

Sonoma Developmental Center
Draft Resource Assessment
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1 Introduction



Entrance to Sonoma Developmental Center. Photo by Scott Hess, SLT.

Venturing off Highway 12 near Glen Ellen in Sonoma County, California, you arrive in a small valley reminiscent of another time. At the base of the forested Sonoma Mountain is the Sonoma Development Center (SDC), with its impressive brick buildings, landscaped areas, ball fields and inviting shady spots under grand oak trees that beckon us to take a walk or have a picnic. The Sonoma Developmental Center property is owned by the State of California, and it's easy to assume that the property is not facing any threats of imminent change. The reality is more complicated.

SDC is a State-run residential care facility that has been serving patients with severe developmental disabilities for over 120 years. The developed portions of SDC, including the Core Campus, roads, and surroundings buildings, encompass approximately 25% of the 945-acre property (Exhibit 1). The remaining 700 acres of land stretches across Sonoma Creek up the east slope of the mountain and include redwood forests, oak woodlands, grasslands rich in remnant native species, wetlands and lakes, and a lush riparian corridor. The property is home to threatened steelhead, endangered California freshwater shrimp, bobcats, mountain lions, and a suite of other wildlife species.

The Sonoma Developmental Center encompasses 945 acres. Approximately 245 acres on the property is developed. The remaining 700 acres include open space and undeveloped lands, refereed herein as SDC or the property.

The open space and habitat lands on the SDC property are essential to connecting large blocks of habitat in the southern Mayacamas Mountains to those on Sonoma Mountain and along the Marin Coast. SDC sits at the western slope of a three-quarter mile wide, five mile long

habitat connector between Sonoma Mountain and the Mayacamas Range. This habitat linkage between the eastern and western slopes of the Sonoma Valley is also the most vulnerable "pinch point" in the 85-mile long Blue Ridge-Marin Coast wildlife corridor identified by the Bay Area Critical Linkages Project. Connected habitats are vital for the survival of animals with large ranges, but they also allow many other wildlife species and plants to make subtle adjustments in response to changing climate conditions.

The resident-patient population of the facility has been steadily declining for the past several decades, and the future of SDC is at a crossroads. In January 2014, the State issued a special task force report entitled the "Plan for the Future of Developmental Centers in California." The report details the State's intention to "fundamentally transform" its role in operating developmental centers (DCs) within the next few years (California Health and Human Services Agency, 2015). What transformation means is not yet clear, but the report's conclusion is: "The DCs will need to transition from large congregate 24-hour nursing and Intermediate Care Facility services to a new model."

SDC has the capacity to serve a broad array of health, economic, social, environmental, recreational, and aesthetic needs for Sonoma County and the North Bay region. The opportunity for cost-effective land conservation at SDC is innovative: because the property is in State ownership, it is legally possible to transfer the open-space, watershed and habitat lands to State and local parks for conservation, stewardship, management and public use at little to no cost.

If the State were to sell the SDC property without safeguards in place to protect this critical land, the property would be extremely vulnerable to development, and the opportunity to ensure wildlife passage, habitat connectivity, and public recreation would be lost. In light of this possibility, Sonoma County agencies, community groups, and concerned citizens formed the Sonoma Developmental Center Coalition (SDC Coalition) in 2012 in order to serve as an organized voice for the local community's vision for the future of the residents, employees, and the natural resource assets of SDC. The SDC Coalition includes local elected officials, the Sonoma County Agricultural Preservation and Open Space District (District), Sonoma County Regional Parks (Regional Parks), the Parent Hospital Association (PHA), and local non-profit conservation groups including Sonoma Land Trust (SLT), Sonoma Ecology Center (SEC), Audubon Canyon Ranch, Sonoma Mountain Preservation, and Valley of the Moon Natural History Association. In October 2013, Coalition members adopted the following vision statement, expressing a common set of goals for the property:

- Retain the Sonoma Developmental Center services on the

property, and explore other complementary and appropriate uses within the footprint of the facilities.

- Advocate for the permanent protection of the open land on the SDC property and the essential services it provides, such as habitat and movement corridors for wildlife, clean and ample drinking water, a place of beauty for us to enjoy, and carbon sequestration, among many others.
- Expand public access and recreation opportunities that are compatible with the protection of the property's conservation values, including the development of trails and connections to existing trails on Sonoma Mountain, and potentially across Sonoma Valley to the complex of protected lands within the Mayacamas Mountains.

Over the last two years, community interest and engagement in the work of the SDC Coalition has continued to expand. In early 2015, the State's Legislative Analyst's Office (LAO) recommended closing SDC within ten years, primarily based on budgetary concerns. Several bills have also been introduced in the California Legislature to close SDC within the next few years. Recognizing that a broader community dialogue on the future of the facility is needed, SLT secured grant funding from the Gordon and Betty Moore Foundation, the Resources Legacy Fund, and private donors to fund the "Transform SDC" Project. Through an open public process involving a diverse range of organizations, State and local agencies, residents and their families, neighbors, and the general public, the goal of the Transform SDC Project is to develop a "transformation plan" that identifies a common vision of the future of SDC, specific recommendations and use options, and ultimately a "preferred alternative" bolstered by a financial viability strategy that will meet the economic requirements of the State of California and other key stakeholders. The Transform SDC Project is expected to take approximately 18 months and is being facilitated by the Center for Collaborative Policy based at CSU Sacramento. The ultimate objective of the Transform SDC Project is the implementation of a natural resource conservation strategy and facility redevelopment plan that will guide the future use of the land, health care, and infrastructure resources of SDC.

Prunuske Chatham, Inc. (PCI) was retained by the District to prepare an assessment of natural, cultural, and recreational resources on the SDC property. The Sonoma Developmental Center Resource Assessment (Resource Assessment) focuses primarily on the undeveloped, open space areas beyond the Core Campus—the approximately 700 acres referred to herein as "SDC" or "property." The Resource Assessment is intended to provide an existing conditions summary that can inform planning efforts such as the Transform SDC Project and guide efforts to protect habitat, wildlife passage, other ecosystem services, and

recreation access.

The Resources Assessment was prepared based on a review of previous studies completed on the property, local and regional reports and monitoring efforts, GIS mapping and analysis, outreach and interviews with individuals familiar with SDC and its regional significance, and assessments of cultural resources, wildlife permeability, and habitat connectivity completed for SLT. It summarizes the following:

- existing natural resource conditions,
- wildlife permeability and habitat connectivity study by UC Berkeley,
- cultural and historical resources, prepared by Tom Origer & Associates,
- water resources, prepared by Sonoma County Water Agency (SCWA),
- preliminary results of a hazardous materials assessment for areas outside the Core Campus, prepared by ECON/West Yost, and
- additional data and input provided by Sonoma Ecology Center.

2 Background



Figure 1. Regional Location Map of Sonoma Developmental Center

Setting

The Sonoma Developmental Center is located within the Sonoma Valley at the northern edge of the unincorporated community of Eldridge and immediately south of the historic town of Glen Ellen in southern Sonoma County. The property comprises approximately 945 acres, including the main property and Camp Via (934.08 acres and 11.42 acres respectively; APNs 054-090-001, 054-150-010, 054-150-005, and 054-150-013). Camp Via is an in-holding within Jack London State Historic Park (Jack London SHP), located approximately 0.6 miles west of the Core Campus. The SDC property extends from Highway 12, on the valley bottom, west for approximately two miles, reaching about one quarter of the way up the eastern side of Sonoma Mountain. The property is bisected by Arnold Drive, as well as by Sonoma Creek, which both run approximately north-south through the property.

SDC is surrounded by 9,000 acres of protected open space and parkland that has been assembled over the past few decades (Exhibit 1). Public and private investment of funds in this area affirms its extraordinary resources and recognizes what its loss would mean to Sonoma County and people of California were it to be further developed. SDC represents the largest and most ecologically significant unprotected property in the Sonoma Valley.

SDC is uniquely situated along the lower slopes of Sonoma Mountain and the adjacent flats of the Valley of the Moon. The Valley of the Moon is the northwestern portion of the Sonoma Valley, which lies between Sonoma Mountain to the west and the Mayacamas Mountains to the east. The Sonoma Valley extends from Santa Rosa in the northwest to San Pablo Bay at its southern end. It supports a variety of land uses including agriculture, public parks, and suburban and urban development. Sonoma Valley is considered the birthplace of the California wine industry and it supports nearly one million visitors per year. Highway 12 and Arnold Drive are the major thoroughfares through the valley and are designated scenic corridors.

Sonoma Mountain, along the western edge of the valley and the western edge of SDC, is a prominent landscape feature in southeastern Sonoma County, extending approximately 20 miles from the bay to Santa Rosa. The Mayacamas Mountains on the eastern edge of the valley, across from SDC, forms the boundary between Sonoma and Napa Counties. This range extends from southern Mendocino County in a northwest-southeasterly direction for approximately 52 miles to southern Sonoma County.

SDC is part of the Sonoma Creek watershed, which encompasses 170 square miles throughout the Sonoma Valley. The creek flows for 31 miles from the north end of Sonoma Valley near Pythian Road, collecting water from the streams and ridge tops to the west and east, and drains to the south into San Pablo Bay. Its major tributaries include Calabazas, Stuart, Graham, Asbury, and Bear Creeks. Sonoma Creek bisects SDC and Asbury Creek forms its northern boundary. The smaller Hill Creek runs through SDC and drains the southern edge of the property.

SDC supports oak woodlands, mixed evergreen forests, riparian woodlands, grasslands, and wetlands. Many of these habitats are contiguous with adjacent natural habitats of the eastern Sonoma Mountains and Sonoma Valley. The forests of SDC's upper elevations are part of an extensive swath of forest extending to the north and south. SDC's oak woodlands are part of one of the largest core oak woodlands entirely within Sonoma County, as identified by the District (Gray & Merenlender, draft 2015). Riparian woodland along Sonoma Creek continues upstream and downstream of SDC. However, the habitats on many of these adjacent lands are not protected. Agricultural and residential development have shaped the landscape surrounding SDC, resulting in some fragmentation and loss of habitat quality.

At a larger regional scale, SDC is positioned in a critical linkage corridor for wildlife. The Sonoma Valley Wildlife Corridor (Corridor), running through SDC, encompasses approximately 10,000 acres, and stretches



View of SDC's main campus from Sonoma Valley Regional Park. Photo by Richard Dale, SEC.

from the top of Sonoma Mountain across Sonoma Creek and the valley floor to the Mayacamas Mountains to the east (SLT, 2014) (Exhibit 1). The Corridor is part of a much larger network of linkages connecting habitats in Marin County to those in the Blue Ridge Mountains/Lake Berryessa area in eastern Napa County (Penrod et al., 2013; SLT, 2014). This corridor is a vital connection for wildlife movement within the Bay Area and ensures the region is connected to large undeveloped landscape blocks to the north and south (Penrod et al., 2013).

Adjacent Ownership and Land Uses

There is a range of both private and public lands adjacent to SDC. Private lands adjacent to SDC include rural residential parcels, mostly ranging from 4 to 10 acres in size; vineyards; and the town of Eldridge. Native woodlands and forests are still present on many of the rural residential lands. SDC is surrounded by protected open space and agricultural lands to the east and west and throughout the valley. The small town of Eldridge is immediately to the south, and rural private lands are to the north and south.

Jack London State Historic Park is adjacent to SDC to the northwest, and surrounds Camp Via. The park was established in 1959 in honor of acclaimed author Jack London. It encompasses approximately 1,500 acres, reaches nearly to the top of Sonoma Mountain, and contains the headwaters of Asbury and Hill Creeks, which both run through SDC, as well as the headwaters of Graham Creek. Jack London SHP includes 26 miles of trails, a museum, historic buildings, historic ranch facilities, and

the grave site of Jack London. It supports a range of native plant communities, from grassy meadows and oak woodlands to dense forests of Douglas-fir. The park is also known to support special-status northern spotted owl.

Sonoma Valley Regional Park (SVRP) is adjacent to SDC's northeastern border and is owned and operated by Regional Parks. This 162-acre park has a paved trail running the length of the park, east-west between Highway 12 and Arnold Drive. Several unpaved trails lead from this main trail onto the SDC property. The park supports extensive oak woodland habitat. The one-acre Elizabeth Anne Perrone Dog Park is located near the entrance, adjacent to Highway 12. In 2007, a 41-acre parcel (located at 14400 Sonoma Highway) was purchased by the District and then conveyed to the County and added to SVRP (District, 2007). The District retains a conservation easement over the parcel to preserve its open space, and natural and scenic values. The 29-acre Curreri parcel, along the park's northern border, was recently purchased by Sonoma Land Trust and the District. This property is protected with a District conservation easement and has been incorporated into SVRP.

The 820-acre North Sonoma Mountain Regional Park and Open Space Preserve, owned by Regional Parks, was purchased and protected by the District. These lands are adjacent to Jack London SHP's western border and Fairfield Osborne Preserve. The property provides hiking trails that connect to SDC to the 550-mile Bay Area Ridge Trail. The District-held conservation easement protects the scenic, natural, recreational, educational, and agricultural resources of the property.

In addition, Regional Parks owns the 23-acre parcel Bouverie Wildflower Preserve immediately east of SDC and SVRP, on the east side of Highway 12, on the southern border of Audubon Canyon Ranch's Bouverie Preserve. David Bouverie donated the property to Regional Parks to provide wildflower viewing. However, deed restrictions prevent trail development on the property.

Bouverie Preserve is a 535-acre preserve of the Audubon Canyon Ranch. It lies to the north of SDC, on the east side of Highway 12, immediately across from SVRP. Audubon Canyon Ranch is a non-profit environmental conservation and education organization. Bouverie Preserve hosts on-site education programs for elementary school students and the public, and conducts conservation science and habitat restoration programs focusing on grasslands, vernal pools, wildflower fields, and amphibians.

Sonoma Land Trust owns a number of lands in the vicinity of SDC. Glen Oaks Ranch (234 acres) lies directly north of Bouverie Preserve, and Secret Pasture (300 acres) borders the Bouverie Preserve's southeast side. These properties protect important wildlife habitats, valley oak

habitat, and historic structures. Stuart Creek Hill (14 acres) and several others nearby, smaller parcels along Stuart Creek are just north of SVRP and were protected for their value as steelhead habitat and wildlife corridors.

SLT also holds conservation easements on Oak Hill Farm (677 acres) and Old Hill Ranch (37 acres). Old Hill Ranch is adjacent to SDC to the south and Oak Hill Farm is adjacent to SDC to the east, across Highway 12. These easements are intended to protect agricultural uses of the lands as well as riparian habitat and other wildlands.

The District maintains conservation easements on multiple privately owned properties in SDC'S vicinity on Sonoma Mountain. These include the McCrea (282 acres), Frieberg (203 acres), and the Eliot and Lupine Hill (71 acres) parcels immediately south of Jack London SHP. These properties are protected for their viewsheds, wildlife corridors, and other conservation values.

History of Sonoma Developmental Center

At the time of European settlement, the Sonoma Valley was included in the territory controlled by the Coast Miwok (also known as Southern Moquelumnan). The Miwok were hunter-gatherers who lived in rich environments that allowed for dense populations with complex social structures. They settled in large, permanent villages about which were distributed seasonal camps and task-specific sites. Primary village sites were occupied throughout the year and other sites were visited in order to procure particular resources that were especially abundant or available only during certain seasons. Sites often were situated near fresh water sources and in ecotones where plant life and animal life were diverse and abundant (see *Cultural and Historical Resources* below). (Tom Origer & Associates, 2015)

Historic Overview

In the early 17th century and then again in the late 18th century, Spanish and British explorers sailed the coast of California looking for suitable harbors. Bodega Bay was discovered during this time and the Russians formed settlements at Kuskov and Fort Ross where they began harvesting crops and furs to send back to their Alaskan colonies. The Russians also traded with Spaniards to the south.

It was the Russian interest in the north that spurred the Spanish to explore and settle in the northern region of California, including Sonoma County (Anthropological Studies Center, 2013). General Mariano Guadalupe Vallejo was tasked to push the Russians out of the region



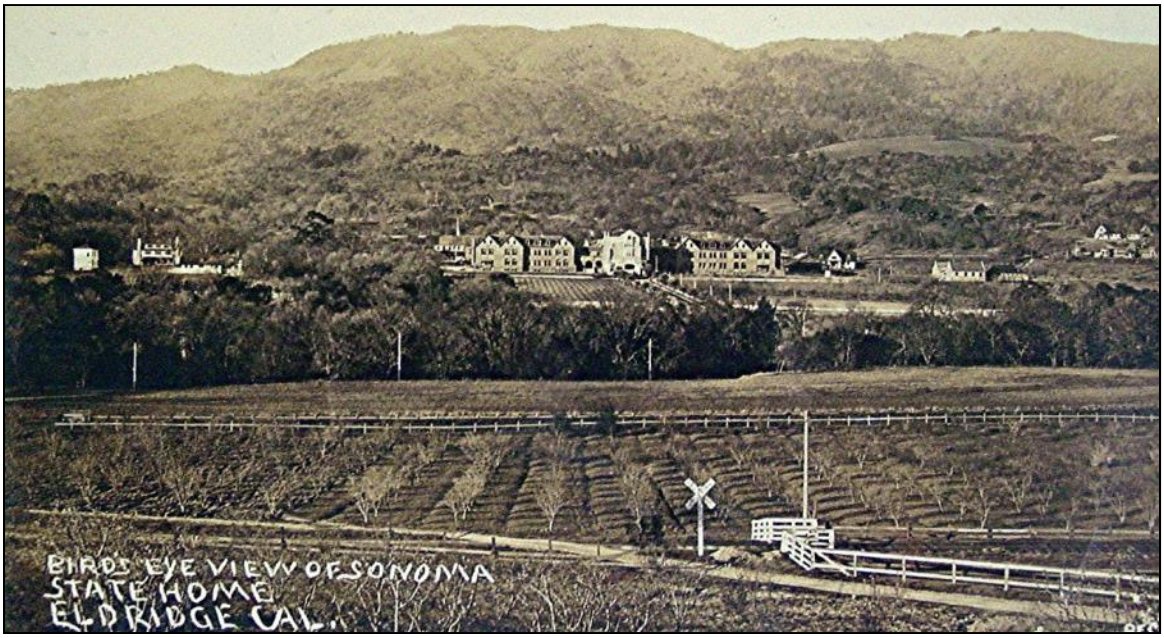
View of the property in 1888. Present day SDC campus occupies vineyard shown in photo. Photo by Carlton Watkins, The Bancroft Library.

north of San Francisco. Spanish settlement hastened when, in 1823, Franciscan missionaries established the northernmost of the 21 California Missions, San Francisco Solano de Sonoma, and then accelerated further when Mexico gained its independence in the mid-19th century.

The Mexican governments encouraged settlement of the new territory known as California by the establishment of large land grants called ranchos. The SDC property includes portions of both the Agua Caliente and the Petaluma ranchos. Both of these properties were granted to Mariano Vallejo. General Land Office plats for the Ranchos (dated 1880 and 1860, respectively) show no development on the property other than two segments of fence slightly east of Arnold Drive.

Ex-Senator William McPherson Hill purchased a ranch in Sonoma Valley at the Eldridge site. In 1854, he moved onto the property and began general farming and horticulture and was one of the first to engage in fruit culture (Kaleta, 2009). He purchased adjoining land until he acquired about 1,800 acres which he continued to farm and ranch. Thompson's 1877 atlas shows the land belonging to Mr. Hill, and depicts a single building and agricultural fields.

In 1890, the State purchased 1,640 acres on the slope of Sonoma Mountain and in the flatlands of Sonoma Valley, in a community called Eldridge from Mr. Hill for $51,000, in order to create a facility for people with developmental disabilities. By the time of the next atlas for the area, the land had been acquired for the construction of the State Home, and six buildings are depicted at that time (Kaleta, 2009).



View of SDC from across Sonoma Creek in 1910. Photo from the Asylum Projects.

In 1883, Julia Judah and Frances Bentley were the driving forces behind the founding of the facility. Both women had developmentally delayed children, and were responsible for forming the California Association for the Care and Training of Feeble Minded Children. Its aim was "to provide and maintain a school and asylum for the feeble-minded, in which they may be trained to usefulness." (DDS, 2015a).

The facility was originally founded as a private institution and was first opened in San Jose, but later moved to White Sulphur Springs near Vallejo. The Vallejo facility opened in May 1884, but it lacked sufficient size and the association realized that more funding was needed as the population of the facility had grown. The association petitioned the California legislature for assistance, and a bill was passed calling for the creation of the California Home for the Care and Training of the Feeble Minded. The new board chose a 51-acre site in the town of Santa Clara to handle twenty residents.

The population of the facility grew from 20 in 1884 to 108 in 1889. With the growth, the Santa Clara home was too small to accommodate the residents, and the legislature appointed a commission and appropriated $170,000 to purchase land, construct facilities and handle commission expenses. The commission included Captain Oliver Eldridge, after whom the community of Eldridge is named. As noted above, the 1,640-acre Eldridge site was purchased from former Senator William McPherson Hill in 1890 (Sonoma Valley Sun, 2013).

The site was deemed ideal as it provided “an ample water supply, drainage, and two railroad lines that passed through the property” (DDS, 2015a). It was also suitable for crops and livestock; it was the

intention that the site would be self-provisioning (Sonoma Valley Sun, 2013). In the early 1900s, the facility was nearly self-sufficient as it supported a dairy, orchard, farm, piggery, poultry house, and vegetable garden tended by both staff and clients (PHA, 2015). The orchard was in production until the 1960s when it could no longer be maintained due to dwindling staff and clients.

Over the years, the facility has undergone many transformations including four name changes. Originally, it was called the California Home for the Care and Training of the Feeble Minded, but its named was changed to Sonoma State Home in 1909, Sonoma State Hospital in 1953, and to its present name in 1985 (LSA, 2001). The facility has also gone through several renovations and two major expansions (DDS, 2015a). Thirteen million dollars was spent to expand the facility in 1948 and another $5 million was spent in 1956. Between 1979 and 1982, the facility was renovated to improve safety, privacy and individualized care. All of the living units were renovated during that time at the cost of about $1 million per building (DDS, 2015a).

In 1969, 162 acres of the Sonoma State Hospital were declared surplus by the State Department of General Services (DGS). According to government code, surplus public lands must be offered to State, County and local agencies prior to sale. After analysis of the park potential of this surplus land by the County, it was determined to be valuable to the County park system. Transfer of ownership of these 162 acres from the State to the County occurred in 1974, with a purchase price of $97,500, 50% of the appraised value. This property has since become Sonoma Valley Regional Park.

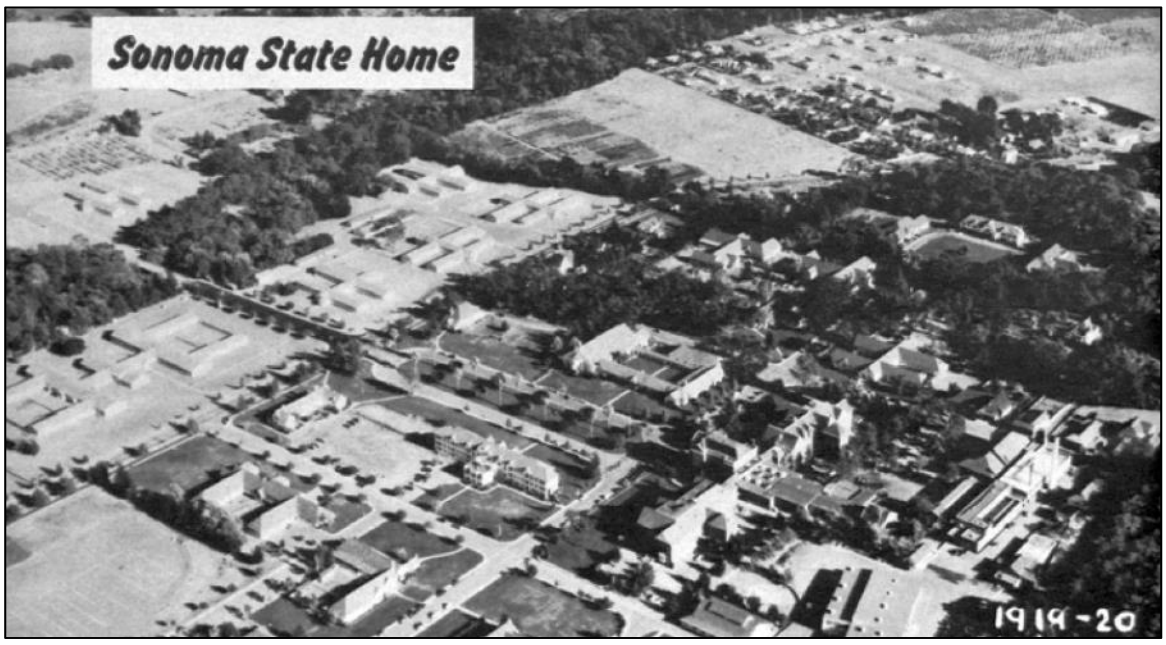
In 1983, the State Legislature declared 41 acres of SDC as surplus. Subsequently, Regional Parks began working with DGS in 1991 to acquire the parcel. The District purchased the property in 2007 for $600,000, which was 50% of the appraised value. The District immediately conveyed the parcel's fee title to the County of Sonoma to be added to SVRP. The District retained a conservation easement over the parcel to preserve its open space, and natural and scenic values.

