plans and funding with partners to ensure a cohesive approach to land protection and connectivity; focus on protecting and managing important landscape linkages identified in regional planning efforts, including Coyote Ridge, Coyote Valley, and the Upper Pajaro River corridor.
  - b. Coordinate with the National Resource Conservation Service, Resource Conservation Districts, the California Rangeland Trust, the cities of San Jose and Morgan Hill, and Santa Clara County to develop and implement strategies that promote wildlife movement through working lands. This could include workshops on management techniques such as fencing, vegetation planting, and managing riparian areas.
  - c. Coordinate with transportation agencies, including the Santa Clara Valley Transportation Authority and CalTrans, on projects to enhance wildlife movement across highways and other barriers.
  - d. Partner with the Santa Clara Valley Water District, Valley Habitat Agency, California State Parks, Santa Clara County Parks and Recreation, The Nature Conservancy, and Midpeninsula Regional Open Space District to expand and connect existing protected areas and create large, resilient open space networks that can accommodate shifting patterns in vegetation and wildlife habitat in response to changing climate conditions.

- e. Prioritize protection and management of natural terrestrial and aquatic areas that can serve as refugia for species facing a changing climate, including areas with microclimate and elevation gradients.
- f. Incorporate climate considerations into the Open Space Authority's management and restoration plans, and employ long-term monitoring and adaptive management to ensure effectiveness under variable conditions.

**4. Provide leadership and resources for land stewardship to promote native species and habitats.**

- a. Participate in local and regional land use planning and policy projects to promote strong local plans that protect open space, biological communities, and species.
- b. Develop comprehensive resource management policies to guide stewardship and resource management activities on Open Space Authority properties.
- c. Further develop the Authority's GIS decision-support tools by creating a comprehensive inventory of natural and cultural resources on Open Space Authority properties, including updated fine-scale mapping of vegetation communities.
- d. Coordinate resource management planning and stewardship with neighboring property owners to develop shared management objectives and leverage financial resources.
- e. Explore development of new funding tools such as payments for ecosystem services and the use of conservation easements and management agreements as incentives to promote stewardship on private lands with important resources.
- f. Provide leadership, work closely with partners, and explore pilot projects to understand and apply these funding tools to protect and restore habitat.
- g. Work with the US Fish and Wildlife Service, California Department of Fish and Wildlife, Natural Resources Conservation Service, local Resource Conservation Districts, local government agencies, and non-governmental organizations to secure funding for habitat improvement projects such as pond maintenance and management of invasive plants and animals.



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The Authority will work closely with partners to coordinate stewardship activities across jurisdictional boundaries.



Partnerships with private and public landowners can support good land management practices that benefit native species and habitats.

- h. Partner with the Natural Resources Conservation Service and Resource Conservation Districts to organize workshops on grazing management, invasive species management, erosion control, and other topics to benefit native species and habitats.
  - i. Support plant nurseries on Authority properties for the propagation of native plants to be used in restoration projects.
  - j. Continue developing the capacity of Authority staff to provide stewardship services on mitigation properties.
- 5. Expand outreach and education programs to increase community awareness of the importance of wildlands and natural resources.**
- a. Participate in a range of community events to promote awareness of the County's native species and habitats.
  - b. Explore partnerships and funding opportunities with schools and local universities to increase environmental education programs and facilitate science-based education and research projects on Authority properties, including partnerships with the San Jose Youth Science Institute, Camp Galileo, and similar programs.
  - c. Provide educational workshops, including visits to Authority properties, for public officials and other decisionmakers to support informed decisions regarding funding and policies that affect open spaces in Santa Clara County.
  - d. Develop educational materials to be available online and at preserve entrances describing the variety of conservation values and ecosystem services provided by the Authority's wildlands and natural areas, including native species and habitats, climate change, habitat connectivity, clean drinking water, crop pollination, flood control, and carbon sequestration.
  - e. Provide ongoing training to Authority volunteers and docents about critical environmental issues for use in interpretive programs.
  - f. Support research projects at all educational levels on Authority properties, and explore opportunities to expand the Authority's iNaturalist program and foster citizen science on Authority preserves.