In 1995, 600 acres of SDC property west and upslope of the main campus, including the forested hillside on the flank of Sonoma Mountain and two former fruit orchards, were declared by DGS to be surplus to the needs of SDC (LSA, 2003). In 1996, following the State's announcement, a local citizens' group, Sonoma Mountain Preservation, with the assistance of then-State Senator Mike Thompson and Assemblywoman Patricia Wiggins, organized the first of several public meetings to discuss the disposition of these lands (Sonoma Mountain Preservation, 2000). Senate Bill 1418 authorized two alternatives for these areas: 1) leasing for agricultural or open space uses, or 2) sale or

exchange to an agency that would hold them as open space or transfer them to Jack London SHP (LSA, 2003). Local support was strong for preserving the parcels in their natural condition and adding them to the park. In 1999, the District purchased a forever wild conservation easement over a 290-acre portion of the property at the full appraised value of $255,000.

In 2000, LSA, an environmental consultant to DGS, undertook a land use feasibility study for the lower historic orchards and adjacent portions of SDC totaling 477 acres. This study assessed whether "there is a feasible agricultural use of this site that would provide an income source to the state while protecting the area's natural environment, its water supply, and the health of the Center's clients and staff, or alternately, if preservation of the site as open space is the best use of the property (LSA, 2003)." Based on the study, and with support from then Assembly members Pat Wiggins and Joe Nation and Senator Wesley Chesbro, DGS recommended transfer of the lands (including the two former orchards and other lands within the Fern Lake watershed) to Jack London SHP, to protect open space values, watershed functions, passive recreational uses, and the health and safety of SDC's clients and staff.

DGS transferred 600 acres, including the 290 acres encumbered by the District's conservation easement, to State Parks in September 2002. The transfer excluded Camp Via, which would continue to serve as an outdoor and recreation facility for SDC. Following the transfer, a celebration of the transfer of the surplus lands to Jack London SHP was held at Camp Via.



Aerial view of the facility from 1919-20. Photo from the Asylum Projects.

3 Significance of Property



Lake Suttonfield.
Photo by SEC.

With its span from mountain slope to floodplain, diversity of habitats, and key location as a wildlife corridor, the Sonoma Developmental Center property is central to sustaining the ecological integrity of Sonoma Valley and the greater North Bay. The property is home to 129 documented bird species and a diversity of amphibians, reptiles, and mammals. Federal and State-threatened northern spotted owls nest in adjacent private lands and Jack London SHP just outside the SDC boundary. The reach of Sonoma Creek flowing through SDC supports federally threatened steelhead, other native fish species, and the endangered California freshwater shrimp. Cameras at SLT wildlife monitoring stations have caught mountain lion, bobcat, and coyote using the SDC property.

The contiguous habitat from Sonoma Mountain through the valley and across Sonoma Creek provides a gradient of habitat types that serves many wildlife species at different times during their life cycles, especially as they adapt to a changing climate. Beyond the span of the property itself, the continuing wildlife linkage stretches westward to the Marin coast and eastward all the way to the Blue Ridge-Berryessa Region.

In addition to its importance for native plant and wildlife species, the property provides stunning views, accessible recreational opportunities, groundwater recharge, moderation of local climate change effects, and

a beautiful and enriching setting for SDC's residents, families, and staff.

Ongoing protection of the property for its open space values supports local, regional, and state-wide mandates to protect open space, water resources and biodiversity, preserve wildlife corridors, link protected lands, and adapt to climate change (see *Contribution to State and Regional Initiatives* below), and would provide multiple educational opportunities.

Biological Diversity and Habitat Connectivity

Sonoma County is recognized as one of the most biologically diverse regions in California and the entire U.S., and SDC supports a cross-section of this diversity (CDFG, 2013; West Coast Watersheds and SEC, 2010). SDC's natural areas include most of the broad vegetation types found in the region. Its riparian woodlands along Sonoma Creek are an important link in an extensive north-south corridor. Its valley- and blue oak-dominated habitats are a precious remnant of historic woodlands now greatly diminished in the Sonoma Valley. Its extensive Oregon oak-dominated woodlands with their largely intact native understories are part of a larger network of oak habitat on Sonoma Mountain's flanks. Its mixed evergreen forests are similarly intact and connected to adjacent habitat. Its grasslands have a strong component of native species, an increasingly rare quality in Sonoma County and throughout California. On SDC, all of these habitats are connected to one another.

This multi-dimensional connectivity is important not only for wildlife movement, but also for sustenance of the plant communities themselves. Connection to adjacent similar habitats supports dispersal, maintenance of microclimate conditions, and habitat quality. Connection to differing habitats at adjacent topographic positions is likely to support resilience to climate change. On the SDC property, there is room for most plant populations—with the potential exception of redwood stands—to shift in elevation. The broad palette of native species present may help maintain the native-dominated character of vegetation as composition shifts over time. And the topographic diversity within habitats on the property may underpin genetic variation within its plant populations—another crucial element of resilience to climate change and other stresses.

Plant communities present on SDC support an abundance and diversity of animals, all with a complex suite of life history requirements. The property itself is large and diverse enough to sustain a wide variety and abundance of wildlife species through part or all of their life cycle. It is perfectly positioned within the landscape so that wildlife can move

Development of SDC and loss of Sonoma Valley Wildlife Corridor pinch point "would jeopardize the future permeability of the Corridor, the integrity of the larger linkage, and the ability of wildlife populations to persist in the region".

(Sonoma Land Trust, 2014)

through it to and from surrounding lands. It provides key habitat for Sonoma County's top carnivores, including mountain lions, coyote, and bobcats with large home ranges, contributes to the genetic diversity that helps build resiliency in regional wildlife populations, and provides habitat for several of Sonoma County's most critically threatened animal species.

The Bay Area Open Space Council's 2011 *Conservation Lands Network* (CLN) effort and the subsequent report *Critical Linkages: The Bay Area and Beyond* (Critical Linkages) recognized the Sonoma Valley Wildlife Corridor (Exhibit 1) and Sonoma, Hill, and Asbury Creeks as priorities for conservation, including the lands of SDC (Bay Area Open Space Council, 2011; Penrod et al., 2013). The CLN has also identified targets for conserving biological assets within the region. Conservation of the natural habitat on SDC land would help meet these targets. For example, protection of SDC's oak woodlands would make a substantial contribution to Oregon oak preservation targets set forth by CLN (SEC, 2015).

Protection of SDC's natural habitat is not just about meeting targets, it is about preserving the biodiversity of the region and allowing plant and wildlife communities room to grow and thrive. A large focus of state and local governments and conservation groups has been to protect the biodiversity of Sonoma Mountain. If the natural areas on SDC were protected in perpetuity, this would add approximately 700 acres of natural areas to the extensive network of land already under protection in the Sonoma Valley. This additional protection would ensure that plant communities and the wildlife that depend on them will continue to make use of SDC's natural areas—from the small treefrogs breeding in shallow wetland patches to the bird species like golden eagle, pileated woodpeckers, and spotted owls that require large areas for survival.

Protection and enhancement of wildlife corridors at local and regional scales is also vital to allowing populations to interbreed and to access larger habitats and food sources. Given the continued development pressure and intense land use within the Sonoma Valley and the larger Bay Area, the Sonoma Valley Wildlife Corridor and Marin Coast–Blue Ridge linkage are critical for moderating some of the adverse ecological effects of habitat fragmentation and loss. This problem is further compounded by threats such as climate change. Natural areas on the SDC property comprise approximately 700 acres of critical linkage habitat for wildlife—equating to roughly 75% of the SDC land (Bay Area Open Space Council, 2013).

The Sonoma Valley Wildlife Corridor measures five miles long from ridgetop to ridgetop and only three-quarters of a mile wide at its

narrowest point (SLT, 2014). This pinch point falls partially within SDC as surrounding areas are developed. The ease at which wildlife move from one habitat to another across the Corridor, referred to as permeability, includes contending with a series of roads, building, undercrossing, and other barriers. Wildlife species are already faced with the hazard of crossing under or over Highway 12 and Arnold Drive as they move through SDC. Further development and loss of habitat within the Corridor would exacerbate that risk.

Ongoing wildlife camera monitoring by SLT show the range of wildlife species we would expect using habitats within the Corridor, including the natural areas on SDC (Nelson , 2015). Mountain lions, for example, have been documented in SDC's portion of the Corridor. This solitary species has one of the largest home ranges of any mammal in North America—somewhere on the order of 100 square miles, depending on habitat conditions and food availability. It needs to be able to migrate across the county to neighboring lands to find a mate, to hunt, and to establish new territories. The importance of natural habitats and movement corridors extends beyond this large carnivore and encompasses the suite of native fish and wildlife that call Sonoma County home.



Moutain lion detected within Sonoma Valley Wildlife Corridor. Photo by SLT.

Groundwater Recharge

Permeable landscape is essential for capturing precipitation and storing it as groundwater. With over 700 acres relatively undeveloped, much of it on gentle slopes, SDC provides an expansive recharge area. Slowly released into streams long after the rainy season ends, groundwater is critical for maintaining sufficient summer flows in Sonoma Creek and its tributaries to support steelhead, riparian habitat, and a host of wildlife that depend on cool, clean, abundant summer water. Groundwater also supplies half of the commercial and residential water demand in Sonoma Valley (SCWA, 2015). The Sonoma County Water Agency's Technical Memorandum "Review of Water Resources for Sonoma Developmental Center" recommends that "care should be taken to limit the potential for any additional groundwater development to impact spring and stream flows at the SDC property" (see Appendix H).

In response to the need to assure sustainable groundwater supplies in Sonoma Valley, SCWA, the Valley of the Moon Water District, and City of Sonoma formed a Basin Advisory Panel to oversee development and implementation of the Sonoma Valley Groundwater Management Plan (SCWA, 2007). Objective BMO-3 of the plan is to "identify and protect groundwater recharge areas and enhance the recharge of groundwater where appropriate." The SDC property is identified as a potential alternative location for groundwater banking (SCWA [2015] citing GEI [2013]).

Climate Change Mitigation and Adaptation

The North Bay Climate Adaptation Initiative (NBCAI) projects that Sonoma, Marin, and Napa counties "should anticipate summer temperatures increasing by approximately 6 to 8°F, on average, in our region by approximately the end of the century…with a likelihood of an increase in the frequency and intensity of extreme events such as droughts and floods" (NBCAI, 2013). These projected changes could result in:

- More need for groundwater and surface water with either smaller total precipitation or extreme, short duration storm events with more runoff and less rainwater infiltration
- Changes in plants and wildlife to species more tolerant of drought conditions and higher temperatures
- Changes in the varieties or types of crops, such as grapes, that can thrive in our area
- Increased fire risk
- Increase in the number of days of flooding

"By providing additional climate diversity over the next century, the land at the SDC site will be of increasing value in the face of predicted climate change."

(Gray & Merenlender, draft 2015)

- Changes in pests and disease vectors due to reduced frost frequency

In its current state as relatively unfragmented open space, SDC has tremendous capacity to contribute to the region's resilience to these projected changes. Foremost is SDC's critical location at the chokepoint within the Sonoma Valley Wildlife Corridor. As described above, animals such as mountain lions and bobcats have large ranges and need to be able to move great distances in order to find mates and food. However, even species with small territories may need to move shorter distances to find cooler temperatures, moister soils, or to follow plant and insect populations as they also adapt to changing conditions.

A recent study of SDC's value for maintaining wildlife connectivity along the Sonoma Valley corridor analyzed expected rates of climate change and the distribution of climates across space to help assess the relative importance of the SDC corridor in climate adaptation (Gray & Merenlender, draft 2015; Appendix F). Because of its topographically diverse habitats, and its connection to more coastal climates, they found that the SDC corridor is likely to be particularly valuable in terms of access to cooler areas, slower rates of change, and greater climatic diversity compared to other similarly sized linkages in the North Bay. They determined that in recent decades (1951-2010), the corridor has provided between 1.52 to 1.59^{o}C cooling during the summer. Based on their modeling of future conditions (2070-2099), the corridor is estimated to provide access to cooler coastal areas that are between 1.02 to 1.06°C cooler in summer. They also determined that the SDC corridor is likely to provide a relative reduction in the velocity of climate change of 0.11 km/year relative to California in general. Also due to its topographic diversity, the SDC corridor will provide important climate diversity, which they measured in terms of climatic water deficit.

Nowhere else in the North Bay is there large undeveloped acreage, already in public hands, that provides so much: a great variety of healthy plant communities, surface water for people and aquatic wildlife, sizable wetlands, habitat for sensitive bird and animal species, recreational opportunities ranging from strenuous hikes connecting with the Bay Area Ridge Trail to easy strolls through meadows to picnic areas, essential linkages for wildlife migration, stunning views, a rich history, proximity to world-class tourism destinations, existing roads and trails, and a community committed to its protection.

(Sonoma Ecology Center, 2015)

As described above, SDC also provides groundwater recharge and purification. Abundant groundwater supplies and dense riparian vegetation can moderate water temperatures in the reaches of stream on the property and create thermal refuges. The plant communities on the property sequester carbon from the atmosphere as well as provide cooler temperatures for heat-stressed animals through shade and evapotranspiration. Were they to be replaced with driveways and buildings, the property's capacity to help wild species adapt to climate change would be significantly diminished while the problem that creates the need would be intensified.

Scenic Beauty and Open Space

The beauty of Sonoma Valley is legendary. The heritage oaks on the valley floor and the undisrupted forested hillsides of Sonoma Mountain

are visible when passing through the property as well as from across the valley. Such views of natural beauty enrich the lives of area residents and the many visitors who come every year to experience a piece of California close to the Bay Area and Sacramento that still maintains its pastoral character of integrated farmland, small towns, and wildlands. The rural landscape of Sonoma Valley attracts millions of visitors annually to the county, which is a vital part of the area's economy, providing jobs for residents and sustaining home values. According to the Sonoma County Economic Development Board, 7.5 million visitors come to Sonoma County annually—and many have Sonoma Valley high on their list of destinations. The Sonoma Valley Visitors Bureau had over 60,000 walk-in visitors in 2013 (EDB, 2013).

The SDC property is a central component of a large swatch of land with minimal development that creates a natural, open landscape integral to the character of the valley and Sonoma County. The boundaries between SDC and the adjacent Jack London State Historic Park and Sonoma Valley Regional Park are invisible, as trees and grasslands grow undisrupted by buildings and roads. From the property itself, residents and visitors get magnificent views and vistas. As seen from Highway 12 and the Calabazas Creek and Montini Open Space Preserves, the SDC property forms a significant portion of the remaining contiguous natural vegetation still visible from across the valley. Drivers, bicyclists and pedestrians passing through the property also enjoy these views of Sonoma Mountain and can savor a taste of an earlier time.

Human Health Benefits, Recreation, and Education

Most people know intrinsically that access to natural open areas makes them feel better. Open access to parklands encourages people to exercise and provides long-term health improvements and reduced health care expenditures (Batker et al., 2014). Recent psychological research suggests that spending time in nature improves cognition, relieves anxiety and depression, and boosts empathy. Studies in Japan have shown that "leisurely forest walks, compared with urban walks, yield a 12.4 percent decrease in the stress hormone cortisol" (Williams, 2015). The diverse outdoor environments of the SDC Core Campus and undeveloped lands provide a wealth of opportunities for various recreational pursuits that positively affect the social, mental, and physical health of the residents and employees as well as the larger community. In addition, the environmental education potential inherent in the property could provide significant enrichment opportunities and long-term positive impacts on how people understand and care for their landscape and its resources.



Hikers utilizing trails on SDC. Photo by Scott Hess, SLT.

For the residents, families, and staff of SDC's health care facilities, the expansive grounds provide serenity and a place for physical activity, a break from their regular routine, and opportunities to discover and connect with the natural world. Residents enjoy the wildlife they can see from their homes and many employees appreciate the readily available respite from work that is often challenging (Sutton, 2015). Over the years, vegetable and flower gardens have given clients opportunities to contribute to their community or to just experience the rich world of colors, smells, and textures that can be difficult for many disabled people to access. Regular rides in an open tram through the property are a highlight for residents as it brings them in touch with many of the property's wildlife species and native habitats (Miller, 2015).

Respondents to a survey of parents and relatives of SDC residents commented on how extremely important they felt the outdoor experience is for their loved one's health and quality of life (SCRP, 2014). The majority of respondents stated that spending time walking or sitting outside was a very important part of their visit to the campus. Even the parents with nonverbal residents were able to describe a positive change in their loved one during these outdoor experiences, such as a more relaxed and peaceful demeanor resulting in improved behavior. The SDC resident parents identified somatosensory experiences (earth under foot, air on face), visual sensory experiences (open, intimate views of specific elements), and auditory experiences of enhancing their experience and quality of life.

For the community at large, SDC has the potential for lasting physical

and mental health benefits as well. SDC provides easily accessible hiking as well as beautiful views while biking or driving along Arnold Drive. Many of the larger publicly accessible natural areas in the region are on slopes averaging 7.5 to 10% (SEC, 2015). SDC's gentler terrain (average slope of 5%) could offer recreation opportunities for a wide range of hiking abilities.

Given that neighboring trails are very popular with hikers, equestrians, and bicyclists, SDC trails would likely receive a similar level of use if available to the public. Sonoma County Regional Parks staff estimate that in fiscal years 2011-2012 and 2012-2013, there were 225,000 and 230,500 visits, respectively, to Sonoma Valley Regional Park and the adjoining SDC property (as cited in SLT, 2014).

The SDC property also provides outstanding educational opportunities, not only because of its central location and accessibility, but also because of its size and unique ecological role. The property provides stellar opportunities to learn about groundwater recharge, how different habitat types work together to support a working ecosystem, the importance of wildlife corridors, and how local actions can have regional impacts.

Additional Ecosystem Services

SDC provides Sonoma County and the region with many additional ecosystem services. Table 3 below categorizes the services and summarizes their benefit to people.

Table 1. Ecosystem Goods and Services

Goods/Services	Economic Benefit to People
PROVISIONING SERVICES	
Food	Producing crops, fish, game, and fruits
Medicinal Resources	Providing traditional medicines, pharmaceuticals, and assay organisms
Ornamental Resources	Providing resources for clothing, jewelry, handicraft, worship, and decoration
Energy and Raw Materials	Providing fuel, fiber, fertilizer, minerals, and energy
Water Supply	Provisioning of surface and groundwater for drinking water, irrigation, and industrial use
REGULATING SERVICES	
Biological Control	Providing pest and disease control
Climate Stability	Supporting a stable climate at global and local levels through carbon sequestration and other processes
Air Quality	Providing clean, breathable air
Moderation of Extreme Events	Preventing and mitigating natural hazards such as floods, hurricanes, fires, and droughts
Pollination	Pollination of wild and domestic plant species
Soil Formation	Creating soils for agricultural and ecosystems integrity; maintenance of soil fertility
Soil Retention	Retaining arable land, slope stability, and coastal integrity
Waste Treatment	Improving soil, water, and air quality by decomposing human and animal waste and removing pollutants
Water Regulation	Providing natural irrigation, drainage, groundwater recharge, river flows, and navigation
SUPPORTING SERVICES	
Habitat and Nursery	Maintaining genetic and biological diversity, the basis for most other ecosystem functions; promoting growth of commercially harvested species
Genetic Resources	Improving crop and livestock resistance to pathogens and pests
CULTURAL SERVICES	
Natural Beauty	Enjoying and appreciating the presence, scenery, sounds, and smells of nature
Cultural and Artistic Inspiration	Using nature as motifs in art, film, folklore, books, cultural symbols, architecture, and media
Recreation and Tourism	Experiencing the natural world and enjoying outdoor activities
Science and Education	Using natural systems for education and scientific research
Spiritual and Historical	Using nature for religious and spiritual purposes

Source: Batker et al. (2014)

4 Contribution to State and Regional Initiatives

As recognition of the urgency to safeguard natural landscapes and critical ecosystem services grows in the face of rapidly changing climate and continuing population pressure, actions that achieve multiple goals are precious opportunities. One action—ongoing protection of the SDC property—addresses many pressing regional, state-wide, and local mandates. The plans and initiatives that carry out these mandates are grouped below by habitat connectivity and climate adaptation, protection of water resources, and trail connectivity. Climate adaptation is coupled with habitat connectivity because preserving and creating movement corridors is identified as an essential strategy in both climate initiatives listed.

Habitat Connectivity and Climate Adaptation

As the critical pinch point in the Sonoma Valley Wildlife Corridor, continued protection of SDC squarely addresses objectives to link habitat blocks. In addition to supporting animals with large ranges, these connections also allow other wildlife species and plant populations to move on a smaller scale as they adjust to changes in moisture and temperature.

Protecting healthy habitat and biodiversity on the SDC property itself also promotes resilience to climate change. Larger populations of plants may be better able to survive pest onslaughts or contain enough genetic diversity that some individuals persist. A variety of plant species available in close proximity allows better-adapted native plants to replace those impacted by climate change instead of weedy invasive species. Healthy upland and riparian habitat also helps to deliver sufficient cool, clean water to SDC's lakes and streams both on the property and downstream. Local aquatic animals, such as steelhead, pond turtles, California freshwater shrimp, and foothill yellow-legged frogs, are especially vulnerable to higher temperatures and low summer streamflows.

> *"The adverse impacts from climate change may pose the single-most serious threat to the long-term sustainability of indigenous fish and wildlife populations."*
>
> (Western Governers' Association, 2008)

The following initiatives and plans focus on wildlife habitat and connectivity. Most call for collaboration and several stress the importance of maintaining existing habitat linkages.

The Western Governors' Initiative on Wildlife Corridors and Crucial Habitat

The Western Governors' Association, consisting of 19 western states and three U.S. flag islands, began an effort in 2007 to identify key wildlife corridors and crucial wildlife habitats and to coordinate implementation of their preservation. The Governors also recognized that climate change is amplifying the urgency for protecting habitat and movement corridors. "As landscapes change due to climate change, these connections between critical habitat areas become even more critical." (Western Governers' Association, 2008). The Western Governors advocate that "management policies must be implemented that support the long-term persistence of species and ecosystem health" in order to prevent significant loss of wildlife.

California's Wildlife Action Plan

California Wildlife: Conservation Challenges, the State's wildlife action plan (SWAP), describes the threats affecting wildlife and their habitats by region and identifies conservation actions to address the threats. One of 11 statewide actions recommended in the SWAP is that State and federal agencies should work with cities and counties to secure sensitive habitats and key habitat linkages (Bunn et al., 2005). Specific recommendations to accomplish this action are:

- State and federal wildlife agencies, working with non-governmental organizations, should inventory and evaluate sensitive wildlife habitat and key habitat linkage areas.
- Public land managers should protect wildlife habitat linkages on public lands.
- Lead planning agencies should incorporate habitat linkages and other identified key habitats into conservation plans. Regional conservation plans should include adaptive management provisions to accommodate protecting important wildlife linkages as they are identified.
- The State should partner with federal and local land managers, land trusts, and conservancies to prioritize and secure, through purchase, swaps, or easements, important habitat linkages and other priority sites that are not now protected.

For the Central Valley and Bay-Delta Region, the WPA recommends that, "Public agencies and private organizations need to collaboratively protect upland linkages and reduce the risk of habitat isolation in the eastern and northern San Francisco Bay area" (Bunn et al., 2005).

California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California, 2010

The California Essential Habitat Connectivity Project, led by the Department of Transportation and the California Department of Fish

and Wildlife (CDFW), presents a broad approach to connect relatively natural habitat blocks throughout the entire state and areas essential for ecological connectivity between the blocks (Spencer et al., 2010). Although the Sonoma Valley Wildlife Corridor is not specifically identified as a link, the Marin coast and the Mayacama Range are shown as natural landscape blocks that should be connected. In addition, since natural areas smaller than 2,000 acres were not considered in the report's analysis, the authors stress the importance of regional analyses to locate additional connections.

CDFW's Vision for Confronting Climate Change in California

In recognition that "climate change is a major challenge to the conservation of California's natural resources," the California Department of Fish and Game (now CDFW) prepared a vision document in 2011, *Unity, Integration, and Action: DFG's Vision for Confronting Climate Change in California* (Vision; CDFG, 2011). This documents sets out a framework for CDFW to work collaboratively with other agencies and partners to better anticipate and respond to the effects of climate change.

Objective 3 of the vision is to create a large-scale, well-connected, sustainable system of conservation areas across the state's terrestrial and marine landscapes. Objective 4 is to Manage for Enhanced Ecosystem Function. The vision states that, "Maintaining and restoring ecosystem function is a cornerstone of natural resource adaptation planning because it is essential for creating healthy ecosystems and ensuring the preservation of important ecosystem services." The vision calls for actions that promote resistance to climate change and promote resilience to allow ecosystems to accommodate gradual changes.

California Climate Adaptation Strategy

The California Climate Adaptation Strategy (CAS) was developed by the California Natural Resources Agency in response to Governor Arnold Schwarzenegger's Executive Order S-13-08. The order called upon state agencies to develop a strategy to identify and prepare for expected climate impacts (California Natural Resources Agency, 2009). The CAS recommends that maintaining natural corridors in anticipation of predicted climate changes should be factored into future local and regional habitat conservation planning efforts.

The California Adaptation Planning Guide was subsequently developed by the Resources Agency and the California Emergency Management Agency in 2012 to help local communities address the unavoidable consequences of climate change. Ongoing protection of the SDC property implements two of the strategies in the Adaptation Planning Guide:

- BH1. Identify and protect locations where native species may

shift or lose habitat due to climate change impacts.

- BH2. Collaborate with agencies managing public lands to identify, develop, or maintain corridors and linkages between undeveloped areas.

Conservation Lands Network, Critical Linkages: Bay Area & Beyond

The Bay Area Open Space Council partnered with 125 agencies and organizations from 2006-2011 to create the Conservation Lands Network (CLN), a regional vision and guide to protect the Bay Area's habitat and rare landscapes. CLN identified lands that are important for conserving biodiversity (Bay Area Open Space Council, 2011). The first CLN progress report notes that "the increased connectivity of protected lands is exponentially powerful in the implementation of a strong Conservation Lands Network: a newly protected parcel that connects existing protected lands increases the size of the contiguous block well beyond the incremental acreage of the additional parcel" (Bay Area Open Space Council, 2014). Conversely, the loss of a protected parcel decreases the value of the network beyond the incremental decrease in acreage.

A partner effort to CNL, the Critical Linkages project was started in 2010 to identify areas within the Bay Area that are vital for connectivity to the larger landscapes to the north and south (Penrod et al., 2013). The SDC property is part of the Blue Ridge-Coast Range preliminary linkage identified by the Critical Linkages project.

Connecting Communities and the Land

The Sonoma County Agricultural Preservation and Open Space District's 2006 long-range acquisition plan, *Connecting Communities and the Land*, outlines objectives, policies, and actions to direct land preservation efforts. One of four objectives identified for the Water, Wildlife, and Natural Areas category is to protect lands that provide viable habitat linkages for wildlife (District, 2006).

Native species that would particularly benefit from improved habitat connectivity are mountain lions, bobcats, American badgers, spotted skunks, black-tailed deer, raptors, and riparian birds. (West Coast Watersheds and Sonoma Ecology Center, 2010)

Other priorities identified in the District's acquisition plan that are directly applicable to SDC include protection of large, unfragmented oak woodland, riparian areas, and lands critical to water recharge. Throughout the document, collaboration with other agencies and organizations is identified as an important strategy to achieve long-term goals.

Sonoma County Biodiversity Plan

According to the Center for Biodiversity (2015), the Bay Area is one of the nation's six most important biodiversity hotspots and supports many plant and animal species found nowhere else. The Sonoma Community Foundation convened an expert advisory committee to bring together local knowledge about how best to protect this

biodiversity in Sonoma County. Based on interviews with regional science and policy experts, West Coast Watersheds and SEC prepared the Sonoma County Biodiversity Action Plan in 2010. The Action Plan identified habitat fragmentation as one of the largest threats to Sonoma County habitats and called for maintenance or enhancement of existing protected wildlife corridors (West Coast Watersheds and SEC, 2010).

Sonoma County General Plan

The Sonoma County General Plan 2020 highlights the importance of habitat connectivity to protect biodiversity and sustain plant and animal populations. Lands south of Glen Ellen connecting Sonoma Mountain and the Mayacamas Range are specifically called out as an important linkage (PRMD, 2008).

Policy OSRC-7h states, "In coordination with resource agencies, landowners and affected public, conduct a comprehensive study of the cumulative impacts of habitat fragmentation and connectivity loss and the effects of exclusionary fencing on wildlife movement. If warranted, identify essential habitat connectivity corridors and develop recommendations for policies to protect essential habitat corridors and linkages and to restore and improve opportunities for native plant and animal dispersal" (PRMD, 2008).

Protection of Water Resources

The streams, lakes, and groundwater on the SDC property provide water for wildlife on the site and downstream, and for people. With half of Sonoma Valley's water supply dependent on local groundwater, preserving the rainwater capture and infiltration capacity of the undeveloped SDC landscape is a highly cost-effective way to support recharge and sustain flows for steelhead, California freshwater shrimp, and other aquatic species in Sonoma Creek.

Sonoma County Groundwater Management Program

The Basin Advisory Panel (Panel), a group of twenty stakeholders representing varied water interests, has been working together since 2006 to manage groundwater resources in a sustainable way that meets both ecological and water supply needs. The Panel created the non-regulatory Sonoma Valley Groundwater Management Plan, which was subsequently adopted by the Sonoma County Water Agency, City of Sonoma, Valley of the Moon Water District, and the Sonoma Valley County Sanitation District. The report presents a range of voluntary water management options, including enhanced groundwater recharge, conjunctive use of surface water and groundwater, increased conservation, and greater use of recycled water. Studies by the Sonoma Ecology Center and Sonoma County Water Agency (2011) and GEI Consultants (2013) identified the SDC property as a potential location

for a groundwater recharge project.

California Water Action Plan

The 2014 California Water Action Plan (Water Plan) lays out a plan "to put California's water resources on a safer, more sustainable path" (California Natural Resources Agency, 2014). Ongoing protection of SDC addresses at least two of the Water Plan's ten key actions:

- Protect and restore Important Ecosystems, and
- Expand water storage capacity and improve groundwater management

At SDC, these two actions are closely intertwined. One of the specific measures identified in the Water Plan for protection and restoration of ecosystems is to "enhance water flows in stream systems statewide." In the groundwater management discussion, the Water Plan states, "the bottom line is that we need to expand our state's storage capacity, whether surface or groundwater, whether big or small. Today, we need more storage to deal with the effects of drought and climate change on water supplies for both human and ecosystem needs."

Trail Connections

Two local plans call for development of trails, one crossing Sonoma Valley and the other running through the center of it, and support State efforts to increase modes of active transportation and reduce greenhouse gas emissions. Trails connect people to the landscape and, as in the case of the proposed Sonoma Valley Trail, provide green alternatives to driving vehicles.

Sonoma County General Plan 2020

The Sonoma County General Plan 2020 identifies a future cross-valley riding and hiking trail, the Valley of the Moon Trail, that connects Napa County with Jack London State Historic Park and links Sonoma Valley Regional Park to Glen Ellen (PRMD, 2008). Not only is SDC the only existing public land that could support the proposed Valley of the Moon Trail between the State and County parks, but SDC's existing trails provide most of the connections necessary to implement this facility.

Sonoma Bicycle and Pedestrian Master Plan

Sonoma County adopted a Bicycle and Pedestrian Plan in 2010 that established goals, objective, policies, and project priorities for a bicycle and pedestrian transportation network in the county's unincorporated areas. The Sonoma Valley Trail, a proposed paved, off-road multiple use California Department of Transportation (Caltrans) Class I Trail following Highway 12 through the Valley to Santa Rosa, is listed as a Priority 1 Project in this document (PRMD, 2010). Sonoma County Regional Parks

was awarded a Caltrans community-based transportation planning grant to complete a feasibility study of the preferred alignment. The study showed that a dirt road paralleling the west side of Highway 12 on SDC property may provide a continuous off-road alignment for approximately a third of a mile of the proposed bikeway.

Active Transportation Program

In 2013, Governor Jerry Brown signed legislation creating the Active Transportation Program (ATP) in Caltrans. The purpose of the ATP is to encourage increased use of active modes of transportation. Key goals include increasing the proportion of trips accomplished by biking and walking, and advancing the efforts of regional agencies to achieve greenhouse gas (GHG) reduction goals. The Draft California Transportation Plan 2040 maintains a focus on multimodal mobility and GHG reduction (Caltrans, 2015).

5 Physical Features



Lake Suttonfield on SDC. Photo by Scott Hess, SLT.

Topography

The lands comprising the SDC property have varied topography (Exhibit 2). Elevation ranges from approximately 280 feet at Highway 12 along the valley floor to approximately 880 feet at Camp Via along the lower flanks of Sonoma Mountain. The southeastern portion of the property, on the floor of the valley, is relatively level to gently undulating. The northern edge and western portions of the property are gentle northeast-descending hills; slopes are typically less than 30% (Dwyer, 2001). Two narrow, deeply incised, northeast-draining stream canyons form the property's north (Asbury Creek) and south (Hill Creek) borders. These tributary streams feed directly into Sonoma Creek, flowing southward through the middle of the property. Two earth embankment-retained reservoirs are on the property. Fern Lake, about 1,600 feet long by 400 feet wide, is located at the western edge of the property at approximately 586 feet in elevation. Lake Suttonfield, about 1,200 feet by 1,000 feet, is in the northeastern part of the property at 280 feet in elevation. Beyond the property to the west, slopes begin to rise more steeply, providing a dramatic backdrop for the property with views to the top of the Sonoma Mountain.

Geology

SDC is located within the Coast Range Geomorphic Province (Province), which is characterized by basement rocks of the Franciscan Complex (about 200 million years to 65 million years before present) with sporadic overlays by remnants of geologically younger formations (Dwyer, 2001). The structure of the Province is northwest-trending, with major faults and folds, and mountains and valleys, all oriented in that direction. The Province is tectonically active with many active faults associated with the San Andreas Fault system. The resulting earthquakes and ongoing mountain building have resulted in steep mountain fronts with a high incidence of landslides and erosion.

Southeastern Sonoma County, SDC's region, is underlain by a deformed geologic structure referred to as the Santa Rosa block (Dwyer, 2001). This consists of relatively young continental, near shore, and volcanic rocks, which have been folded and faulted into the older basement rocks of the Franciscan Complex. These formations include, from oldest to youngest, the Petaluma Formation, the Sonoma Volcanics, and the Glen Ellen Formation. The Petaluma Formation is characterized by beds of clay, shale, silt, sand, and gravel, with local interbeds of tuff and diatomite. These are thought to represent deposits from rivers, lakes, and brackish lagoons or bays accumulated in Miocene times (approximately 7.1 to 5.5 million years before present). The Sonoma Volcanics overlay the Petaluma Formation. These consist of a complex series of lava flows and tuff beds. The most common rock is basalt and basaltic andesite, with rhyolite domes and plugs. The Glen Ellen Formation consists of more recently deposited layers of gravel, sand, tuff, and silt, with thick layers of conglomerates. These are primarily alluvial fan and landslide deposits.

According to a study of a 477-acre portion of SDC (Dwyer, 2001), "active fault traces are not known or suspected of passing through the property (Hart and Bryant, 1997), but the property has and will be affected by earthquake shaking. The faults with the highest estimated probability and closest proximity to SDC are the Rodgers Creek, North Hayward, and the main trace of the San Andreas. Of these, the Rodgers Creek fault poses the greatest risk of damaging shaking due to its close proximity (approximately 3 miles) to the property." A more recent study concluded that there is a 31% probability of a magnitude 6.7 or greater earthquake along the Hayward-Rodgers Creek fault within the next 30 years (USGS, 2008).

Based on Dwyer's (2001) study, the geologic and seismic hazards identified on SDC lands are:

- Land sliding – especially along the steep inner gorges of Asbury and Hill Creeks. Landslides pose a consideration for water

quality, salmonid habitat, and protection of land and infrastructure on SDC.

- Seismic ground shaking – a potential concern for the embankment of Fern Lake, although this has been inspected by the California Division of Dam Safety and is considered to be in "good" condition. Seismic activity could also activate landslides, as well as result in damage to structures, especially older buildings that have not been retrofitted for earthquake safety.
- Accelerated erosion – Dwyer noted a gully in one location below Fern Lake and along the system of dirt roads, and recommended repair or decommissioning of the road erosion sites.
- Expansive soils – found on lower slopes from Fern Lake to Arnold Drive. These are primarily a concern when planning construction and site development, and can usually be addressed by standard engineering and soil protection measures.

Dwyer (2001) found no geologic features on the site of unique significance. However, he points out that because it has been relatively undisturbed by development, it could serve as a valuable field trip site for local college and university geology students.

The Sonoma Valley contains a number of geothermal resources (Barber et al., 2012). Four of these geothermal springs occur along a northwestward trend from the city of Sonoma—including the SDC warm spring. The spring on SDC was first documented by Waring (1915; cited in (Youngs et al., 1983). "At the vegetable and dairy farm of the State Home at Eldridge water 72^{o}F in temperature is obtained from a spring that yields about 10 gallons a minute of water that is used in the dairy and for irrigation. The water broke forth at this spring at the time of the earthquake of April 18, 1906, and a flowing well 50 yards northward ceased to flow. A light colored tuffaceous rock is exposed a few yards from the spring." The spring was investigated on the farm on the Sonoma State Hospital by Youngs et al. (1983). A 10-foot diameter, 23-foot deep cistern was located under a hemispherical concrete lid with a water temperature of 68.5^{o}F. Additional springs may be present on the SDC property (Barber et al., 2012).

Soils

There are nine soil types mapped within SDC (NRCS, 2014; Exhibit 3 and Appendix A). In general, soils in the hilly portions of the site are derived from Sonoma Volcanics materials, while soils in gentler terrain are derived from alluvium. Most of these soils are moderately or well-drained, with the exception of Huichica loam (in the Core Campus), which can be somewhat poorly drained. Permeability is generally slow to moderate, and erosion hazard ranges from slight to high, depending on slope. Appendix A summarizes the general locations of these soils within SDC, as well as key characteristics based on Natural Resources Conservation Service data (NRCS, 2015). Soil types reported on the SDC property include:

- Clough gravelly loam
- Goulding clay loam
- Huichica loam
- Laniger loam
- Los Robles gravelly clay loam
- Red Hill clay loam
- Riverwash
- Spreckles loam
- Tuscan cobbly clay loam

The diversity of habitats on SDC – formed in part due to the underlying soils. Photo by SLT.



Climate

SDC and the surrounding Sonoma Valley have a Mediterranean climate, with a rainy, cool season typically lasting from November through April and dry, warm conditions the rest of the year. For the 30-year period from 1980 to 2010, mean daily minimum and maximum temperatures were 38 to 58° F in winter and 52 to 86° F in summer (NCDC, 2015). Approximately 60% of the annual rainfall in the region occurs in winter, with almost all of the rest occurring in fall and spring.

Annual rainfall has been recorded at SDC since 1954 (Barber et al., 2012). Average annual rainfall for this area is 29.34 inches. The driest year on record was 1976 when only 13.45 inches of rain fell at Fern Lake. The highest annual rainfall recorded by calendar year was in 1983 when an impressive 134 inches fell at Fern Lake. The most recent catastrophic rain event was in 2005, producing a 100-year storm event and knocking out the water diversion structures on Hill and Asbury Creeks (Barber et al., 2012). For the past four years, the Sonoma Valley and California in general have experienced extreme drought. The 2013-2014 water year was the third driest for the state in 119 years of record, and it was also the warmest year on record (USGS, 2015).

Climate Change

Based on USGS data, between 1911 and 2000, average maximum temperatures in the North Bay Region (Sonoma, Marin, and Napa Counties) have increased approximately 1.0^{o}F while average minimum temperatures have increased approximately 1.7^{o}F (NBCAI, 2013).



Low water level during 2014 drought at Lake Suttonfield. Photo by Scott Hess, SLT.

Climate models released by the International Panel on Climate Change in 2007 have been down sampled to develop regional predictions. These predictions suggest that these increases will continue, with summer temperatures rising by approximately 6 to 8°F, on average, by approximately the end of the century in this region (NBCAI, 2013). Average annual temperatures in the Sonoma area are predicted to increase from 3 to 5°F above their recent historic (1961-1990) average of 56.5°F (California Energy Commission, 2015) in that time.

Regional climate predictions differ in terms of trends in overall precipitation. However, all models predict that weather will be more variable in the future, with extreme events like droughts and floods becoming more common and more intense. Also, due to rising temperatures and the greater concentration of precipitation into short, extreme events, drought stress on soils and plants is expected to increase even if precipitation increases in the North Bay. This stress is modeled as climatic water deficit, which integrates measures of solar radiation, evapo-transpiration, and air temperature given available soil moisture derived from precipitation. According to NBCAI (2013), even in scenarios predicting wetter winters, measures of drought stress on soils in late summer are projected to increase approximately 10% in the North Bay.

These changes in climate pose a serious challenge to natural systems and human uses of SDC, as they do throughout California and the globe. Native plant and wildlife communities may change in composition and distribution, with potential losses of species that are less tolerant of higher temperatures and weather extremes. Water resources for humans, plants, and animals may decline, as a result of either lower overall precipitation or of more extreme storm events with less opportunity for rainwater infiltration. Flooding, fire, and disease may become more common. However, SDC's relatively intact and diverse natural landscape strongly bolsters its resilience to these changes. See *Climate Change Mitigation and Adaptation* above for additional discussion.

Climate models predict that summer temperatures in the Sonoma area will rise by 6 to 8°F by 2100 with average annual temperatures increasing by 3 to 5°F.

(North Bay Climate Adaptation Initiative, 2013)

Hydrology and Geomorphology

Sonoma Developmental Center sits within the central portion of the Sonoma Valley and the approximately 170 square mile Sonoma Creek watershed. Sonoma Creek bisects the eastern portion of the property. Through SDC Sonoma Creek is perennial, as it drains approximately 50 square miles and is fed by the numerous springs and seeps that characterize the upper Sonoma Valley. Two small tributaries, Asbury and Hill Creeks, flow from the western ridge of Sonoma Mountain and connect to Sonoma Creek at the northern and southern edge of the property, respectively.

Accounts of Sonoma Valley from the early and mid-1800s describe the valley as being covered with extensive marshes, ponds, vernal pools, and small channels (Barber et al., 2012; San Francisco Estuary Institute, 2008). These wetland features remained wet throughout the year, especially the wetland complex that extended from the watershed boundary down to Glen Ellen. Early settlers quickly drained the wetlands and cleared the vegetation to make way for agricultural land uses (Barber et al., 2012), which set in motion a cascade of changes to the stream network, creek morphology, streamflow patterns, groundwater levels, and all associated ecological habitats. Today Sonoma Creek and its tributaries likely look much different than they did in the 1800s. They are deeply incised into the valley's alluvial fill and are no longer connected to the floodplains.

Sonoma Creek

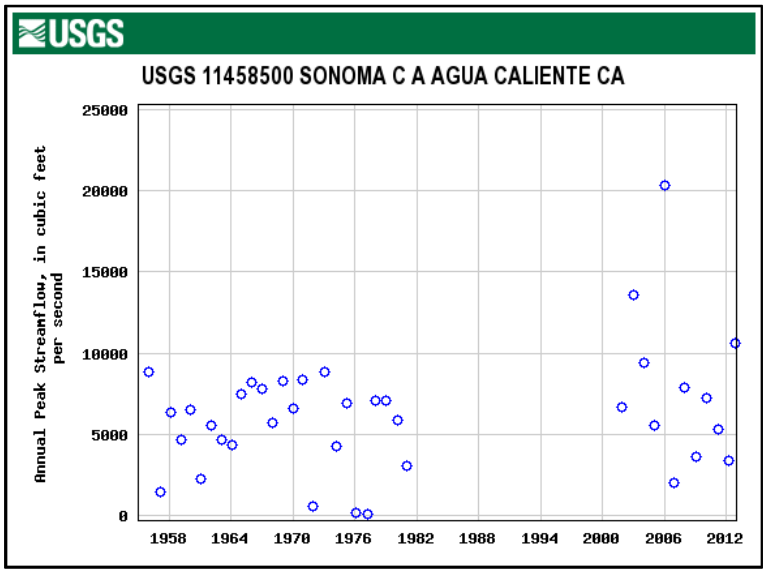
Sonoma Creek bisects SDC after it flows out of Warm Springs Canyon



Sonoma Creek through SDC during winter base flow.

and heads south towards San Pablo Bay. The 0.8 mile long section of the creek through the SDC property is characteristic of the creek's central reach that runs from Schellville to Glen Ellen with channel depths ranging from 20-35 feet and widths of 50-100 feet (SEC, 2006). The channel substrate is primarily gravel and cobble. Wide, low gravel bars are present that support willow and alder establishment. Pools are formed at meander bends and in relationship to channel obstructions such as large wood, live mature tree root complexes, and beaver dams. The banks have been stabilized in some locations with concrete blocks and other rubble (Barber et al., 2012). Mature riparian vegetation lines the steep banks and helps provide bank stability and limited canopy cover.

Sonoma Creek has a flashy and seasonally variable hydrology typical of the region's incised streams and Mediterranean climate patterns. For example, the average mean discharge during February in the wet winter period is 224 cubic feet per second (cfs) while in September at the end of the dry period it is only 0.75 cfs. (USGSb, 2015). Annual peak flows range from 100 cfs (1977) to over 20,000 cfs (2006) as recorded at the USGS streamflow gage at Agua Caliente approximately 3 miles downstream of SDC.



Peak flows in Sonoma Creek in the vicinity of SDC. Note the increased frequency of large flood events since 2000. Other large flood events not shown on this graph occurred in the region in 1986 and 1995.

Studies indicate that Sonoma Creek is a gaining reach through SDC, in that groundwater is discharging into the creek. During extreme drought conditions, such as in October 2014, the groundwater table is below the stream thalweg and it can become a losing reach (SCWA, 2015; Appendix H).

Tributaries

Asbury and Hill Creeks are relatively small drainages (See Exhibit 4 for map showing watersheds and creeks in relation to SDC). Asbury Creek and its tributaries drain approximately 1.1 square miles and Hill Creek drains approximately 1 square mile. Asbury Creek extends approximately 2.2 miles as a blue line stream and Hill Creek for 2.7 miles. Limited information suggests that the two tributaries are perennial, with intermittent dry sections in the summer associated with water diversions (Barber et al., 2012). Both Asbury and Hill Creek are water sources for SDC, with Asbury providing an estimated 60% and Hill Creek 30% of the property's total supply (See Appendix H for information on diversions).



Typical tributary channel and bank conditions in steeper, western portions of property.

Both watersheds are steep and prone to landsliding and bank instability along their western portions within SDC property, especially Asbury along its north side. This leads to chronic high sediment loads that move through the system in pulses of aggradation and erosion. Evidence in

historic maps suggests that a landslide event on Asbury Creek between 1954 and 1968 caused the creek to switch locations; it previously went down the Roulette Springs tributary course (Barber et al., 2012). The fairly steep, cascade-type channels are cut deeply into the hillsides. The channel beds are primarily cobble bedded and appear to be very dynamic. Woody debris is found within the channels and in some locations forms log jams, which serve to store sediment delivered to the channel. As the channels transition into the valley and through residential areas and the SDC Core Campus, the channels become encroached by development. Bank stabilization treatments, including concrete retaining walls and rock are prevalent. Evidence of channel downcutting is present with perched culverts and unstable, eroding banks.

Historically, the watersheds were logged, as were most of the forested lands in the valley (Nardo-Morgan et al., 1997). The forests have since recovered and the channels support mature vegetation along much of the stream corridors, including dense stands of second growth redwoods. Canopy coverage along both drainages exceeds 80% (Rossi & Micheli, undated).

Reservoirs

Two reservoirs are located on the property. Fern Lake is near the western edge of the property and holds 238 acre feet of water. Suttonfield Lake, on the eastern portion of the property, holds 600 acre feet. Both were installed in the early 1900s for water supply storage.

Groundwater

Groundwater is found in numerous geologic formations throughout the Sonoma Valley at varying depths, and SDC is within the Sonoma Valley Groundwater Management Program area. Appendix H describes the various geologic formations and groundwater level trends for wells that draw from specific formations (SCWA, 2015). The overall findings from the analysis of well data is that the water level in shallow wells in the Quaternary alluvial deposits appear to be relatively stable, while those somewhat deeper and completed within the Glen Ellen formation exhibit moderate declining level trends. Deep wells to the east of SDC have shown persistent declining trends in groundwater level, but there are no deep wells close to SDC to know whether this holds true more locally.

Groundwater recharge in the region is through streambeds and precipitation infiltration. On SDC, the principal method is through direct infiltration of precipitation, as the creeks appear to be intercepting the groundwater table. The amount of water that can be intercepted and infiltrated into the soil to recharge the groundwater is dependent upon soil type, slope, vegetation, and geology. Mapping of these

characteristics across SDC indicates that groundwater recharge potential varies from very good to poor, with the areas of highest potential in the eastern portion of the property, the flat alluvial areas adjacent to Sonoma Creek, and in a narrow band around Fern Lake on the western property boundary. Average annual recharge volume is estimated to be 640 acre feet per year, with a range of 45 to 1,430 acre feet. However, much of this recharge volume likely re-emerges on or near the property at springs, seeps, and stream baseflows (see Appendix H).

Viewsheds

Sonoma Developmental Center plays a key role in the scenic beauty of the Sonoma Valley. Residents, employees, and the general public walking on the property, as well as motorists and cyclists passing through the property via Arnold Drive, or Highway 12, can enjoy the grand vistas across the valley and see views of the full height of Sonoma Mountain from SDC, along these designated scenic corridors. They can also get intimate views of the intact woodlands and riparian corridors.

Spectacular views of San Pablo and San Francisco Bays, Mayacamas Mountains and Sonoma Mountain that are normally reached through long, steep hikes, are easily accessed by short walks in rolling hills surrounding Lake Suttonfield and Sonoma Valley Regional Park.

The property is visible from multiple vantage points across the valley including the adjacent Sonoma Valley Regional Park and Jack London State Historic Park. The mature trees lining the streets and historic buildings throughout the Core Campus provide visitors with an appreciation of the property's rich history and architectural diversity.

View of Sonoma Mountain from Lake Suttonfield. Photo by SLT.



6 Biological Resources



Acorn woodpecker cache in native oak tree.

Plant Communities

The range of elevation and diversity of soil types of the Sonoma Developmental Center support an array of plant communities. Upper portions of the property, on the western side, are dominated by dense, shady forests and redwood groves. Midslopes, in the central part of the property, are dominated by deciduous oak woodlands. Near the center of the property, a corridor of riparian woodland follows Sonoma Creek from north to south. The easternmost part of the property, with its gentle terrain, has been used more extensively for agricultural purposes and supports grassland with scattered mature oaks. In addition to these primary vegetation types, there are several other plant communities of note. Wetland vegetation occurs in narrow slivers along the periphery of the lakes, in isolated low-lying pockets in grassland and forest, and in the eastern grassland. Stands of coyote brush are present in some grasslands in the process of succession toward oak woodland. Even the developed core campus supports valuable vegetation, including many large, mature landscape trees as well as remnant natives.

Exhibit 5 provides a general map of SDC's vegetation types. This map is based primarily on work completed by USFS (2000) and LSA (2001), and interpretation of aerial imagery and related background information such as topography. The map is limited in detail and is meant only to provide a general view of the distribution of plant communities on the site. Similarly, the vegetation descriptions below are based primarily on

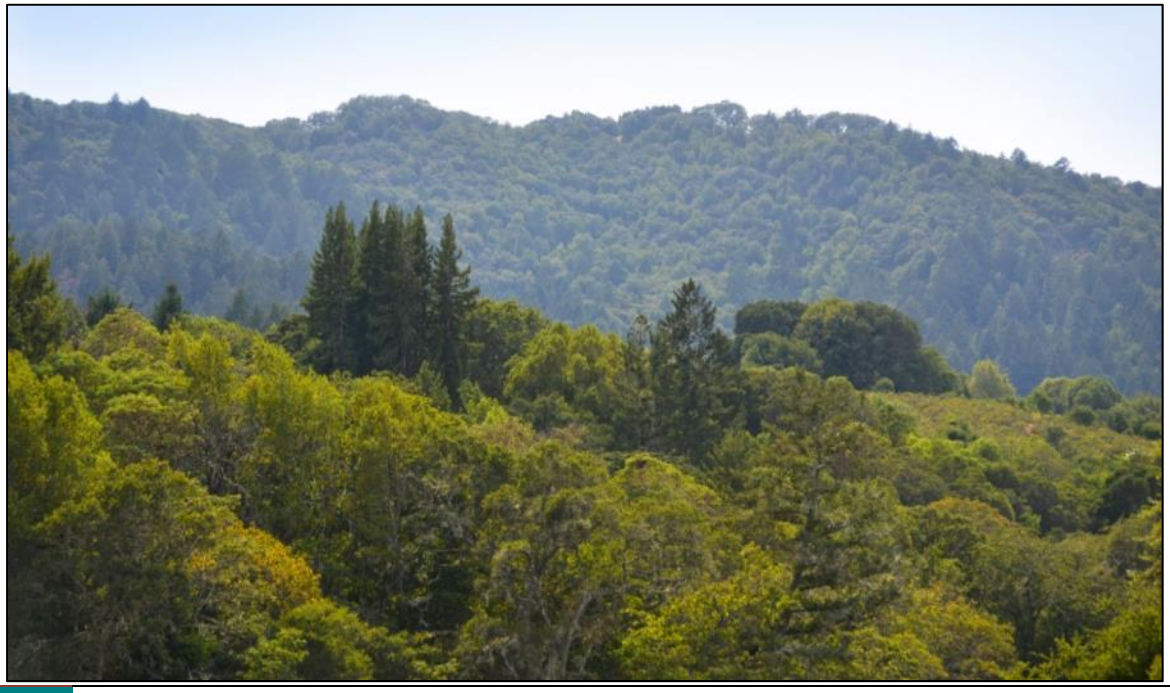
previous studies (LSA, 2001) and a review of regional plant occurrences (Calflora, 2015), and are limited in detail. A list of plant species common on SDC is provided in Appendix B. This appendix also provides Latin names for all species mentioned in the following text.

Mixed Evergreen and Redwood Forests

Mixed evergreen forests dominate the western part of SDC. A changing mosaic of coast live oaks, California bays, Douglas-firs, and madrones creates a dense canopy, with a limited understory of herbs and shrubs in their shade. On moister slopes, black oaks and big leaf maples can be found. Along the major drainages of upper Hill Creek and Asbury Creek, there are several stands of redwoods.

In openings where more sunlight reaches the forest floor, tree seedlings and saplings, shrubs, and herbs occur. These are mostly native species, including shrubs (poison oak, hazelnut, and snowberry); herbs (Pacific sanicle, false lily of the valley, sweet cicely, soaproot, hounds tongue, goldback fern, sword fern, and lady fern) and grasses (small-flowered melic, woodland brome) (LSA, 2001). Giant chain fern grows in seeps or isolated low spots where water collects. Invasive species are uncommon in these forests, occurring primarily in disturbed locations. Scotch and French broom are present along some roads and trails, and Himalayan blackberry occurs in some forested wetlands.

The forests on the property are relatively intact and undisturbed, with a diverse suite of natives and few introduced species. Sudden Oak Death, the forest disease caused by the pathogen *Phytophthora ramorum*, is known to occur within Jack London SHP and is likely to be present to



Mixed evergreen forest on SDC. Photo by Scott Hess, SLT.

some degree on SDC, but no large stands of affected trees are apparent and no infection has been formally identified (Oak Mapper, 2015). In addition, related pathogens *P. cimmamomi* and *P. cambivora* have been identified to occur within Jack London SHP. SDC's forests are continuous with extensive evergreen forests to the west, as well as to the north and south, on the lower flank of the Sonoma Mountains. Portions of these adjacent lands, however, have been cleared for vineyard.

The forests of SDC serve important functions of biodiversity conservation, wildlife habitat and connectivity, carbon sequestration, soil conservation, and water supply and water quality protection.

Oak Woodland

Oak woodlands dominate the central part of SDC, on the gentle hills on both sides of the Core Campus. These are characterized by a deciduous canopy of Oregon, blue, black, and valley oaks, which is nearly continuous in some areas and open and savanna-like in others. Coast live oaks and occasional bays are often present in drainages.

The dappled shade to full sun provided by these woodlands allows for a varied and well-developed understory. Depending on canopy density, this can include shrubs (poison oak, coffeeberry, wood rose), native perennial grasses (California fescue, blue wildrye, California oatgrass), vines (Dutchman's pipevine, California honeysuckle), and herbs (yarrow, soaproot, Pacific sanicle, milk maids, hounds tongue, Indian warrior, milkwort). Regenerating seedling or sapling madrones, oaks, and bays are also common.

Blue hounds tongue in oak woodland understory.



Several areas of the property have scattered oaks in a grassland setting. These savanna-like areas are found on relatively level land within the denser woodlands on the west side of the property, as well as within the grassland and agricultural lands on the east side of the property. Valley oaks and blue oaks are more common in these areas; some of the valley oaks are large, spreading specimens. Typically, coyote brush, manzanita and regenerating trees are also abundant, suggesting that these areas may be in transition toward more typical woodland habitat over time. These areas, with their gentle terrain, may have been grazed by livestock in the past, and when grazing was ended, tree regeneration may have been released. In addition to shrubs, there is extensive grass cover in these areas, with both native (California oatgrass) and non-native (annual bromes, Harding grass, and wild oats) species common.



Oak woodland habitat on SDC. Photo by Scott Hess, SLT.

Where the oak woodlands occur on slopes and steeper locations on SDC, they have not been heavily disturbed by human activities and retain a native-dominated understory. The savanna-like oak stands in gentler areas have a larger non-native component in their understory. Dense, extensive infestations of invasive species are rare in both settings. Natural regeneration of trees is visible in many areas. These oak woodlands are remnants of more extensive oak habitat that once lined the Valley of the Moon but which has been fragmented by human settlement and land use.

The oak woodlands and savannahs of SDC serve important functions of biodiversity conservation, wildlife habitat, carbon sequestration, soil conservation, and water supply and water quality protection.

Grasslands

Grasslands dominate the eastern side of SDC, and also occur in patches interspersed with woodland on the slopes of the western side. The eastern grasslands, used for agricultural purposes historically, are primarily composed of non-native annuals. The smaller patches of grassland to the west typically have a strong component of native perennial grasses within a matrix of annual species. Scattered mature oaks are also present in most of the grasslands.

The perennial bunchgrass-dominated habitats have clumps of long-lived grasses interspersed with forbs and annual grasses. California oatgrass and purple needlegrass are the most abundant bunchgrasses, with occasional patches of blue wildrye, foothill needlegrass, and one sided



Native milk maids in grassland habitat.

bluegrass. Native perennials are common, including milk maids, blue-eyed grass, California buttercup, Fernald's iris, narrow-leaved mule's ears, soap root, and hedge nettle (LSA, 2001). Many of the non-native forbs and grasses found in the site's annual grasslands are also present here.

Non-native annual grassland occurs throughout the eastern portion of the site. This grassland type is more homogeneous in structure than native grassland. The dominant annual grasses form a uniform cover rather than the patchy cover provided by perennials. Non-native forbs are common, while native forbs occur sporadically. Dominant grasses are ripgut brome, wild oats, and soft chess. Common non-native forbs are cutleaf geranium, vetches, filarees, Italian thistle, and hairy cat's-ear (LSA, 2001). Invasive species including yellow star thistle and medusahead are also common. The natives present include the disturbance-adapted common fiddleneck, miniature lupine, and California buttercup.

As described in the *Oak Woodland* section above, coyote brush is common in some areas transitional between grassland and woodland. Coyote brush is a disturbance-adapted species that often facilitates the re-establishment of oaks in previously grazed or disturbed areas, providing shade for the seeding oaks and then dying out as the oaks in turn shade the coyote brush.

Within low-lying grasslands, a few seasonal wetlands are present; see *Wetlands* section below.

In comparison with other Sonoma County grasslands of similar extent and use history, SDC's grasslands have a strong component of native species and limited invasive species infestations. Most of the upper grasslands have a substantial element of native perennial grasses. On adjacent properties, most low-lying grasslands have been developed for row crops or vineyard, making SDC's eastern grassland, with its scattered oaks, an important remnant habitat.

Native grasslands on SDC serve important functions of wildlife habitat, biodiversity conservation, soil conservation and water quality protection, and carbon sequestration. Non-native annual grasslands provide similar functions, but to a lesser degree. The grasslands have also served to support livestock grazing.

Riparian Woodland

Riparian woodland follows the course of Sonoma Creek through the property. White alders line the channel, while bays and oaks are abundant on the banks. Along the tributaries to Sonoma Creek, redwoods, bays, and other trees of the mixed evergreen forest are

common; see above for discussion.

The understory of this mostly deciduous canopy is comprised of a dense tangle of shrubs, vines, and herbs. Immediately along the channel, native torrent rush is common. Other vegetation is largely non-native, as is typical of Sonoma County's major creeks. Himalayan blackberry and vinca are abundant. Invasive giant reed (arundo) occurs in patches.

As in other habitats, invasive species along the creek can limit native plant diversity, change habitat structure, alter hydrology, and exacerbate erosion concerns. Invasive species are typically fast-growing and often create very dense stands, excluding other species with their intense competition for space, light, and water. As a result, the multiple layers of vegetation in a healthy native riparian setting—from herbs and shrubs to vines and trees—can be reduced to a single layer of vegetation, such as Himalayan blackberry. This in turn reduces wildlife habitat diversity. The loss of varied native plant types, with their varying root structures, can also mean reduced erosion resistance. For instance, Himalayan blackberry, with its relatively shallow roots, does not protect stream banks as well as a native mix of fibrous-rooted sedges and rushes with trees like oaks and alders, which are extensively rooted at multiple depths.

The riparian woodland on SDC is relatively wide and provides valuable shade and inputs of organic matter to the creek, supporting salmonids and other aquatic life. Despite the presence of invasive species, there are sufficient openings to allow native riparian trees to regenerate. The corridor is contiguous with riparian woodland upstream and downstream of the property, as well as being connected with intact upland habitats.

Stream corridors and their adjacent vegetation serve important functions of wildlife habitat and connectivity, climate change refugia, soil conservation and water quality protection. SDC's riparian woodland is especially valuable as its width and connection to upland habitats increase its value for wildlife habitat and movement, tree regeneration and recruitment, and temperature buffering.

Wetlands

Wetlands occur in several locations on the property. Aquatic and wetland vegetation is present in narrow bands along the shorelines of Fern Lake and Lake Suttonfield. A large seasonal wetland is present in the eastern grassland. Small, scattered seeps and swales support small seasonal wetlands elsewhere on the property.

Along the lakeshores, emergent species including native tule rushes and cattails are common. Adjacent to the seasonally fluctuating water's

edge, wetland species adapted to shallower water and seasonal drying occur; these include both natives (sneezeweed, northern water plantain, mugwort, and knotgrass) and non-native species such as velvetgrass (LSA, 2001).

Seep and swale wetlands on SDC are dominated by perennial sedges, rushes (common rush and irisleaf rush), and common spikerush. Other species commonly present include non-native pennyroyal and spinyfruit buttercup, and native common meadowfoam (LSA, 2001). The wetland in the eastern grassland is also characterized by perennial monocots, non-native teasel and Himalayan blackberry.

The habitat integrity of SDC's wetlands varies. Many of the wetlands on SDC are heavily influenced by human land use, including those that form around the created reservoirs and the large wetland in the east that has served as pasture. Both non-native and common native species are abundant in all of the wetlands.

While small seep wetlands are relatively common on undeveloped lands on the slopes of Sonoma Mountain, larger low-lying wetlands are rare in the Glen Ellen area, where filling and leveling for agricultural uses has dramatically reduced their extent. Wetlands provide groundwater recharge, mitigate storm flows, and filter contaminants and sediments from runoff. Aquatic and wetland vegetation also provide wildlife habitat, protects soil from erosion. The reservoirs provide additional wildlife habitat, as well as serving as water storage for human needs.



Wetland vegetation along the fringes of Fern Lake. Photo by Scott Hess, SLT.

Ornamental Landscaping

Within the Core Campus, there are many mature trees that have been planted for landscaping purposes, which provide ecological benefits as well as shady, beautiful places for people to enjoy. Large, spreading magnolias, tall sycamores lining the streets, and palms all provide wildlife habitat and shading of buildings. Remnant native valley oaks are present on the Core Campus as well, and native riparian trees have been retained along the creek where it divides the campus.





Native oak trees within the Core Campus on SDC.

Animal Communities

The diversity and abundance of animal species occurring on the SDC property is directly correlated to the diversity and richness of its vegetation communities. Habitats on the property offer both common and special-status animals nesting habitat, food, shelter, and water. The property is located at the core of the Sonoma Valley Wildlife Corridor and serves as an important movement corridor at both a local and regional scale.

Background Studies

Animal resources occurring on the property and the surrounding lands have been the subject of several previously published reports and ongoing monitoring efforts; however, comprehensive field surveys of SDC were not completed as part of this assessment. This summary is based on the existing reports and studies, as described below.

As part of the transfer land owned by SDC to State Parks, fish and wildlife resources were described in a land use feasibility study by LSA (2001). This included an evaluation of 477 acres of land surrounding Camp Via, Fern Lake, and the Asbury Creek drainage on SDC. Focused special-status surveys were completed for northern spotted owls, nesting hawks and owls, and California red-legged and foothill yellow-legged frogs. Additional resource studies completed on adjacent Jack London SHP property have included focused northern spotted owl (Evens, 2009) and California red-legged frog surveys (Fawcett, 2011) as well as resource studies on nearby District properties (PCI, 2012).

In addition, surrounding properties were the focus of two wildlife assessments by PCI including an assessment (PCI, 2013) on Sonoma Land Trust properties including Curreri and Stuart Creek Hill to the north of SDC along the valley floor and Secret Pasture in the Mayacamas Mountains to the east, and an assessment for the recently completed fish passage work on Stuart Creek by SLT (PCI, 2014). All of these properties support habitat similar to those found on SDC.

The Glen Ellen area, including SDC, is part of the Sonoma Valley Christmas Bird Count (CBC), a nationwide winter bird survey over a two-week period around Christmas which documents species composition and numbers of birds. During the counts, a group of birders record the number of individual birds observed in a given area over a one-day period. SDC is also part of a county-wide effort to document all breeding birds, the Sonoma County Breeding Bird Atlas (BBA) project (USGSa, 2015). The BBA is in its final year of a five-year study that began in 2011. A similar effort was completed 20 years ago (Burridge ed., 1995). Both of these surveys are sponsored by Madrone Audubon Society.

With the support of SLT and SEC, a citizen science wildlife survey effort was initiated on SDC to establish baseline data on birds and other wildlife. The effort was spearheaded by members of the Redwood Regional Ornithological Society. The goal of the effort is to survey the property once every two months with groups of individuals assigned to one of five areas on SDC. Surveys will track the abundance of species throughout the cycle of the seasons. Efforts were started in November 2014 and have been completed each month since then; current results are included in Appendix D.

A number of background studies have been completed within the Sonoma Creek watershed and its tributaries to document instream and riparian habitat conditions and aquatic resources. CDFW protocol-level inventories of mainstem Sonoma and Asbury Creeks were completed by Southern Sonoma County Resource Conservation District in 1996 (SSCRCD, 1996). These inventories document the availability of instream habitat and aquatic resources. Robert Leidy of the U.S. Environmental Protection Agency has prepared several regional documents outlining fish surveys and stream conditions in the San Francisco Estuary, including Sonoma Creek and its tributaries (Leidy, et al., 2005; Leidy, 2008). Aquatic species presence and instream conditions were also evaluated as part of the LSA (2001) study, and more recently for the *Watershed Sanitary Survey* which included SDC lands (Barber et al., 2012). An inventory of fish barriers within the watershed was completed in 2003-2004 (Katopothis, et al., 2005).

Animal Communities Overview

Sonoma County is one of the most biologically diverse regions in California. With its varied topography, geographic location, and proximity to the coastal habitats and baylands, it supports untold numbers of fish, amphibians, reptiles, mammals, birds, and insects. Each of these species plays a distinct role in the biotic community. These creatures include both familiar species that occur across the region and critically endangered ones with highly restrictive ranges. The biological diversity of SDC and the larger Sonoma Valley reflects that of the county. It too provides the variety of habitats and microhabitats that so many of the county's animal species depend on.

SDC supports 129 bird species and approximately 20% each of all of the amphibians, reptiles, and mammals known in California.

(California Department of Fish and Game, 2013)

SDC supports an abundance and diversity of animals, based on both documented occurrences and general habitat conditions that meet the needs of wildlife species within this region. The property itself is large and diverse enough to sustain a wide variety and abundance of wildlife species through part or all of their life cycle. SDC is perfectly positioned within the landscape so that wildlife can move through it to and from surrounding lands. It provides key habitat for Sonoma County's top carnivores, including mountain lions and bobcats with large home ranges, and contributes to the genetic diversity that helps build

resiliency in regional wildlife populations.

Sonoma County, in general, supports a large number of animal species—and a high percentage of these are known from SDC itself. There are 433 documented bird species in California; 421 of those have been reported in Sonoma County (Bolander & Parmeter, 2000). SDC makes up only a small fraction of the land in Sonoma County (0.09%); however, it has been reported to support 129 species, 31% of the county-wide total (Appendix D). Similarly, there are 165 native bird species documented breeding in Sonoma County; 102 of these have possible or confirmed breeding occurrences in and surrounding SDC (USGSa, 2015) (Appendix D).

SDC supports documented or potential habitat for 11 species of amphibians (22% of the state's documented 51 species); 16 species of reptiles (19% of the state's 84 species); and 43 species of mammals (22% of the state's 197 species). The property is also home to several special-status species including California freshwater shrimp, northern spotted owl, and steelhead.

Animal Communities Descriptions

The following discussion includes a general summary of wildlife typically associated with each documented habitat on SDC based on regional occurrence information, background studies and surveys, and reported observations. Although characteristic assemblages of wildlife species occur predictably within certain vegetation types, relatively few animals are restricted to a single habitat, and indeed, some may require more than one habitat type. Therefore, wildlife communities are described in a larger context and across broader plant communities: forests and woodlands, grasslands, aquatic habitats (i.e., riparian habitat and streams, reservoirs, wetlands) and urban environments. Aquatic species assemblages are discussed in their respective habitat. A discussion of wildlife connectivity and permeability based on background studies and monitoring work by SLT and the Merenlender lab follows the community descriptions. Life history information and local occurrence information for special-status animal species are described in the next section. For a complete list of all wildlife species observed or potentially occurring on SDC, including scientific names, see Appendices C and D.

Female spotted towhee in woodland understory.



Forests and Woodland

Forests and woodlands provide the greatest habitat diversity on SDC and support terrestrial birds, mammals, amphibians, reptiles, and a variety of invertebrates. Birds represent the most abundant and prominent wildlife species within these habitats. Year-round resident birds of woodland and forest habitats such as those found within the property include chestnut-backed chickadee, western-scrub jay, American robin, common bushtit, oak titmouse, Bewick's wren, California quail, dark-eyed junco, and spotted towhee.

Migratory species observed and potentially breeding within the property include orange-crowned warbler, Pacific-slope and ash-throated flycatchers, and swallows.

Tree climbing birds such as woodpeckers, nuthatches, and brown creeper also frequent the property. Casual winter residents include red-breasted sapsucker, ruby-crowned kinglet, varied thrush, and Townsend's and yellow-rumped warblers. The dense fir and redwood patches are also key habitat for Sonoma County's largest woodpecker, the pileated woodpecker.

Suitable foraging and breeding habitat also exists on the property for raptors. Red-tailed, red-shouldered, and Cooper's hawks have all been confirmed nesting nearby. Falcons, including American kestrel, frequent the area as well. Cooper's and sharp-shinned hawks, uncommon forest and woodland hawks, use the site especially in winter when they are more readily observed. Small vertebrates within the habitats serve as a food source for predatory hawks and falcons. The larger oak, fir, and redwood trees are prime habitat for nesting raptors. LSA (2001) reports that the site provides excellent raptor nesting habitat.

Mature redwood and Douglas-fir habitats on the property are likely to support northern spotted owl given the close proximity to established territories and the large territory size of this species. There are documented territories just outside of the SDC property boundary on Jack London SHP and private lands (Evens, 2009), and LSA (2001) documented three owls in the redwood habitat along Asbury Creek in June 2000. Dusky-footed woodrats are the preferred food source for spotted owls and occur within the understory of SDC's woodlands.

Of particular concern for the northern spotted owl is the recent establishment of barred owl in Sonoma County, a species native to eastern North America, but one that has been expanding its range westward. It is unclear whether this range expansion is a natural phenomenon, human-caused, or a combination of both. Barred owls are larger and more aggressive than spotted owls and can displace, disrupt nesting, and compete directly with spotted owls. Careful monitoring for, and, if needed, management of, the barred owl at SDC will be important to protecting local northern spotted owl populations. Additional native owl species documented within SDC and nearby include barn, western screech-owl, great horned, and northern pygmy owls.

The woodland and forested habitats of SDC support a variety of mammals. Undisturbed habitats with limited human activity provide escape, cover, migration corridors, and nesting sites for a number of larger mammals. Mammals documented on SDC and surrounding lands include Sonoma County's top predators - mountain lion, bobcat, and coyote (Nelson , 2015). The presence of a large number of smaller vertebrate species, such as birds, small mammals, and herpetofauna serve as a significant food source for these top carnivores. SLT has documented the occurrence of several prey species in high numbers and on a routine basis via camera monitoring; these include black-tailed deer, raccoon, western gray squirrel, and gray fox (see *Wildlife Connectivity and Permeability* below). The diversity of forested and wooded habitats on SDC and their proximity to aquatic habitats also provides excellent foraging and roosting habitat for bats, including several special-status species.

Coyote detected by motion-activated camera operated by SLT. Photo by SLT.



Native oaks and oak communities found within the property serve as a significant resource for many wildlife species in the form of both food and shelter. Every part of the oak tree is utilized as forage for native species including acorns, leaves, twigs, pollen, roots, and sap. Perhaps the most widely recognized source of food is the acorn. This high-energy food is used heavily by acorn woodpeckers, western-scrub jays, and western gray squirrels. Individual trees are also important food storage sites for acorn woodpeckers, which cache acorns for future consumption, particularly in dead and dying oak trees. Many acorn caches occur throughout SDC, including in palm trees of the Core Campus. The use of acorns by a number of wildlife species is important for oak dispersal and regeneration. The entirety of an oak tree, from canopy to roots, also serves as shelter for wildlife. Even the layer of detritus around the base of an oak is utilized by amphibians and insects.

On the woodland and forest floor, woody debris piles and layers of duff provide habitat for amphibians. Locally common amphibians including Ensatina, California slender salamander, and arboreal salamander are likely to occur on SDC. Common reptiles of this community include Skilton's skink, fence lizard, alligator lizard, common kingsnake, rubber boa, gopher snake, rattlesnake, and ring-necked snake. SDC also supports habitat for a variety of native butterflies, other beneficial pollinators, and additional invertebrates.

Grasslands

Grasslands provide habitat for a range of wildlife species. They provide cover for species such as birds, small mammals, and reptiles, as well as provide a food source in the form of seeds, other plant parts, and insects. Oak trees scattered throughout the grasslands on SDC provide



A pair of western bluebirds explore the leafless branches of an oak tree for food.

key habitat for birds and other wildlife; the value of oaks trees is discussed in the *Forests and Woodlands* section. Many of the grasslands on SDC are also interspersed with coyote brush. These shrubby patches increase habitat complexity of the grasslands, providing additional perching, foraging, and nesting opportunities.

Grassland songbirds, including grasshopper sparrow, rufous-crowned sparrow, savannah sparrow and western meadowlark, use the property for nesting as all of these species have been seen nearby during the breeding season. Additional representative grassland species such as the western bluebird, loggerhead shrike, and Say's phoebe utilize grasslands, especially when there are adequate perches to forage from. Predatory hawks and owls, including American kestrel, white-tailed kite, and barn owls, frequent these areas as well. Small vertebrates and invertebrates within the grasslands are a key food source for owls and other predatory species.

Subterranean foragers, such as Botta's pocket gopher and California mole, commonly occur in grassland habitats. Underground digging and mounds and small wildlife tunnels can be seen throughout the property and are clear indicators of the presence of subterranean wildlife and small mice and voles. Scattered oak trees and coyote brush provide additional browsing and protective cover for wildlife. Brush rabbits occur along the grassland edges and eat twigs, evergreen leaves, and bark from plants. Shrubs are important to many other mammals (e.g., bobcat, gray fox) as shade during hot weather. Reptiles of this community include western fence lizard, alligator lizard, western skink,

and snakes. Bats also forage over grasslands. Seasonal wetlands mixed within the grasslands add to the habitat complexity, providing additional foraging and nesting opportunities (see *Wetlands* below).

Riparian and Aquatic Habitats

SDC supports three stream channels with adjacent riparian habitat. Sonoma Creek bisects the property, and Asbury and Hill Creeks form the northern and southern property boundaries, respectively. Two freshwater reservoirs (Fern Lake and Suttonfield Reservoir) and seasonal wetland habitat are also present.

Riparian Habitat and Streams

Riparian habitats tend to have an exceptionally high value for both aquatic and terrestrial animals. In general, riparian habitats and stream channels provide nesting opportunities, food, and shelter, and may serve as corridors or islands during migration for a variety of fish and wildlife species. Riparian vegetation provides foraging and nesting opportunities for both migrant and resident birds. A number of bird species are closely tied to the creek itself. Herons and egrets forage for fish and other vertebrates in shallow waters, along with the fish-eating belted kingfisher. Birds like the black phoebe are seen sallying over water sources for aerial insects, and dabbling ducks such as mallards and wood ducks are frequently observed foraging within stream channels. Bird species occurring both along riparian corridors and in adjacent uplands on SDC include red-shouldered hawk, California quail, mourning dove, great horned owl, Anna's and Allen's hummingbirds, downy and hairy woodpeckers, western wood-pewee, Pacific-slope flycatcher, tree swallow, Steller's and western-scrub jays, chestnut-backed chickadee, bushtit, Bewick's wren, Swainson's thrush, American robin, wrentit, warbling vireo, orange-crowned, yellow and Wilson's warblers, black-headed grosbeak, spotted towhee, song sparrow, purple finch, and American goldfinch. All of these species have confirmed occurrences on SDC or in the surrounding areas.

California newt (top) and California giant salamander (bottom) in nearby streams in Sonoma County. These species are likely to occur on SDC.





Aquatic salamanders, including newts and giant salamanders, utilize stream channels during the wet winter months, and terrestrial species (e.g., slender salamander, Ensatina) inhabit the adjacent woodlands. Stream channels also provide potential breeding and foraging habitat and migration corridors for other amphibians, including western toad, Sierran treefrog, and foothill yellow-legged and California red-legged frogs. Foothill yellow-legged frogs are known to occur in tributaries to Sonoma Creek (CDFW, 2015), and California red-legged frogs occur within the Sonoma Mountain watershed and upslope of SDC on nearby District-owned properties (PCI, 2012). The most common reptiles of riparian habitats are the northern western pond turtle and aquatic garter snake.

A few typical mammals of riparian habitats in the region include western gray squirrel, dusky-footed woodrat, northern raccoon, and black-tailed deer (see discussion about beavers below in the Sonoma Creek section). In addition, common bat species may forage over stream channels and adjacent woodlands and roost within the larger trees. The stream channels themselves are an important habitat for a variety of aquatic organisms that serve as the food base for larger aquatic and terrestrial species. Fisheries resources and other aquatic species are described below for the individual watersheds. Mostly importantly, riparian habitats act as key migration corridors at both a local and regional scale.

Sonoma Creek

In comparison with other Bay Area drainages, the Sonoma Creek watershed provides an ecological refuge for a number of sensitive species (SEC, 2006). The watershed is also considered one of the most essential steelhead resources of the San Francisco Estuary (Becker et al., 2007). The Sonoma Creek reach within SDC is a small component of the larger stream system, but it represents vital habitat and a key connection through the watershed.

Sonoma Creek, where it flows through SDC, is a fairly low-gradient channel. It enters the property after crossing under Arnold Drive near Sonoma Valley Regional Park. After a sharp bend, it crosses back under Arnold Drive and then flows through a fairly straight channel for the remainder of the property. Instream habitat in the vicinity of Glen Ellen and Arnold Drive near SDC has been characterized as being wide, low-gradient riffle and run habitat (SSCRCD, 1996). Through the property, the substrate is comprised of boulder and cobble and embedded with sand. Debris is present in the channel. Exposed sand bars occur within the channel as well. Undercut banks are present but stable (Cox, 2014). Tree canopy cover is high, and the water's surface is relatively exposed to sunlight. Riparian understory vegetation is dense along the banks.

The Sonoma Creek watershed is one of the most important steelhead resources remaining in the San Francisco Bay region.

(Becker et al., 2007)

Within Sonoma County, mainstem Sonoma Creek and several of its tributaries have the highest priority ranking based on the availability of remaining steelhead habitat and the most immediate needs for restoration and potential for habitat restoration (Becker et al., 2007; Penrod et al., 2013). Historically, the Sonoma Creek watershed supported the second largest steelhead run among Bay Area streams (Becker et al., 2007). Today, the mainstem and a number of tributaries still support notable runs of steelhead. However, steelhead production in the watershed is still limited by the availability of suitable spawning habitat, availability of water, fish passage barriers, sedimentation, and water temperatures (SEC, 2006). In addition to steelhead, small numbers of adult Chinook salmon are frequently reported in the watershed; however, they are believed to be strays from the



Beaver dam near Glen Ellen on mainstem Sonoma Creek. Photo by Brock Dolman.

neighboring Napa River and not a self-sustaining run. The creek is also known to support California roach, threespine stickleback, Pacific lamprey, Sacramento pikeminnow, Sacramento sucker, prickly sculpin, and riffle sculpin (Cox, 2014; Penrod et al., 2013).

In addition to fisheries resources, Sonoma Creek running through SDC provides important habitat for a number of other aquatic species. The SDC reach is known to support a fairly robust population of California freshwater shrimp, a federally and State endangered crustacean, with habitat ranging from suitable to marginal (Cox, 2014). Freshwater shrimp are endemic to only three counties—Napa, Sonoma, and Marin—and found within four geographic regions, including Sonoma Creek (USFWS, 1998).

Sonoma Creek supports a small population of beavers. After being exterminated from the watershed in the mid-1900s due to the California Fur Rush, beavers returned in 1996 only to be trapped and killed once more after destroying merlot grapevines in a creekside vineyard. Community uproar and a shift in attitude ensued. Beavers have since returned, and now, sightings are common near Sonoma and Glen Ellen. On SDC the property, beaver dams and scat are frequently seen along the creek (Barber et al., 2012; Nelson , 2015). Sonoma Creek and its tributaries also support river otter.

Asbury and Hill Creeks

Fisheries resources within Hill Creek are limited. According to Katopothis et al. (2005), there are two complete fish passage barriers within the watershed, resulting in the loss of 100% of available habitat.

The barriers are described as box concrete culverts at Arnold Drive and Redwood Road. In addition, Becker (2007) describes the watershed as being relatively steep which may restrict fish passage.

In 2007, steelhead of unknown life stage were documented in Hill Creek 100 feet downstream of the road crossing at Arnold Drive on SDC (Leidy, et al., 2005). Also, SEC reported seeing a small number of steelhead young-of-the-year and one-year and older fish, at an unreported location (Leidy, et al., 2005). California roach and sculpin have been documented in the watershed (Leidy, 2008). LSA (2001) reports that Hill Creek is probably too shallow to support fish.

Asbury Creek has two partial fish barriers noted within the watershed that may restrict passage. A concrete flume located immediately upstream of the Sonoma Creek confluence is reported to restrict passage during high flows, outside of the SDC property (SSCRCD, 1996). A diversion pipe on SDC land is mapped as a potential partial barrier by Katopothis et al. (2005) and described as a barrier to anadromous fish by the Southern Sonoma County Resource Conservation District (SSCRCD; SSCRCD, 1996). Becker (2007) describes the watershed as being relatively steep which may restrict fish passage.

In 1996, six steelhead were seen in Asbury Creek between the concrete flume and the diversion pipe during a stream inventory by SSCRCD (1996). The survey team noted that the lower reaches of the watershed provided limited spawning habitat and the presence of fine sediment. The upper reaches supported good spawning habitat and spring-fed

Upper reach of Hill Creek.



summer flows. Long-time residents reported that the creek was once a productive steelhead stream prior to the installation of the concrete flume. SSCRCD (1996) reported that "Winfred Smith has lived on Asbury Creek over 30 years and recalls the great steelhead he enjoyed years ago," (SSCRCD, 1996). LSA (2001) noted Asbury Creek supported suitable fish habitat and documented the presence of unidentified fish, possibly speckled dace, California roach, or stickleback.

Reservoirs

Fern Lake and Suttonfield Reservoir are both man-made impoundments constructed specifically for water supply in the 1900s; however, they also serve as important wildlife habitat. These features provide open water habitat and aquatic vegetation along the margins. Like most reservoirs, they were likely stocked with non-native fish for recreational fishing. LSA (2001) reports seeing bass and sunfish in Fern Lake. No Fishing signs are posted at both reservoirs. Non-native crayfish and American bullfrog have also been documented at Fern Lake (LSA 2001). These non-native species serve as food sources for wildlife, especially piscivorous birds like double-crested cormorant, hooded merganser, great blue heron, and belted kingfisher, all of which have been seen on SDC, and mammals like river otters and raccoons. However, non-native aquatic species can be detrimental to native fish and wildlife and need to be carefully managed. These non-native species can compete directly with and prey on native wildlife. For example, the presence of non-native fish and American bullfrog within the reservoirs may preclude California red-legged frog from successfully breeding there. Bullfrogs are at a competitive advantage due to their larger size and longer breeding season. They have been known to prey upon red-legged frogs and outcompete the species. California red-legged frogs were not documented in Fern Lake during multiple site visits in 2000 (LSA 2001); however, suitable habitat is present. Both reservoirs provide suitable habitat for pond turtles. Two turtles were observed in November 2014



Pair of mallard ducks on Lake Suttonfield.

in Fern Lake during a citizen science wildlife survey (Hunn, 2015).

The open water reservoirs also provide foraging opportunities for waterfowl and wading birds who consume aquatic invertebrates and plants. Mallard, pied-billed grebe, western grebe, Canada goose, American wigeon, bufflehead, common goldeneye, ruddy duck, and great egret are common visitors to SDC. Smaller songbirds may use the habitats for foraging and nesting. Black phoebes and swallows sally over aquatic habitats, catching insects on the wing. Red-winged blackbirds and marsh wrens commonly nest along reservoir margins in emergent vegetation. Many birds (e.g., swallows, Steller's jay, American robin) also rely on exposed mud banks along the water's edge for construction of all or portions of their nests. Small and large mammals are attracted to reservoirs not only as a direct source of water, but also to prey on abundant wildlife. The unobstructed open water is very important for bats which drink in flight and require large swoop zones. These reservoirs provide a year-round water supply for wildlife and serve as critical watering holes when other sources have dried up.

Wetlands

Seasonal wetlands occur in seeps and swales throughout the oak savannahs and within the low-lying valley on the east side of the property. These seasonal features, like the reservoirs, are important habitat for wildlife. Wetlands support a suite of endemic invertebrates that are well-adapted to life in these seasonal environments. These include a variety of crustaceans such as clam shrimp, copeopods, and water fleas, and aquatic beetles, dragonflies, damselflies, aquatic snails and worms, and zooplankton. These invertebrates serve as a food source for amphibians and birds. Shallow pockets of water provide breeding habitat for common amphibians such as the Sierran treefrog, which is most active during winter months, and is known to breed in SDC wetlands. Given their shallow, ephemeral nature, seasonal wetlands are not likely to be used by California red-legged frogs for breeding, but they may provide important foraging habitat. Associated wetland and adjacent upland vegetation provides additional foraging habitat, cover, and nesting sites for wildlife.

Urban Areas

The wildlife habitat values of developed areas are generally considerably less than those of the surrounding natural habitats. Wildlife in the developed areas are typically more acclimated to human activity and include species common in urban and suburban habitats. Common mammals include native raccoon, striped skunk, and non-native Virginia opossum, rats, and mice. Ornamental trees and shrubs provide roosting and potential nesting substrate for numerous species of birds. Mature valley oaks and palms within the Core Campus are used by woodpeckers to cache acorns. Other common native birds include

western scrub-jay, northern mockingbird, and house finch. McDonald (2015) has made personal observations of a colony of hundreds of Vaux's swift emerging from a chimney in one of the old buildings on the property. Non-native birds are also prevalent including house sparrow, European starling, and rock dove.

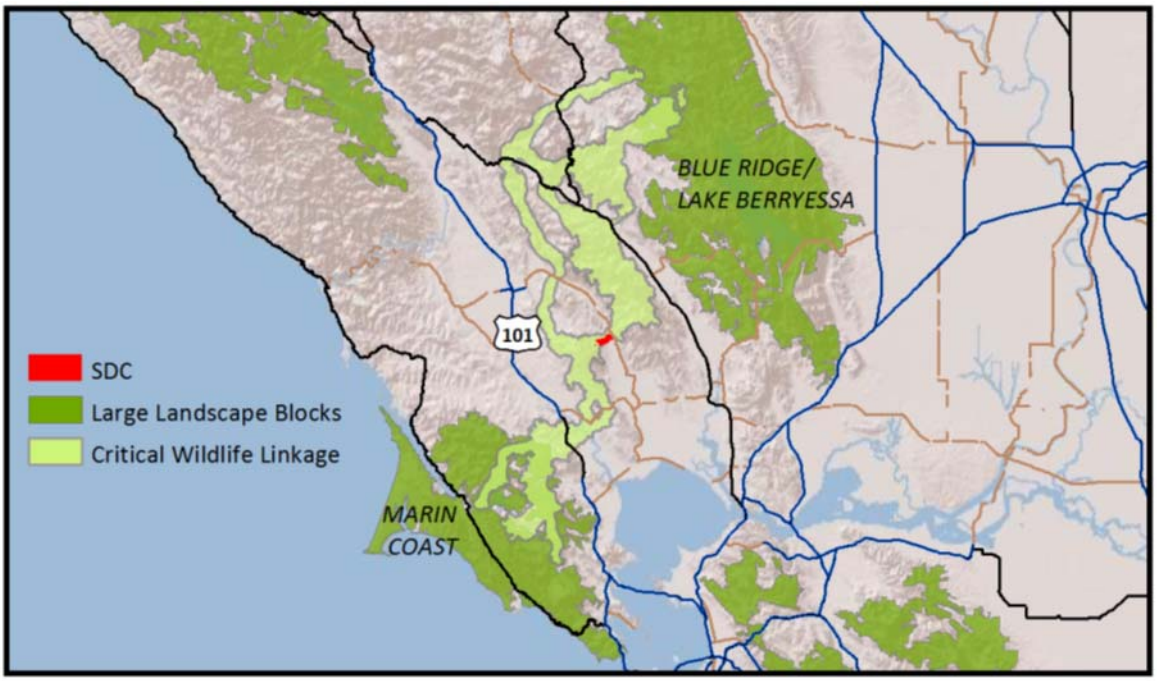


Figure 2. Location of Sonoma Developmental Center and Regional Wildlife Corridors

Wildlife Connectivity and Permeability

SDC is situated at the heart of the Sonoma Valley Wildlife Corridor, one of California's most biologically diverse critical linkages for wildlife. The Corridor encompasses over 10,000 acres of land stretching from Sonoma Mountain east across Sonoma Valley to the Mayacamas Mountains (Exhibit 1). It is a key linkage in a larger corridor from coastal Marin to eastern Napa County. With only half of the land comprising the Corridor under permanent protection, much of the remaining land is subject to development pressure and the permeability and integrity of the Corridor is at risk (SLT, 2014) with potential impacts for the long-term survival of our local and regional wildlife populations.

*A **wildlife corridor** is an area of habitat connecting wildlife populations otherwise separated by human activities or structures (e.g. roads, development, or logging). Wildlife corridors allow an exchange of individuals between populations separated by habitat fragmentation, which helps prevent the negative effects of inbreeding and reduced genetic diversity that often occur within isolated populations.*

Beginning in the 1990s, the Sonoma Valley Wildlife Corridor began to be recognized as an area of significant wildlife presence and movement (SLT, 2014). Early efforts by SDC staff person Christy Vreeland and the Sonoma Ecology Center were successful at advocating for the inclusion of the property and surrounding lands as a crucial wildlife corridor (see text box) in the General Plan 2020 (PRMD, 2008). The General Plan update identifies the need to protect linkages and corridors to allow movement across the landscape and to connect wetland and other important habitat areas to undeveloped lands and permanent open space. The lands south of Glen Ellen connecting Sonoma Mountain and the Mayacamas Ranges, including SDC, were identified as an important linkage.

In 2011, the Bay Area Open Space Council completed the *Conservation Lands Network* (CLN), a five year effort to identify a network of lands aimed at conserving key biodiversity targets within the nine-county Bay Area. The CLN recognized lands that are crucial for conserving biodiversity based on vegetation types, species, and riparian zones. It identified the Sonoma Valley Wildlife Corridor and Sonoma, Hill, and Asbury Creeks as key areas for conservation (Bay Area Open Space Council, 2011).

A more detailed analysis of the linkages identified in the CLN was completed by Science & Collaboration for Connected Wildlands (SC Wildlands). Their report, *Critical Linkages: The Bay Area and Beyond*, identifies areas that are vital for connectivity within the Bay Area and across the larger landscape to the north and south (Penrod et al., 2013). This includes 14 landscape connections designed to preserve landscape-level processes and maintain wildlife populations. Based on a least-cost corridor analysis (see text box) of 66 focal species with a range of habitats and movement requirements, the best potential routes were identified between targeted areas. The Sonoma Valley Wildlife Corridor, including SDC, was identified as part of the Blue Ridge – Marin Coast Linkage which connects lands surrounding Lake Berryessa in Napa County with coastal habitats in Marin, and encompasses 227,370 acres of land (Exhibit 1).

Least-cost corridor analysis *is a GIS technique that models the most efficient route for a species to travel between targeted areas based on how that species is affected by various landscape characteristics (e.g., vegetation, topography). It is used to help identify the most effective places for wildlife corridors.*

A more localized study of the landscape connectivity within the Mayacamas region was funded by the District and completed by Adina Merenlender and her lab at UC Berkeley in 2010. The *Mayacamas Connectivity Report* generated and tested a landscape connectivity model to provide a basis for the conservation of habitat linkages with the greatest biological benefit and resiliency in the face of climate change. The work included developing a biologically informed structural habitat connectivity model that provides an estimate of the permeability of oak woodland habitat in the region in light of existing developed areas. The Sonoma Valley Wildlife Corridor was identified as a crucial pathway between Sonoma and the Mayacamas Mountains, as well as one that is threated by ongoing development (Merenlender et al., 2010).

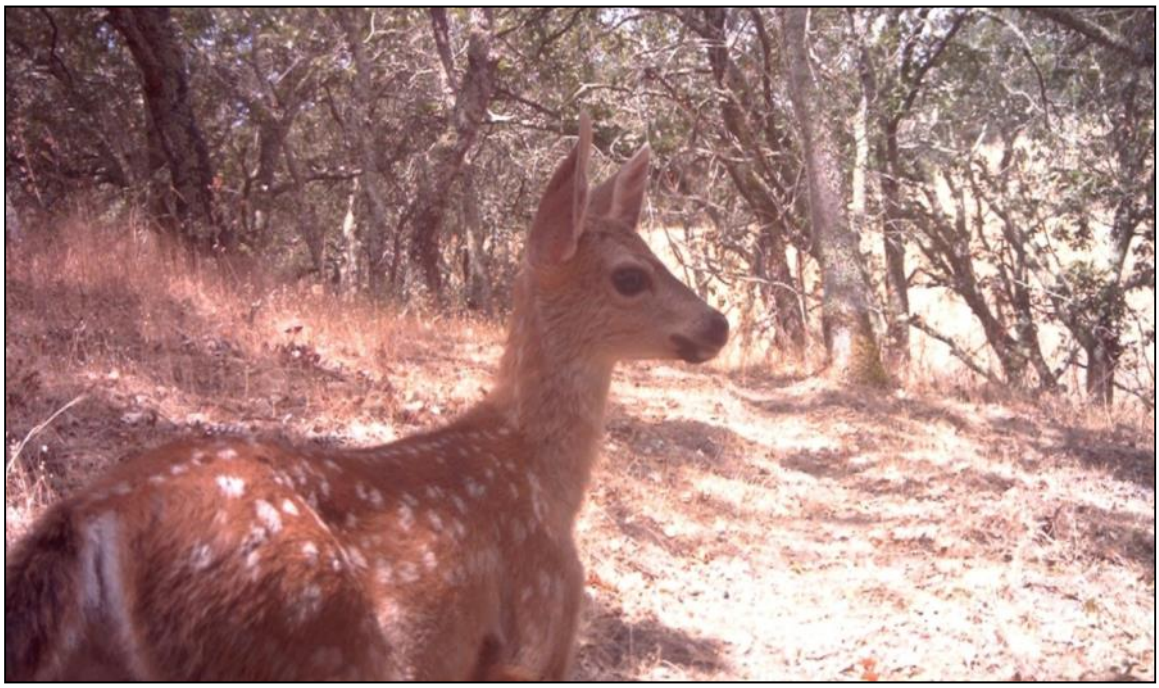
In 2013, Sonoma Land Trust initiated the Sonoma Valley Wildlife Corridor Project to ensure the long-term efficacy of wildlife permeability through the Sonoma Valley and beyond. The goal of the project is to assess the permeability of the Corridor, develop a set of management and monitoring recommendations, and protect key properties that provide critical wildlife passage features. Work included a background literature review, resource and permeability assessments, consultation with experts, and installation of motion-activated cameras and continued monitoring of wildlife usage, and ongoing roadkill

observations. In the resulting report, SDC is identified as a critical path in the Corridor and permeability constraints here can have a significant detrimental impact on the function of the Corridor (SLT, 2014).

SLT wildlife camera monitoring stations were established on the east and west side of the valley in areas where the potential for detection of wildlife is greatest, and along developed road and under crossings, as these locations often represent the safest crossings for wildlife. Monitoring began in 2013 and is expected to continue into spring 2015. SDC was included as part of this monitoring effort. Roadkill surveys are also being completed to determine hot spots of animal mortality and whether or not animals are using or avoiding roads to cross through the Corridor.

Results of the monitoring will assess species presence or absence and biodiversity by year and season. Occupancy, a statistical estimate of the proportion of camera stations in an area that are expected to capture individuals of a species in a given timeframe, will be estimated for each species that has sufficient detection levels (SLT, 2014). A complete analysis of the monitoring work has not yet been completed. However, preliminary results from four cameras on the west side of SDC near Fern Lake; and four on the east side between Arnold Drive and Highway 12, as well as a nearby site on Stuart Creek have been provided below (Nelson , 2015).

Wildlife captures have been abundant and have documented all but a few reclusive mammalian species expected to occur in the region. Thus



Black-tailed deer fawn detected by motion-activated camera operated by SLT. Photo by SLT.

far, the most frequently detected species at both SDC and along Stuart Creek is the black-tailed deer. Western gray squirrels have the second and third highest frequency of detection on SDC, on the west and east side of SDC respectively, in comparison to no detections on Stuart Creek. On SDC, gray fox has been the third most frequently detected species in areas near Fern Lake, but has been less frequently detected between Arnold Drive and Highway 12. Gray foxes have frequently been detected on Stuart Creek. Mountain lion, bobcat, and coyote have been detected on the west side of SDC, but only coyote and bobcat were detected on the east side. There have been multiple detections of mountain lion on Stuart Creek.

Interestingly, a single porcupine was recently reported on Stuart Creek—very few porcupines have been reported in Sonoma County so this sighting is especially notable. Other wildlife species captured on the cameras at all sites include raccoon, striped skunk, black-tailed jackrabbit, and non-native opossum and wild turkey. Of particular concern is the high number of detections of domestic/feral cats on both SDC and Stuart Creek; cats can be extremely detrimental to native wildlife. Further analysis of the data will document species diversity, utilization, and movement along the Corridor in these locations.

More recently, the Merenlender Lab completed a connectivity analysis for Sonoma Land Trust with a specific emphasis on SDC (Gray & Merenlender, draft 2015; Appendix E) This analysis focused on the landscape-scale benefits of maintaining wildlife movement through the Corridor and climate change adaptation. The research identified the degree of wildlife permeability on the SDC property using existing statistical models based on carnivorous mammals and bird assemblages while considering existing development densities. The research also describes the benefits of maintaining the connection across the valley to allow species access to a diverse range of climates. Management issues specific to wildlife connectivity are also discussed.

Black-tailed deer captured on wildlife cameras. Photos by SLT.





Results of the study show that large areas of the northern portion of SDC support higher permeability values (0.43-0.47; see Figure 3 below). Overall, 51% of the land supports permeability values ranging from 0.35 to 0.5. These areas are preferentially used by wildlife and offer the greatest opportunity for passage in the absence of additional development. The network of roads, especially Arnold Drive, and the high density of development in the center of the property serves as the greatest obstacle for movement through the property.

The Gray and Merenlender report also addresses the relative importance of SDC in the face of climate adaptation. They found that the SDC corridor is likely to be particularly valuable in terms of access to cooler areas, slower rates of change, and greater climatic diversity

compared to other similarly sized linkages in the North Bay. These results highlight the importance of maintaining connectivity for wildlife and providing them with the greatest opportunity to respond to a changing environment.

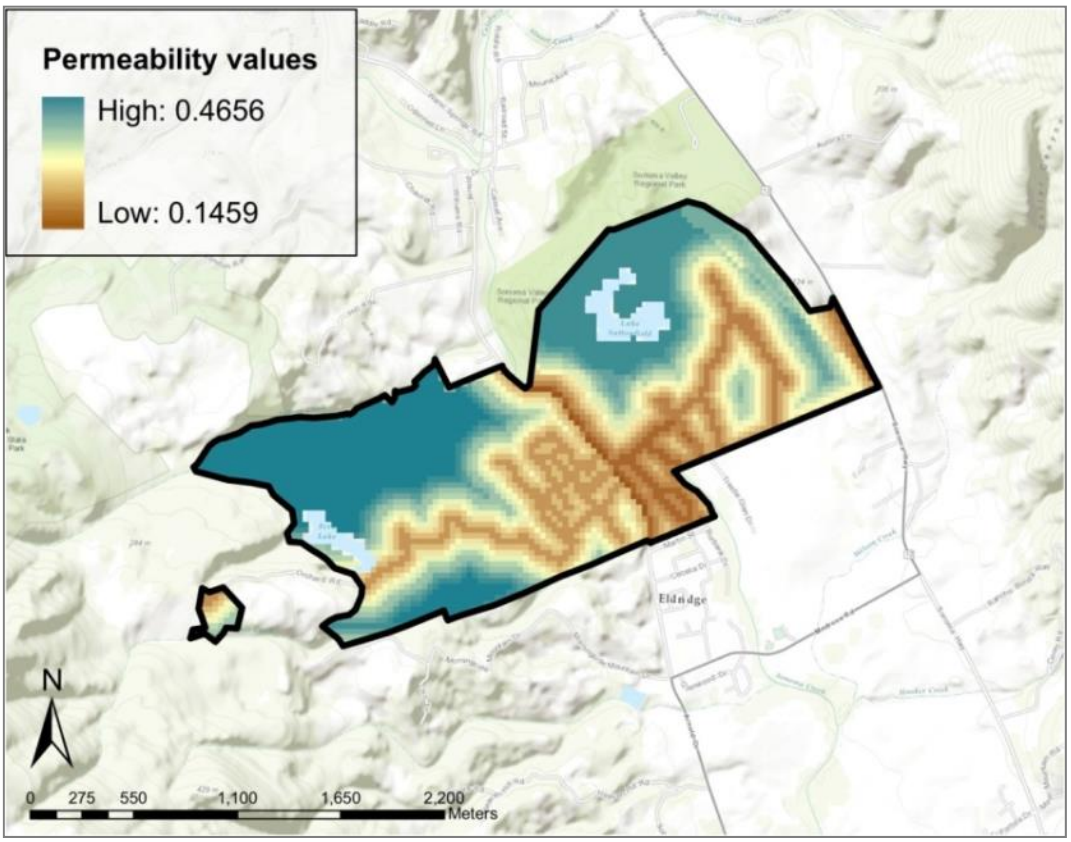


Figure 3. Landscape Permeability Values for SDC

Figure from Gray and Merenlender (draft 2015). A value of 1 indicates a high level of permeability, indicating that wildlife can move easily from one area to another. A value 0.0 indicates low permeability and restricted movement.

Special-status Species

SDC supports habitat or potential habitat for a number of special-status species. Special-status species include plants and animals native to California that are afforded legal protections because they are at risk. These species occur in small isolated populations or in fragmented habitat, show a marked population decline, depend on habitat that has been greatly reduced or is threatened by further loss, or have historical records in the state but no longer persist. These species require careful consideration for resource management actions or land-use changes.

The potential occurrence of special-status species on SDC was determined based on occurrences reported in the California Department of Fish and Wildlife California Natural Diversity Database (CNDDB), the primary source for special-status plant and animal sighting information in the state (CDFW, 2015) and an extensive background and literature review. Special-status species with potential to occur on SDC were identified based on a comparison of existing habitat and microhabitat conditions with species needs, proximity to reported occurrences, and geographic range of subject species. Only those species with documented occurrences and nearby sightings and immediate management needs are included in this report.

*The **California Natural Diversity Data Base** is a repository of information on sightings and collections of rare, threatened, or endangered plant and animal species within California. It is maintained by the California Department of Fish and Wildlife (CDFW). CNDDB reports occurrences of special-status species that have been entered into the database and does not generally include inventories of more common animals or plants.*

***Special-status plants and animals** include those species that are afforded legal protection under the federal and California Endangered Species Acts (ESA and CESA, respectively) and other regulations, including:*

- *Species listed or proposed for listing as threatened or endangered under the federal and California ESA or proposed for listing under the California ESA;*
- *Species that are recognized as candidates for future listing by agencies with resource management responsibilities;*
- *California Species of Special Concern and Fully Protection species classified by CDFW*
- *Plant species, subspecies, and varieties defined as rare or threatened by the California Native Plant Protection Act;*
- *Certain plant species listed by the California Native Plant Society; and*
- *Species that otherwise meet the definition of rare, threatened, or endangered as described in the CEQA Guidelines.*

SDC provides potential habitat for 6 special-status plants:

- *Big-scale balsamroot*
- *Fragrant fritillary*
- *Franciscan onion*
- *Jepson's leptosiphon*
- *Napa false indigo*
- *Narrow-anthered brodiaea*

Special-status Plants

A number of special-status plants have moderate potential to occur on SDC. No comprehensive botanical surveys of the entire site have been undertaken to date, although the northwestern portion of the property was surveyed in 2000 and 2001 (LSA, 2001). Given the presence of high-quality habitat on the property, a complete survey would be beneficial for developing a more complete understanding of the site's botanical resources, and to determine whether any special-status species are present. Exhibit 6 shows locations of special-status plants with CNDDB records in the vicinity of SDC. The following species have moderate potential to occur on the property, based on the habitats and conditions present, and the proximity of other reported occurrences. According to the California Native Plant Society (CNPS), all of these are considered rare, threatened or endangered in California and elsewhere, and fairly threatened in California (Rare Plant Rank 1B.2). The following section highlights the special-status plant species with the most pressing management needs.

Big-scale balsamroot (*Balsamorhiza macrolepis*) – This perennial herb with yellow sunflower-like flowers typically occurs in grassland, chaparral, and woodland, sometimes on serpentine substrates. The species is recorded from near Sonoma, and has moderate potential to occur on SDC in grassland and woodland.

Fragrant fritillary (*Fritillaria liliacea*) – This perennial bulb with a cream-colored flower typically occurs in grassland or scrub settings, often on clay soils and serpentine substrates. It is recorded from the vicinity of Jack London SHP; the generalized mapped area includes the northwestern portion of SDC. This undated occurrence is noted as needing fieldwork. The species has moderate potential to occur on SDC in less-disturbed grasslands, especially where other native grassland species are present and soils are clayey. However, it was not observed in past surveys of the northwestern part of the property (LSA, 2001).

Franciscan onion (*Allium peninsular*e var. *franciscum*) – This bulb-forming perennial typically occurs in grassland and woodland on clay soils, often on serpentine substrate. It is recorded from several nearby locations, and has moderate potential to occur on SDC, especially on clay soils where other native grassland species are present.

Jepson's leptosiphon (*Leptosiphon jepsonii*) – This annual wildflower typically occurs on open to partially shaded grassy slopes, on volcanic soils or the periphery of serpentine substrates. Several nearby occurrences are recorded, including on the west side of Sonoma Mountain. Suitable habitat is present for this species on SDC and it has moderate potential to occur on the property's less-disturbed grasslands,

especially where other native grassland species and volcanic soils are present. A related species, variable linanthus (*Leptosiphon parviflorus)*, was observed north of Fern Lake in the past (LSA, 2001).

Napa false indigo (*Amorpha californica*) – This deciduous shrub species typically occurs in openings or filtered shade within woodland or forest settings, or in chaparral. Several nearby occurrences are recorded, including in Bouverie Preserve. Suitable habitat is present for this species on SDC and it has moderate potential to occur.

Narrow-anthered brodiaea (*Brodiaea leptandra*) This purple-flowered bulbiferous species typically occurs on volcanic substrates within grassland, woodland and chaparral. It is recorded from the Cavedale Road area, and has moderate potential to occur on SDC's grasslands, especially on volcanic substrates where other native grassland species are present.

Other special-status plant species that occur in the SDC vicinity (Exhibit 6) but are not likely to be present on the property due to a lack of suitable habitat include vernal pool species [dwarf downingia (*Downingia pusilla*), legenere (*Legnere limosa*)] and chaparral and knobcone pine species [Cobb Mountain lupine (*Lupinus sericatus*), Sonoma canescent manzanita (*Arctostaphylos canescens* ssp. *sonomensis*)]. A historic (1939) occurrence of Sonoma ceanothus (*Ceanothus sonomensis*) is recorded on Trinity Mountain, and the generalized map area for this occurrence includes the eastern edge of SDC. However, this species typically occurs in chaparral and thus is not likely to occur on SDC itself.



Narrow-anthered brodiaea found in Sonoma County and potentially occurring on SDC.

Special-status Animals

SDC provides documented habitat for:

- *1 special-status reptile*
- *22 special-status birds*
- *1 special-status fish*
- *1 special-status invertebrate*

and potential habitat for:

- *2 special-status amphibians*
- *9 special-status mammals*

The following descriptions include those special-status animals observed on SDC lands, species identified as having a high potential for occurrence, and/or species of historical significance. In addition, there are a number of special-status birds and mammals documented on the property or with potential to occur there, these species are indicated in Appendices C and D, but not described below. The focus of this section is to highlight the wildlife and fish species with the most pressing management needs. The presence of these species makes the protection of SDC's resources especially important.

Northern Western Pond Turtle (*Emys marmorata*)
Status: California Species of Special Concern

The western pond turtle, the only native turtle in Northern California, reaches up to 8 ½ inches in length. These turtles are most commonly found in or near permanent or semi-permanent water sources in a variety of suitable habitats below 4,700 feet elevation. This omnivorous species requires basking sites, such as emergent logs, rocks, mud banks, or mats of aquatic vegetation, for thermoregulation. Underwater retreats are also required for predator avoidance. Nesting sites of this species have been found some distance, up to 1,300 feet or more, from aquatic habitat. Three to 14 eggs are laid in shallow holes dug by the female from April through August. Nest sites include, but are not limited to, areas with sparse vegetation of short grasses and forbs, in hard-packed clay or silt soils, and along south- or west-facing slopes (Bettelheim, 2005). Eggs hatch in late summer or fall, but the juveniles remain buried until the following spring; thus, nests are vulnerable to trampling year-round. Pond turtles have also been found using upland sites for aestivation and overwintering. They are dietary generalists consuming a variety of food items including aquatic invertebrates, carrion, and vegetation. Pond turtles experienced a population decline across their range due to commercial hunting during the late 1800s and early 1900s when they were harvested for use in soups and stews. Continued threats to this species include loss and degradation of habitat and widespread introduction of non-native predators including bullfrogs and fish.

Special-status pond turtle found within Sonoma County.



Local Occurrence: Both reservoirs on SDC and mainstem Sonoma Creek support suitable habitat for pond turtles. This species is known to occur well upstream of the SDC near Oakmont (CDFW, 2015). Two turtles were observed in November 2014 in Fern Lake during a citizen science wildlife survey. These were likely northern western pond turtles, as Hunn (2015) reports they lacked the striping and coloration of introduced red-eared slider.

California Red-legged Frog (*Rana draytonii*)
Status: Federally listed as threatened and California Species of Special Concern

The California red-legged frog is the largest native frog in the western U.S. with females reaching up to 5¼ inches in length and males being slightly smaller. They are most common in marshes, streams, lakes, reservoirs, ponds, and other water sources with plant cover. Breeding occurs in deep, slow-moving waters with dense shrubby or emergent vegetation from late November through April. Floating egg masses are attached to emergent vegetation (e.g., Typha sp. or Scirpus sp.) near the water's surface. Tadpoles require 3½ to 7 months to attain metamorphosis. During the non-breeding season, California red-legged frogs can remain at the breeding site (in the presence or absence of water) or move into surrounding non-breeding habitats. Radio tracking of frogs in Marin County found that frogs disperse at a median distance of 500 feet from breeding sites (range of 100 to 4,600 feet) and make year-round small-scale (<100-foot) movements around breeding sites (Fellers & Kleeman, 2007). These results indicate the importance of uplands for non-breeding season and migratory corridor habitat. Adults eat invertebrates and small vertebrates. Larvae are thought to be algal grazers. Primary threats to this species include loss and degradation of habitat and non-native predators (USFWS, 2002).

Special-status California red-legged frog (top) and foothill yellow-legged frog (bottom) found in Sonoma County.





Local Occurrence: Suitable habitat for California red-legged frogs is present on SDC. Both reservoirs provide suitable breeding habitat and all of the creeks provide foraging habitat and migration routes. However, the presence of non-native fish and bullfrogs in the reservoirs may be precluding frogs from successfully breeding on the property. Frogs have been reported on District-owned lands on the north slope of Sonoma Mountain (PCI, 2012), Fairfield Osborn Preserve, and Annadel State Park (CDFW, 2015). Focused surveys at Jack London Lake in the adjacent Jack London SHP have not found any frogs, although suitable habitat is present (Fawcett, 2011). All wetland features on the property warrant further evaluation.

Foothill Yellow-legged Frog (*Rana boylii*)
Status: California Species of Special Concern

The foothill yellow-legged frog is found in or near partly shaded rocky streams from near sea level to 6,300 feet in a variety of habitats. Breeding generally occurs from mid-March to early June after high winter flows have subsided. Egg masses are attached to the downstream side of rock and gravel in shallow, slow, or moderate-sized streams. Tadpoles require three to four months to attain metamorphosis. Adults take aquatic and terrestrial invertebrates, and tadpoles graze along rocky stream bottoms on algae and diatoms.

During all seasons, this species is generally found in or within close proximity to streams. Primary threats to this species include water management practices, non-native predators, pesticides, recreational activities along streams, habitat loss, and disease.

Local Occurrence: Foothill yellow-legged frogs are known to occur within tributaries to Sonoma Creek and suitable habitat on SDC may be present. Most recently, PCI observed frogs in the summer of 2014 in Stuart Creek, a Sonoma Creek tributary to the northeast of SDC, under similar habitat conditions. They have also been recently sighted in tributaries on the west side of Sonoma Mountain in Adobe and Copeland Creeks (Wilcox, 2015). LSA (2001) found no evidence of this species, and concluded the presence of non-native predators in Sonoma Creek precluded them from occurring there.

Northern Spotted Owl (*Strix occidentalis caurina*)
Status: Federally listed as threatened and California Species of Special Concern

The northern spotted owl is an uncommon permanent resident of dense forest habitats in northern California and oak and oak-conifer habitats in southern California. This nocturnal species requires dense, multi-layered canopy cover for roosting sites. Spotted owls feed upon a variety of small mammals, birds, and large arthropods. Nest sites include tree or snag cavities or broken tops of large trees. The typical breeding period lasts from early March through June, rearing two young per season. A pair of owls may utilize the same breeding site for five to 10 years; however, they may not breed every year. Individual territories are typically several hundred acres. The spotted owl has experienced a population decline due to the loss and degradation of existing mature and old growth forests and, most recently, the establishment of barred owls in the west. They are a fairly common permanent resident in Sonoma County where they occupy old-growth coniferous forests of redwood, Douglas-fir or pines blended with smaller evergreen hardwoods (Bolander & Parmeter, 2000; Burridge ed., 1995).

Local Occurrence: Suitable habitat of spotted owls is present within the forested habitats on SDC. Established territories are reported in Jack London SHP just outside of the SDC property boundary and on adjacent private lands (Evens, 2009). Spotted owls were also detected in 2000 in redwood habitat along Asbury Creek west of Fern Lake on now State Park land (Evens, 2009). Given the close proximity of reported territories and existing conditions, SDC supports habitat for northern spotted owl.

Bats
SDC supports a wide variety of habitats that provide critical foraging and

roosting habitat for a number of bat species. There are approximately 15 bat species with known occurrences within Northern California, and at least 12 of these species have a high probability of occurring on SDC. Bats are highly mobile with many being migratory. Foraging habitats range from woodlands, forests, and grasslands to open water. All of our local Sonoma County species are insectivorous and feed by echolocation. Bats use caves, mines, buildings, bridges, tree hollows, and other natural and man-made crevices for roosting. While focused surveys for bats have not been performed on SDC, nocturnal observations, mist netting, or ultrasonic detection are sure to reveal a number of species utilizing the existing habitats or structures, especially given the age and condition of many of the buildings. One special-status bat species has reported occurrences near SDC (pallid bat) and another has high potential for occurrence (Townsend's big-eared bat) (CDFW, 2015). Additional bat species (i.e., hoary bat, fringed bat) identified as having moderate to high priority for conservation by the Western Bat Working Group, may also occur on the property (see Appendix C).

Pallid Bat (*Antrozous pallidus*)
Status: California Species of Special Concern

The pallid bat occupies grassland, shrubland, woodland, and forest habitats at low elevations in California. It can most commonly be found in open, dry habitats with suitable rocky areas for roosting. This species can also be found roosting in caves, crevices, mines, hollow trees, and buildings during the day. Night roosts generally consist of more open areas such as porches and open buildings. Pallid bats feed on large flightless arthropods which they capture from the ground – a unique foraging strategy in comparison with other bat species. The pallid bat is a yearlong resident throughout most of its range. During the non-breeding season, both sexes may be found roosting in groups of 20 or more individuals. Young are born from April to July. As with many bat species, pallid bats are extremely sensitive to roosting site disturbance.

Local Occurrence: Suitable habitat for pallid bats is present in the natural habitats and man-made structures on the property. Pallid bats have been reported in nearby Jack London SHP (CDFW, 2015).

Townsend's Big-eared Bat (*Corynorhinus townsendii*)
Status: California species of special concern; candidate for protection as an endangered species under the State ESA (as of June 2013)

Townsend's big-eared bat occupies low to mid-elevation moist habitats including, riparian, mixed forest, coniferous forest, prairies, and agricultural lands. This species emerges in late evening and forages for small moths and insects which it picks from leaves. Their flight pattern is slow and maneuverable and they are capable of hovering. Roosting sites

include caves, mines, tunnels, buildings, and other man-made structures. Unlike other bat species, Townsend's do not tuck themselves in crevices and prefer open roosts with their fur erect and ears tucked back for optimal thermoregulation. Mating typically occurs in winter with a single young born in May or June. Maternal roosts consist of a small number of females and young, typically less than 100 individuals. Townsend's are a year-round resident in California.

Local Occurrence and Observations: Suitable habitat for Townsend's big-eared bats is present in the natural habitats and man-made structures on the property. There are no reported occurrences of Townsend's in nearby areas, but this is likely a result of under-reporting as they are likely to occur within Sonoma Valley (CDFW, 2015).

Steelhead – Central California Coast DPS (*Oncorhynchus mykiss*)
Status: Federally listed as threatened

Steelhead are anadromous salmonids. They migrate upstream from the ocean during the rainy season, anytime from November to March. They typically spawn (mate and lay eggs) at the downstream edge of pools where cover habitat exists nearby for predator protection. Eggs are laid in a redd, a depression dug into cobble or gravel substrate. Steelhead can migrate out to the ocean after spawning and return in subsequent years to spawn again. Eggs hatch in 30 to 60 days, depending on stream temperatures. The newly hatched fish, alevins, stay in the gravel for a few additional weeks until their yolk sac is absorbed. When they emerge, they seek slow-water areas, often at the stream margins. As they grow bigger, the juvenile fish move into faster water to feed on drifting insects. Juvenile steelhead remain in freshwater streams from one to three years, depending on their rate of growth. Rearing juveniles have many habitat requirements. Most importantly, they need sufficient, cool streamflow to transport drifting insects for feeding and cover habitat, such as undercut banks, woody material, boulders, and deep pools, to hide from predators and areas for refuge during high flows. When juveniles are large enough, they migrate out to the ocean as smolts. During out-migration, steelhead need adequate streamflow to swim past barriers and cover for predator protection.

Juvenile steelhead in Sonoma County. Photo by Brock Dolman.



Local Occurrence: Steelhead are known to occur on the SDC property. Sonoma Creek is a known habitat for this species. Small numbers of steelhead have been reported in Hill and Asbury Creeks. Hill Creek supports two complete fish barriers, and observations have largely been restricted to below Arnold Drive. Asbury Creek supports two partial fish barriers, but fish have been documented in the upper watershed near the diversion structure.

California Freshwater Shrimp (*Syncaris pacifica*)
Status: Federally listed and State-listed as endangered

The California freshwater shrimp is a small, 10-legged crustacean occurring in low-elevation and gradient (less than 1%) perennial streams in Marin, Sonoma, and Napa counties. They occur in shallow pools away from the main current where they feed primarily on detritus and, to a lesser extent, on decomposing vegetation, dead fish, and invertebrates. Most shrimp appear opaque to nearly transparent with colored flecks across their bodies. Females can appear dark brown to purple under certain conditions. Breeding occurs in the autumn, but young do not hatch until the following May or early June. After breeding, female shrimp carry the fertilized eggs attached to their abdominal swimming legs throughout the winter. The freshwater shrimp has been extirpated from many streams and continues to be threatened by introduced predators, pollution, and habitat loss.

Local Occurrence: California freshwater shrimp are known to occur on the SDC property. Sonoma Creek is a known habitat for this species. Local retired CDFW biologist, Bill Cox, has surveyed the SDC reach and habitats immediately upstream and downstream and found shrimp to be fairly abundant (Cox, 2014). Portions of Hill and Asbury Creeks appear suitable to support this species and should be considered important habitat (LSA, 2001).





Suitable California freshwater shrimp habitat on Sonoma Creek within SDC and shrimp from Sonoma County. Photo of habitat by Bill Cox.

7 Cultural and Historical Resources

The SDC property and the surrounding lands have a rich history of use by Native Americans and European settlers. Over the years, archaeologists have studied the property to identify cultural resources and to determine their significance based on their eligibility for listing on the California Register of Historic Resources. The studies have included background research, including a review of the records held at the Northwest Information Center of the California Historic Resources Information System at Sonoma State University, and field investigations. This section is based primarily on the archival research and report written by Tom Origer & Associates in 2015 (Tom Origer & Associates, 2015). Information from the Anthropological Studies Center's (2013) report for the Sonoma Mountain Ranch Preserve and LSA's Sonoma Development Center Upper Watershed Land Use Alternatives (2001) report were also used. The Tom Origer & Associates (2015) report is included as Appendix F.

Ethnographic Review

At the time of European settlement, SDC was included in the territory controlled by the Coast Miwok (also known as Southern Moquelumnan). The people collectively called the Coast Miwok by ethnographers were actually several distinct sociopolitical groups who spoke dialects of the same Penutian language. The speakers of the Coast Miwok language occupied a territory centered in present-day Marin and adjacent Sonoma County. The primary sociopolitical unit was the village community, which was overseen by one or more chiefs.

The Miwok were hunter-gatherers who lived in rich environments that allowed for dense populations with complex social structures. They settled in large, permanent villages about which were distributed seasonal camps and task-specific sites. Primary village sites were occupied throughout the year and other sites were visited in order to procure particular resources that were especially abundant or available only during certain seasons. Sites often were situated near fresh water sources and in ecotones where plant life and animal life were diverse and abundant. After European contact, Coast Miwok society was severely disrupted by missionization, disease, and displacement.

Prehistory Overview

Archaeological evidence indicates that human occupation of California began at least 11,000 years ago. Early occupants appear to have had an economy based largely on hunting, with limited exchange, and social structures based on extended family units. People lived in small, highly mobile groups, moving through broad geographic areas. Later, milling

technology and an inferred acorn economy were introduced and people gradually became more sedentary, and the population grew and expanded. Sociopolitical complexity and status distinctions based on wealth are also observable in the archaeological record, as evidenced by an increased range and distribution of trade goods (e.g., shell beads, obsidian tool stone), which are possible indicators of both status and increasingly complex exchange systems. Numerous small villages began to develop in the North Coast Ranges during this time period.

Social complexity developed toward a settlement pattern of large, central villages where political leaders resided (Anthropological Studies Center, 2013). The bow and arrow was developed during this time period along with diverse beads and ornaments. Archaeological sites from this period are common throughout the North Coast Ranges, and they include rock art, stone-manufacturing debris, mill equipment, and other evidence of larger occupation sites.

The Yukian language group is generally thought to be the earliest human inhabitants of the North Coast Ranges. This linguistic group includes the Northern Yukian subdivision (itself divided into Yuki, Huchnom, and Coast Yuki dialects) and the Wappo dialect. With respect to the Russian River and Napa valleys, it is likely that the dominant language family of the area was Yukian until the introduction of Hokan (Pomo) linguistic groups which moved south and west from the Clear Lake region around 5,000 to 3,000 years ago. Moratto (1984) suggests that this expansion may have caused the linguistic split which separated early Wappo from the other Yukian languages.

However, it is generally understood that the Utian (Miwok and Costanoan) language family dominated the San Francisco Bay Area by about 3500 B.P. Approximately 3,000 years ago, the Utians began expanding north and east toward the Wappo. As the Miwok moved inland and the Pomo moved down from Clear Lake into the Russian River Valley, Wappo borders were likely pushed back and settlements absorbed until the Wappo established their historically recognized range within the Napa Valley and Southern Clear Lake at the point of European contact. The distribution of obsidian sources changed around the suggested period of Pomo and Miwok incursion. Obsidian in the Santa Rosa and Sonoma sub-regions shows a change from primarily Napa Valley source to mixed Napa Valley and Annadel sources. This provides evidence that the people inhabiting the different sub-regions had uneven access to resources and were potentially linguistically and culturally distinct.

It appears that very early in time the SDC property would have been inhabited by people speaking a Yukian language, ancestral to modern Wappo. Pomo speakers might have been in residence ‘briefly’ from

about 1,200 years ago until roughly 550 years ago, when the Miwok moved in.

All of these groups had similar cultures, with activities that included hunting, gathering of plant materials for food and for making tools and clothing, building houses, and living in temporary camps. The environment of the SDC property is such that all of these activities could have been successfully pursued, and archaeological sites representing these lifeways would be expected.

Historical Period

Cultural resources survey work has found features that relate to three primary uses of the property as a whole, which relate to supporting the function of the SDC as a care facility: water control structures, farming, and redwood harvesting. There are a variety of water control structures to supply SDC dating back to the 1890's when the center was first established. They include Fern Lake, dams, springs and spring-boxes, water channels and weir boxes, pipes, earthen and concrete canals, culverts, trestles, bulkheads and gate valves.

A working farm was operated by residents, and there are remnant orchards from the 1890's and early 1900's in the western portion of the original property, which is now part of Jack London SHP. Other agricultural items observed during previous work include rock piles, deer fences, a disker, two farm trailers, and an apple box. Camp Via was originally part of the orchard operation, and was later converted to a retreat area for residents.

There are locations that show evidence of redwood harvesting, but this does not seem to have been a major activity on the property. The timber harvesting may predate the State's acquisition of the property, and be more related to Vallejo's saw mill to the north. There are also locations with collections of basalt rocks that do not have a clear association with a specific activity.

Potential for Cultural Resources

There are two recorded sites on the property, and there is high potential to discover more sites given prehistoric and historic land uses. LSA (2001) completed a cultural resources study of the 600-acre western portion of the SDC property in 2001 as part of a Land Use Feasibility Study conducted on behalf of the State of California. Chambers Group evaluated improvements along Asbury Creek in 2008 as part of an Asbury Creek Improvement Project (Crews, 2007; Crews et al., 2008). These studies covered approximately 40 percent of the current SDC property. Results of these identified two previously

recorded prehistoric sites, and background research also indicated that the potential for the presence of other prehistoric and historic resources is high for the property. Field surveys identified numerous cultural resources in the area studied. The resources were placed into 13 general categories: 1) water control canals and dams, 2) agricultural (orchards), 3) prehistoric sites, 4) lumbering (cut redwoods), 5) rock features possibly associated with orchards or prehistoric occupation, 6) roads, 7) paleontological remains (petrified wood), 8) wooden retaining walls, 9) Camp Via, 10) quarry, 11) trash dump, 12) U.S. Army Corps of Engineers Camp north of Fern Lake, and 13) fencing. These resources have not been evaluated to determine the significance and eligibility for the California Register of Historic Resources, nor have the resources been evaluated to determine the overall historic values of the SDC.

Tom Origer & Associates (2015) completed an archival database search of the SDC property and identified three prehistoric archaeological locations within the study area, three fossil localities, and a variety of historical era structures, including dams, sediment basins, a quarry, fence lines, and water control structures. The study found that the possibility of finding prehistoric archaeological resources on the remaining 60 percent of the SDC property is moderate to high. Indications are that the area provided a variety of micro-environments that supported diverse plant and animal life and ample fresh water supplies for Native Americans and European settles to live in the area. Resources already identified on the 40 percent of property covered in more detailed studies suggest that it would be reasonable to find an additional four to six prehistoric sites on the remainder of the property, and an array of historical structures related to early development of the property.

8 Services and Facilities



Looking east at SDC's Core Campus. Photo by Scott Hess, SLT.

Services at SDC

SDC is now one of four State-run developmental centers operated by the California Department of Developmental Services and managed by the Department of General Services (DDS, 2015b). DDS's current mission is to "meet the needs of people with developmental disabilities by providing an extensive array of services that promote ongoing health, learning, self-advocacy, and increased independence. Innovative social, recreational, educational, vocational, and other programs are continuously offered" (DDS, 2015a). While support services for developmentally disabled persons are now focused on smaller, community-based and home-based programs, SDC continues to provide many services not available elsewhere in the region. At one time, the facility was Sonoma County's largest employer (LSA, 2001); and continues to provide employment opportunities in the Sonoma Valley.

Currently, SDC provides housing, care, and other services for approximately 417 individuals with intellectual and/or developmental disabilities (DDS, 2015b). This includes around-the-clock medical, nursing, and behavioral care for its residents, a pharmacy, dental services, and medical equipment. Approximately 10 to 20% of the patients are residents of Sonoma County. Clients range in age from 25 to 90; the average client age is 56 (PHA, 2015). Three percent of patients are 22 to 31 years old, 9% are 32 to 41, 21% are 42 to 51, 39% are 52 to 61, and 28% are over 62. Many of the elder residents have

been at SDC for most of their lives. Due to an existing moratorium on new admissions, there have been no new residents admitted in the past several years.

In addition to supporting the daily and medical needs of the residents, SDC provides a variety of enrichment programs. Many clients participate in day programs ranging from education to working at the recycling facilities at Sunrise Industries. Throughout the year there are a number of events put on specifically for the residents and others for the community at large. Each year, SDC has an annual tree lighting and holiday craft fair to support those client services not funded by the State; a Halloween celebration and parade with a carnival and activities; a Mardi Gras celebration; a black and white ball, a 4th of July celebration with fireworks, music, and a carnival, and annual horse show.

Residents of SDC put on an annual fashion show in the spring, dressing up in many of the costumes and clothes donated and available from the clothing center and modeling them for family, friends, and staff. The Eldridge Performing Arts Center brings together clients and staff to put on a musical production each year. SDC residents and staff come to cheer on the racers each spring at the Sonoma Valley Footrace and Festival held at SDC. This event includes a running race, car show, food, vendors, and games. SDC offers many services that enrich the lives of the residents and engage the larger community (PHA, 2015).

The Professional Education Building on SDC. Photo by Scott Hess, SLT.



Facilities

SDC's campus includes a mixture of building styles and configurations that represent the long history of development on the property. The central Core Campus covers approximately 128 acres and consists of approximately 130 structures, and is located on both sides of Arnold Drive, west of Highway 12 (Exhibit 7). To the east and west of the Core Campus, there are approximately 38 additional structures including those at Camp Via, the wastewater treatment facility and storage tanks, and several farm complexes (Exhibit 7).

The tables provided at the end of this section include a summary of the buildings on the property; Table 1 (DDS, 2012; PHA, 2015), and the location, year built, use, and size of the buildings outside of the Core Campus; Table 2 (DDS, 2012).

The oldest buildings on the property date back to 1897, including three residences; two of these are rented and the third is vacant. The Professional Education Building, the three-story brick building that is the focal viewpoint as you enter SDC from Arnold Drive along a palm-lined street, was constructed in 1908. In its original condition, it housed a kitchen wing, bakery, laundry, and engine boiler and boiler room. This English Gothic building was placed on the National Register of Historical Places in 2001. Unfortunately, it is now condemned and no longer in use. Many of the other older buildings reflect a similar English architectural style. A number of the original buildings have been removed over the years due in part to earthquake damage, but approximately 50 buildings dating prior to 1948 still remain (Myra L. Frank & Associates, Inc., 1998).

Over the years, many more buildings were constructed on the property to house the growing population of clients. Currently, the SDC campus includes residences, medical and clinical buildings, protective services, administrative, and classroom buildings, plant operations shops, and other infrastructure. The majority of the residential facilities are located to the east of Arnold Drive along with medical and clinical services in the Nelson Treatment Center, a hospital for residents, located off of Taxler Drive.

The Eldridge Fire Station is housed on the property and responds to the needs of SDC as well as those of the surrounding community. There is a fully staffed State police department that focuses primarily on ground patrol and special investigations, and a motor pool complex that houses and services all of the equipment and vehicles. A large steam boiler system is used for many of the buildings within the Core Campus; all of the houses have independent heating systems. At one point, there was a turbine electric engine that generated the facility's electricity, but it is

no longer in use. The central kitchen prepares the majority of the clients' meals. In addition, all of the residences are equipped with supplemental kitchens (Sutton, 2015).

SDC has a clothing store, First Impressions and Second Impressions, which offers residents both new and used clothes and accessories. There is a carousel within the Core Campus that was renovated approximately 5 to 7 years ago, but it has not been used by the facility since children were being treated in the 1980s. Additional facilities at SDC include a school building, gym, US post office, barbershop, swimming pool, and a store/cafeteria open to the public. A local branch of the Redwood Credit Union is housed on the property as well. A client-run nursery provides ornamental and native plants.

In addition to basic facilities, there are several outdoor sports areas including a soccer field, which is reportedly no longer in use, a lighted baseball field used regularly by the community, and a ropes challenge course near Fern Lake, and Camp Via (see *Recreational Facilities* below) (Miller, 2015). Open space surrounding the Core Campus includes an extensive network of trails and unpaved roads used by SDC staff and the public; some residents use these areas under supervision (see *Recreational Facilities* below).

On the east side of the property of off Sunrise Road are several farm complexes (Myra L. Frank & Associates, Inc., 1998) (See *Recreational Facilities* below for additional information). East of Eldridge Farm is the area known as Sunrise Industries, originally a dairy farm. The old dairy/milk house, stalls, and outbuildings are now used for furniture, hazardous material, and plant operation storage. An on-site recycling facility is used as part of the day program to provide employment for residents, who sort and break down the facilities' recyclables. The old calf barn is used as an indoor horse arena. A number of buildings in the area are in poor condition and not in use. Fenced pastures are leased to SDC employees and local residents who board their horses. Residents interact with some of the horses on the grounds and there are areas where individuals in wheelchairs can pet the animals.

The southeast corner of the property includes the John Mesa complex and a street of the same name. John Mesa was a Native American and former resident of SDC. He was admitted to the facility as a child and lived there well into his 90s. The complex includes several residential buildings, poultry sheds, a large red barn, and a soccer field that is used by the community. The residential buildings served as former staff housing and are now empty. The remaining buildings are used for fire department storage or are empty and/or in poor condition.

A number of buildings and facilities occur to the west of the Core

Campus along Orchard Road. The first developed area to the west of the campus is the historic cemetery, with graves dating from 1889 to 1962 (Sutton, 2015). Further to the west is a corporate storage yard used for plant operation materials. Challenge Sonoma operates a ropes course near Fern Lake (Challenge Sonoma, 2015). Camp Via is located approximately 0.6 miles west of the Core Campus at the end of Orchard Road. See *Recreational Facilities* below for additional information.

SDC's water treatment facility is located mid-way between the Core Campus and Fern Lake. The facility includes a 1-million gallon storage tank and a 350,000-gallon tank. Two additional storage tanks are located near Lake Suttonfield for finished water storage (Barber et al., 2012). The facility supports a self-contained water diversion and treatment facility and two reservoirs for water supply. See *Water Supply System* and *Sanitation and Stormwater Systems* below.

Table 2. SDC Building Use Summary

Building Identification	Square Footage	% of Developed Area
Residences	469,737	35
Medical/Clinical	106,252	8
Protective Services	7,193	1
Office/Administrative	140,982	11
DTAC/Central Program Services	160,128	12
Main Kitchen	54,554	4
Employee Housing	49,213	4
Outbuildings	109,334	8
Storage Containers/Sheds	6,864	1
Plant Operation Shops	134,147	10
Plant Operation Infrastructure	39,469	3
Vacant	63,605	5
Total	**1,341,478**	Exceeds 100% due to rounding

Source: DDS (2012)

Table 3. Building Inventory on SDC Outside of Core Campus

Building Identification	Location	Year Built	Use	Gross Square Footage
East of Core Campus				
Residence 134	John Mesa St.	1908	Staff housing – empty	1,680
Residence 152	John Mesa St.	1907	Staff housing – empty	1,750
Horse Barn	Sunrise Road	1948	Horse barn – horses belong to SDC employees	7,500
Horse Barn/Tack Room	Sunrise Road	1950	Horse barn- horses belong to SDC employees	4,800
Jr. Farm Area – Old Slaughter House	Sunrise Road	1950	Vector control storage – empty (building condition poor)	1,378
Jr. Farm Feed Barn	Sunrise Road	1939	Farm – animals kept	4,616
Jr. Farm Shed	Sunrise Road	1939	Farm	308
Jr. Farm Storage Shed	Sunrise Road	1950	Farm storage	924
Sunrise Building 1 – Old Dairy/Milk House	Sunrise Road	1980	Recycling/furniture storage (building condition poor)	11,754
Sunrise – Calf Barn	Sunrise Road	1949	Indoor horse arena	2,698
Sunrise Building 2 – Old Dairy Barn (stalls)	Sunrise Road	1942	Furniture storage	4,726
Sunrise Building 3	Sunrise Road	na	Empty (building condition poor)	4,500
Sunrise Area – Satellite TV/Barn 5	Sunrise Road	1965	CPS storage	7,500
Sunrise Building 6 – Paper Baling Barn	Sunrise Road	1987	DTAC – not used	7,700
Sunrise Building 7 – DTAC	Sunrise Road	1986	DTAC classroom (modular building)	5,088
Sunrise – Hazmat Storage	Sunrise Road	1981	Hazardous waste storage – metal building	1,824
Sunrise Storage Barn #1 (Pole Barn)	John Mesa St.	1968	Plant operations storage – carpentry and electrical	7,500
Sunrise Storage Barn #2 (Pole Barn)	John Mesa St.	1968	Property storage (furniture)	10,945
John Mesa Area – Connecting Red Barns	John Mesa St.	na	Storage – mostly empty	9,000
John Mesa Area – Poultry Shed #1	John Mesa St.	1980	"Old Research Barn" – storage for Fire Dept	1,440
John Mesa Area – Poultry Shed #2	John Mesa St.	1940	Storage (building condition poor - falling down)	10,075
Landscape Office Building/Nursery Room	John Mesa St.	1950	Plant operations shop	1,500
Landscape Greenhouse	John Mesa St.	1950	Empty - not used (building condition poor)	1,500
Landscape Storage Bldg.	John Mesa St.	1939	Landscape tool storage	2,370
Landscape/Storage ("L" shaped building)	John Mesa St.	1939	Landscape mower storage	6,443

Building Identification	Location	Year Built	Use	Gross Square Footage
West of Core Campus				
Camp Via Employee Restroom	Orchard Road	1961	Camp	72
Camp Via Employee Picnic Restroom	Orchard Road	1961	Camp	384
Camp Via Shower Room	Orchard Road	1961	Camp	320
Camp Via Dinning Hall	Orchard Road	1961	Camp (office has some furniture)	1,560
Camp Via Restroom #1	Orchard Road	1961	Camp	320
Camp Via Restroom #2	Orchard Road	1961	Camp	320
Corporation Yard Shed 1	Orchard Road	1923	Plant operations storage	312
Corporation Yard Shed 2	Orchard Road	1923	Plant operations storage (plumbing)	500
Corporation Yard Building	Orchard Road	1923	Plant operations storage (old parts)	1,270
#1 Domestic Water Storage	Orchard Road	1923	Facility water	4,800
#2 Domestic Water Storage	Orchard Road	1923	Facility water	8,400
Water Treatment Plant	Orchard Road	1938	Facility water	2,832
Water Treatment Storage	Orchard Road	1932	Facility water	120

Phase 1 Assessment

West Yost & Associates (2015) completed a Phase 1 Environmental Site Assessment (Phase 1) to identify the presence or likely presence of any hazardous substances or petroleum products on the SDC property due to hazardous material releases or potential future releases and to identify known sites on surrounding properties to determine if hazardous materials could move through the groundwater to the SDC property. The complete assessment is included as Appendix G, and a summary is provided below.

The Phase 1 Assessment includes a compilation of the SDC site history, relevant agency files, and a list of facilities with recorded environmental issues on the SDC property and on surrounding properties. The assessment evaluated two main areas of the SDC property: the water treatment plant west of the main campus and the farming areas east of the main campus because these locations had the potential for discover of hazardous materials. The assessment areas are shown on Figure 1 in Appendix G, Preliminary Draft, Phase 1 Environmental Site Assessment. The Core Campus was not included in the Phase 1.

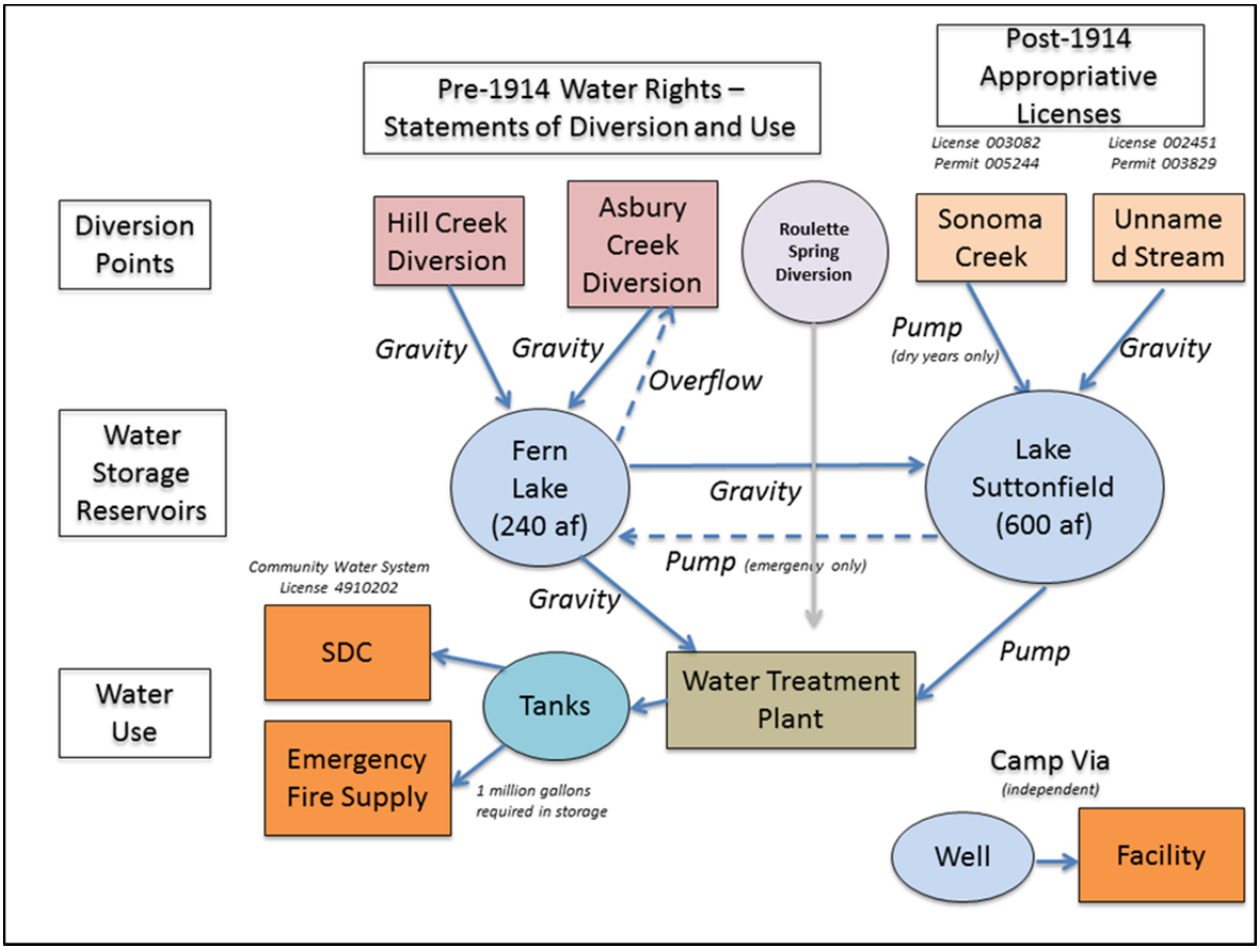
The water treatment plant area includes the treatment plant, two water storage tanks, a campground, campground facilities, and a corporation yard with buildings. Two buildings at the corporation yard currently store hazardous materials. The farming areas consist of barns, poultry sheds, staff residences, and landscaping facilities. One building stores hazardous waste and three others store materials for plant operations which could house hazardous materials. No record of hazardous materials releases were identified at any of the sites during review of the information available. Nonetheless, the threat of release could not be ruled out without field verification. Field verification and interviews would be necessary to determine the potential future risk of contamination from the four sites (one building that currently stores hazardous material and three buildings that store materials for plant operations) on the SDC property.

The assessment identified three known hazardous material release sites on properties adjacent to the SDC or on the main campus. The vehicle maintenance building on the main campus had three leaking underground buried tanks; two were removed in 1988 and the third removed in 1999. Cleanup activities resulted in a “No Further Action” status in September 2013, and the site does not pose a risk of offsite contamination to the SDC property. The other two sites were either remediated or are too far away from the SDC to result in offsite contamination.

Water Supply System

Sonoma Developmental Center has a self-contained water supply, treatment, and distribution system. The details of this system, including information on water availability and quality, are thoroughly described by the Sonoma County Water Agency's *Review of Water Resources for Sonoma Developmental Center Technical Memo* (2015) in Appendix H. The flow chart below provides a general overview and schematic of the different components that comprise the SDC water system. Camp Via has a small stand-alone water supply well and treatment system. In case of emergencies, SDC maintains connections to the Valley of the Moon Water District and the Sonoma County Water Agency's Sonoma Aqueduct.

Current SDC water system schematic (adopted from Barber et al, 2012).



Water Supply

SDC's potable water supply comes from multiple surface sources. In addition, there is one shallow groundwater well that is used only for turf irrigation on the eastern portion of the property. Water for potable and non-potable uses comes from in-channel diversions on Asbury, Hill, and Sonoma Creeks, and a collection box at Roulette Springs (Exhibit 7). The

New Year's Eve flood of 2006 severely damaged both the Hill and Asbury intake structures. The Hill Creek structure was repaired in 2007, while the Asbury structure had to be completely redesigned and was constructed in 2011.

On the west side of the property, the Asbury Creek and Hill Creek diversions gravity feed to Fern Lake, while water from Roulette Springs is sent directly to the treatment plant. Roulette Springs is the only source of the three that is year-round. The two tributary diversions are typically limited to the November through May period. These three sources provide the majority of SDC's water. On the east side of the property an unnamed tributary feeds into Lake Suttonfield. If needed, a diversion on Sonoma Creek can pump water into Lake Suttonfield, the treatment plant, or Fern Lake. See Exhibit 7 for a map showing the location of the diversions.

Water Rights

All the surface water diversions and storage reservoirs that comprise the SDC water supply system are subject to state water law. For three of the diversions – Hill Creek, Asbury Creek, and Roulette Springs – SDC has claimed pre-1914 appropriative rights, and in 2010 filed statements of diversion and use with the State Water Resources Control Board, Division of Water Rights. The other two diversions – Sonoma Creek and the unnamed tributary flowing into Lake Suttonfield – are licensed under appropriative right applications to divert to storage between November 1st or December 1st and May 1st.

Water Treatment

Water is transferred to the treatment plant by gravity from Fern Lake and Roulette Springs. When needed, water is pumped from Lake Suttonfield or the diversion on Sonoma Creek. Water can also be pumped from Lake Suttonfield to Fern Lake or transferred by gravity in the opposite direction, allowing the raw water storage reservoirs to be operated conjunctively. SDC's water treatment facility is located mid-way between the Core Campus and Fern Lake. Water is processed for potable use with a series of pre-treatments and is then sent through rapid sand filters for finishing prior to chlorine disinfection and pH adjustment.

The water treatment plant was originally built in the 1930s, with an upgrade in 1950 to increase storage and the number of sand filters. In 1995 it underwent a major upgrade that modernized the system and installed fully automated operational controls. The treatment plant has a design capacity of 1,260 gallons per minute (1.8 million gallons per day). It is classified as a small public facility by DDW.

Water Distribution

Treated water is distributed to a total of 123 connections, which serve a population of approximately 500 residents and 1,000 staff. None of the connections are metered, as they are all on-site hook ups.

Four welded steel water tanks are used in the system to store and redistribute treated water to the connections. Two tanks are at the treatment plant and two are across Sonoma Creek and Arnold Drive on the eastern portion of the campus. All the tanks operate in a single pressure zone and all delivered water is gravity fed. Total storage capacity is 2.05 million gallons.

Sanitation and Stormwater Systems

Sanitation System

SDC is part of the Sonoma Valley County Sanitation District (SVCSD). SCVSD is the largest county sanitation treatment plant and provides state-of-the-art tertiary treatment. It serves the city of Sonoma and surrounding unincorporated areas, including SDC. The sanitary sewer system on SDC was installed from the 1920s to the 1960s (Vanir, 1998). An upgrade to the system, relining and piping replacement, was completed sometime in the 1990s; however, this needs verification.

Treated wastewater from the facility meets the highest level of treatment defined by the State of California and can be used in virtually all recycled-water applications. Water is discharged into Schell or Hudeman Slough into San Pablo Bay during the wet season and used for irrigation and wetland habitat enhancement other times of the year.

According to a site assessment, piping materials are cast iron in the buildings and buried vitrified clay throughout the campus (Vanir, 1998). Vanir (1998) reports that drainage is adequate and there are no reported problems related to system age and maintainability and that the existing system is adequate to handle the foreseeable demand.

Barber et al. (2012) reports that the main sewer pipeline from Glen Ellen to the treatment facility runs down Arnold Drive and crosses Sonoma Creek in several locations. The connection between SDC and the main sewer pipeline warrants further research, as the location(s) is not reported. Because the sewer pipeline is gravity fed and these types of systems tend to leak a little (Barber et al., 2012), there is some risk of contamination with the watershed. This is most likely to occur during large rainfall events when groundwater can seep into the pipe and bubble up at low points.

Stormwater System

Like the sanitary sewer system, the stormwater system was also

installed from 1920s to the 1960s (Vanir, 1998). An upgrade to the system, relining and piping replacement, was completed sometime in the 90s as well; however, this needs verification. The piping system includes buried reinforced concrete throughout the campus. The discharge is reported to be into a municipal storm ditch, but the location of discharge warrants further research. For a property of this size, there are likely multiple discharge points. Vanir (1998) reports that drainage is adequate and there are no reported problems related to system age and maintainability and the existing system is adequate to handle the foreseeable demand.

Roads

SDC includes a network of paved and unpaved access, service and fire roads (Exhibit 8). The unpaved access roads were originally graded and maintained to facilitate fire protection, access water tanks and other facilities, including the extensive agricultural landscapes that were once a thriving component of the SDC operation. The largest road on the property is Arnold Drive, which bisects the Core Campus for approximately 0.75 miles. Arnold Drive is the only County-maintained road on the property. The remaining roads are owned and maintained by the State. The roads were repaved in the 1990s (Vanir, 1998); further research is needed to determine if any additional repairs have been completed since then.

Within the Core Campus, there is a network of paved roads servicing all of the residences and facilities. These roads run mostly perpendicular and parallel to Arnold Drive. There is only one road leading from the core facility to the west, Orchard Road. This road leads from the southwest corner of the Core Campus west for approximately 1.2 miles. A locked gate at the beginning of the road restricts access to only authorized vehicles, although it is frequently used by walkers. Orchard Road acts as the service road to the water treatment plant and several storage areas and ends at Camp Via. On the east side of the core facility, several roads lead to the agricultural facilities. This loop includes Sunrise Drive and John Mesa Street.

Unpaved roads include the service road leading up and around Lake Suttonfield from Sunrise Drive on the east and Arnold Drive on the west, which together form a 1.8-mile loop. The Fern Lake fire road is approximately 0.75 miles and originates near Fern Lake off of Orchard Road and continues around the lake to the water diversion structure on Asbury Creek.

Recreational Facilities

Trails and Access Roads

Many of the roads are used as informal trails by residents, staff, and the general public. Over time, recreational use of the trails on the property has grown in popularity and they are now actively used by area hikers, dog walkers, equestrians, and mountain bikers, accessed from local public roads and from trails on adjacent state and regional parks (Exhibit 8). Table 4 below summarizes the amount of trails and fire roads on each side of the property.

The management approach towards public access on the property has shifted from an active program to prevent public access to acceptance, perhaps reflecting, in part, the difficulty of controlling access to the property. The first commercially available map of SDC's trails and access roads was published in approximately 2008 by 360Geographics Inc. This map illustrates the extensive connections between SDC and adjacent public parks.

Today, the informal and formal network totals over 15 miles that meander through the undeveloped areas of the property east and west of Arnold Drive and the Core Campus. The trails extend from various points along the perimeter of the facility and from the unpaved access roads.

To the west of the Core Campus, the routes meander up through dense mixed woodlands and open meadows where quick elevation gains afford sweeping valley views to the east. Various routes converge toward Fern Lake where a trail circumnavigates the lake. From there, a trail traverses through the historic orchards, now part of the adjacent Jack London SHP, connecting to the greater network of trails and the historic features in that park, and beyond to the newly opened trails traversing the north and east slopes of Sonoma Mountain.

Directly east of Arnold Drive and north of the Core Campus, an unpaved access road leads up a short rise to Lake Suttonfield. From there, a well-graded trail contours around Lake Suttonfield, offering sweeping views down the valley.

There are approximately six trails that run between SDC and the adjacent SVRP. It is not always clear where the boundary between the two interconnected trail systems is. This can create confusion since there are different regulations that govern each system.

Table 4. Trail and Fire Road Locations and Lengths on SDC

Location	Trails	Fire Roads
West of Arnold Drive	4.0 miles	5.3 miles
East of Arnold Drive	2.1 miles	4.3 miles

Scenic Lakes and Creeks

In addition to providing water storage and serving as important wildlife habitat, the two lakes on the property are also recreational features serving as destinations for hikers and equestrians, providing scenic views and opportunities for wildlife observation. As described above, a combination of trails and unpaved access roads encircle both of the lakes. Although swimming, fishing and other aquatic activities are not permitted, the trails around the lakes are well used.

Fern Lake is located at the upper slope of the west end of the property and is surrounded by mixed evergreen forest area and grasslands. It is possible to circumnavigate the lake using a combination of nearby trails and unpaved access roads, and views vary from open water to surrounding forest. Due to its relatively remote location on the property, Fern Lake receives fewer visitors than Lake Suttonfield on the east side, and because of its proximity to Jack London SHP, is often accessed by people on long hikes or rides from adjacent lands.

Lake Suttonfield, the larger of the two water bodies, sits at a slightly lower elevation between Arnold Drive and Highway 12 to the south of



Hiking trail on SDC. Photo by Scott Hess, SLT.

Sonoma Valley Regional Park. Due to its proximity to Arnold Drive and roads, Lake Suttonfield receives a much higher level of use than Fern Lake. The trails around the lake are frequented by hikers, runners and dog walkers, and to some degree equestrians and bicyclists. During weekday evenings and weekends, the use in the greater Lake Suttonfield area appears similar to SVRP (Ehret, 2015).

In addition to the lakes, three creeks on the property support passive recreation serving as destinations for hikers, equestrians, and bicyclists, and opportunities for wildlife observation. While Sonoma Creek is limited with no formal trails or access points, views and sounds of the creek are available at numerous points including bridge crossings. Nearby trails and unpaved access roads interface with Asbury and Hill Creeks offering seasonally available views and sounds of running water.

Equestrian Facilities

Historically, the complex of barns, out-buildings and paddocks along Sunrise and Dairy Roads were a part of the extensive agricultural use of the SDC property. While many of the structures remain underutilized or have been converted to storage or other uses, the Eldridge Equestrian Center operates out of one of the central barn structures and maintains the actively used riding ring facility. A number of the other barns and several of the paddocks are well used by the community for boarding horses.

The equestrian facilities also support a therapeutic riding program for patients of SDC. Therapeutic riding gives students with disabilities the ability to control a horse as well as one's own body to increase balance, muscle control, concentration, and patience, while instilling responsibility, and teamwork.

Eldridge Farm

The Eldridge Farm, formerly known as the Junior Farm, has been in existence since the late 1960s. SDC staff recognized the potential benefits that the relationship between individuals with developmental disabilities and animals provides, a relationship that fosters personal and social growth, and environmental awareness, as well as unparalleled enjoyment. SDC residents work shifts at the farm and benefit not only from interacting with the animals, but with the public that visits the farm. In a recent survey of parents of SDC residents conducted by Regional Parks, the Farm ranked as the most favorite outdoor area (SCRP, 2014).

In the past, there were "over 100 animals that lived at the farm including llamas, a variety of goats, pigs, ducks, geese, miniature horses, donkeys, Amazon parrots, cockatiels, chinchillas, chickens, roosters, rabbits, cats, guinea pigs, fish, pet rats and a turkey. There are plenty of

picnic tables and 6 zoo-like voice boxes scattered throughout the farm to educate visitors about the animals and their habitats" (PHA 2015). The area currently accommodates horses belonging to SDC employees and local residents, and other small farm animals including miniature horses, llamas, donkeys, and birds. There is an outdoor horse arena next to the farm buildings. In the past the farm received active visitation from SDC residents and the community; many local elementary schools and group homes visited the farm. The number of animals still residing at the farm has dwindled over the years as has visitation by outside groups. The farm is still open everyday from 8 a.m. to 4:30 p.m. Entrance is free, but donations are accepted, and the facility is wheelchair accessible.

Athletic Fields

There are two athletic field areas on the SDC property. The first is the softball field on the northern edge of the main campus adjacent to Arnold Drive. The well-maintained field is lighted and is used by local organizations and clubs as well as informally by the local community. The fields are easily accessible from Arnold Drive and are a valuable asset for SDC and the greater community.

The second field area is located in the south east corner of the property and contains two soccer fields. Otherwise known as John Mesa Park, these fields were developed in 1984. The park-like setting consists mostly of open, poorly maintained fields with gently rolling terrain and includes a long, low barn structure and several mature oak trees. The area remains a popular destination for more able-bodied SDC residents on walks and as well as for employees on break. At one time these fields were used for organized soccer games. Now while maintenance has been greatly reduced, the fields still host occasional informal soccer play by the community, and the east end of the fields has become a de- facto golf driving range. A gravel parking area west of the field accommodates approximately 25 to 30 cars.

Camp Via

Camp Via is located approximately 0.6 miles west of the Core Campus at the end of Orchard Road. It is now surrounded by Jack London SHP and is adjacent to the historic orchard that was once part of SDC. Camp Via is a 40-bed camping facility that at one time provided outdoor activities for residents and staff. There is a well that serves Camp Via, independent from the water system servicing the rest of the facility. Camp Via includes restrooms, a wheelchair swing, wading pool, fire ring, dining facilities, and permanent tent camps. Currently, Camp Via is used as an occasional day-use destination by SDC residents and staff, but not as an overnight retreat. Additionally, the camp is used by trail users for resting, refilling water, picnicking during hikes and horseback rides on

the nearby trails, and as a destination for people walking or riding their bikes up Orchard Road.

Ropes Challenge Course

The privately operated Challenge Sonoma Adventure Ropes Course is operated on the SDC grounds off of Orchard Road on the way up to Camp Via. The non-profit group has maintained and operated the course since 1984 to support school children and youth-at-risk in the Sonoma Valley. The ropes course facility provides experiential training, challenge courses, teambuilding, corporate events and wilderness adventure to a variety of groups.

9 Regulatory Jurisdictions and Policies

There are a number of state and local plans and policies that govern land use and development on the SDC property. Future development and land use changes on SDC would be subject to a range of local, State and federal regulations. This section includes a description of applicable regulations and the agencies responsible for enforcing the regulations. The list is not exhaustive and additional regulations may apply. This discussion does not include a list of general local, State, and federal regulations, only those with specific mention of SDC or those that are clearly relevant given the known resources on the property.

Local Regulations

Sonoma County General Plan and Local Zoning

California planning law (Government Code Sections 65302–65303) requires each city and county within the State to develop and adopt a general plan. General plans are long-range policy documents to guide the use and future development of private and public lands within the boundaries of a city or county.

The Sonoma County General Plan (General Plan) is the blueprint for how land is used in unincorporated Sonoma County, and it sets forth the County's official position on issues, such as development and resource management (PRMD, 2008). The General Plan establishes policies for regulating new development projects within the unincorporated portions of the County. These policies are then translated into implementation tools (such as the zoning ordinance, subdivision regulations, and design guidelines) to assure that the County's vision is implemented. Policies set forth in the plan guide decisions about the conservation of resources within the county. The zoning ordinance is the primary tool used to implement General Plan policies. In contrast to the long-term outlook of the General Plan, zoning classifies the specific, immediate uses of land. SDC is located in General Plan Planning Area 9, Sonoma Valley.

The four Sonoma County Assessor's Parcel Numbers comprising SDC (APNs 054-090-001, 054-150-010, 054-150-005, and 054-150-013) are currently designated Public / Quasi-Public in the County General Plan. Table 5 shows the land use designation and zoning for each parcel.

Table 5. Parcel Land Use and Zoning Designations

APN	Land Use Designation	Base Zoning	Combining District
054-090-001	Public/Quasi-Public	PF/B7	F2 HD LG/MTN RC50 SR VOH
054-150-005	Public/Quasi-Public	PF/B7	F2 RC50 SR VOH
054-150-010	Public/Quasi-Public	PF/B7	RC50 SR VOH
054-150-013	Public/Quasi-Public	PF/B7	RC50 SR

The base zoning for each parcel is PF B7 which means that the parcels are zoned Public Facilities (PF) and restricted from further subdivision (B7). The combining districts vary by parcel: 100 year flood hazard area (F2), historic resources (HC), scenic resources (SR), local area development guidelines (LG/MTN), riparian corridor 50 feet (RC50), and/or Valley oak combining district (VOH). If uses other than public facilities were to be proposed for the property, a change in land use designation would likely be needed.

General Plan elements that may be relevant to the property are as follows:

The Land Use Element guides growth, development, and use of land through 2020. It specifically designates SDC as a public/quasi-public resource because it "serves the community or public needs and are owned and operated by governmental agencies, non-profit entities, or public utilities". According to Policy LU—20ff, the General Plan designates SDC as a "priority for future public uses if it is declared surplus and offered for sale to local agencies, particularly park, recreation, and open space uses and affordable housing".

The Open Space and Resource Conservation Element (OSRC Element) addresses open space for the preservation of natural resources, for the managed production of resources, for outdoor recreation, for public health and safety, and for archeological, historical, and cultural resources. The purpose of the OSRC Element is to preserve the natural and scenic resources in the County, and the Land Use Element is consistent policies included in the OSRC Element.

The SDC property is within a Scenic Landscape Unit (Figure OSRC-1). Numerous goals and policies pertain to the protection of the scenic character in these areas. Goal OCRC-2: Retain the largely open, scenic character of important Scenic Landscape Units, seeks to retain the rural, scenic character through limitation on development densities, protection of ridges and crests through limitations of ridgeline structures, and protection of hills and ridges from cuts and fills. The OSRC Elements also includes policies to limit amendments that increase residential densities and to avoid commercial or industrial uses in Scenic

Landscape Units.

Arnold Drive is identified as a Scenic Corridor in the General Plan. Goal OSRC-3 seeks to preserve roadside landscapes with high visual quality, and several objectives identify restrictions on future land uses and development including restrictive siting and setback policies to preserve visual quality and protect the rural character of the area.

SDC is in the Sonoma Valley Habitat Connectivity Corridor, one of two Habitat Connectivity Corridors mapped in the Open Space and Resource Conservation Element of the Sonoma County General Plan 2020. This Corridor provides a one-mile-wide connection across Sonoma Valley from Sonoma Mountain to the wildlands of the Mayacamas Mountains.

The SDC property supports vast biotic resources including riparian corridors, marshes and wetlands, sensitive natural communities, and habitat connectivity corridors, and the OSRC include goals and policies designed to protect these resources. Riparian corridors on the property fall within the biotic resources zone where setbacks apply to all future development to allow for the protection of riparian vegetation, water resources, and habitat values (SCGP Goal OSRC-8). Similarly, special-status species, marshes and wetlands, and sensitive natural communities are regulated to protect and enhance the County's natural habitats and diverse plant and animal communities (SCGP Goal OSRC-7). Of particular relevance is the preservation and protection of native trees and woodlands, including oak woodlands (SCGP Policies OSRC-7k and 7l) and control of invasive species, native plant regeneration, and control of Sudden Oak Death (SCGP Policy OSRC-7p). In addition to the protection of riparian corridors, wetlands, and wildlife, water resources are protected through water quality, ground water, and conservation and re-use, watershed management policies that will guide the future development of the SDC property (see SCGP Goals WR-1 to 6).

The SDC property includes numerous known historic resources as well as archaeological and cultural resources. The OSRC Element seeks to protect and preserve the County's heritage through implementation of goals and policies OSRC-19 which identifies the need to protect and preserve significant archaeological and historic sites in Sonoma County.

State and Federal Regulations

California Environmental Quality Act

The California Environmental Quality Act (CEQA) was passed in 1970 to institute a statewide policy of environmental protection. Projects undertaken, funded, or requiring a permit by a state or local public agency must comply with CEQA. The primary purposes of CEQA are to inform decision-makers and the public about the potential

environmental impacts of the proposed activities, identify ways that environmental damage can be avoided or significantly reduced, require changes in projects through the use of alternatives or mitigation measures when feasible, and disclose to the public the reasons why a project was approved if significant environmental effects are determined.

The sale of surplus property by the State of California is commonly exempt from the provisions of CEQA under Section 15312, Surplus Government Property Sales. The exemption applies except for parcels of land located in an area of statewide, regional, or area-wide importance. The State would need to determine whether or not the sale is exempt. Regardless of the CEQA requirements for the property sale, any future development of the property would likely require CEQA compliance and the documentation needs would vary depending on the proposed project.

California Department of Fish and Wildlife/California Department of Fish and Game Code

The California Department of Fish and Wildlife (CDFW) is responsible for managing, conserving, and protecting the state's biological resources including fish, wildlife, and plants. Under the California Fish and Game Code, CDFW must be notified when work is proposed in a creek, river, or lake in which there is at any time an existing fish or wildlife resource or from which such resources derive benefit. Projects affecting or potentially affecting such resources must obtain a Streambed Alteration Agreement from CDFW and comply with CEQA. Future development of the property will require consultation with CDFW and issuance of a permit if work is proposed in any aquatic resources or where native species would derive benefit.

Under sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) of the California Fish and Game Code, CDFW designates certain animal species as "fully protected." Fully protected species may not be taken or possessed at any time. Future development of the property will require avoidance of fully protected species.

Regional Water Quality Control Board

Under Section 13263 of the Porter-Cologne Water Quality Act, the Regional Water Quality Control Board (RWQCB) is authorized to regulate discharge and fill within waters of the State, wetlands, including isolated features. Through this process the local RWCQB issues a Waste Discharge Requirement (WDR). Future development of the property will require consultation with the RWQCB and issuance of a permit if work is proposed in any wetland or other waters of the state, including isolated wetlands. Issuance of a WDR requires CEQA

compliance.

State and Federal Endangered Species Act Compliance

Under the federal Endangered Species Act of 1973 (FESA), the Secretary of the Interior and the Secretary of Commerce have joint authority to list a species as threatened or endangered. Two federal agencies oversee the FESA: the U.S. Fish and Wildlife Service (USFWS), a part of the Department of the Interior, has jurisdiction over plants, wildlife, and resident fish, while NOAA's National Marine Fisheries Service (NOAA Fisheries Service), a part of the Commerce Department, has jurisdiction over anadromous fish and marine fish and mammals. Section 7 of the FESA mandates that all federal agencies consult with USFWS and NOAA Fisheries Service to ensure that federal agency actions do not jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat for listed species.

The FESA prohibits "take" of any fish or wildlife species listed as threatened or endangered, including the destruction of habitat that could hinder species recovery. Section 10 of the FESA requires the issuance of an incidental take permit before any public or private action may be taken that would potentially result in "take," which is defined as actions that would potentially harm, harass, injure, kill, capture, collect, or otherwise hurt any individual of an endangered or threatened species. Future development of the property will require consultation with USFWS and/or NOAA Fisheries issuance of a permit if proposed activities will result in take or habitat modification for listed species.

Under the California Endangered Species Act of 1984 (CESA), CDFW is responsible for maintaining a list of endangered and threatened species. The list also includes federally proposed and state candidate species, which are species that CDFW has formally noticed as being under review for addition to either the list of endangered species or the list of threatened species, as well as fully protected species. CDFW also maintains lists of California special concern species that serve as watch lists. Pursuant to the requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any state-listed as endangered or threatened species may be present in the project area and determine whether the proposed project will have a potentially significant impact on such species. In addition, CDFW encourages informal consultation on any proposed project that may affect candidate species.

Protected Bird Species

Nesting native bird species are protected under both federal and state regulations. Under the federal Migratory Bird Treaty Act (MBTA), it is unlawful to take, kill, and/or possess migratory birds at any time or in any manner, unless the appropriate permits are obtained. Protections

extend to active nests, eggs, and young birds still in the nest. Birds and their nests are also protected under the California Fish and Game Code. Most bird species, with a few specific exceptions, are protected under the MBTA and California Fish and Game Code. Heron and egret rookeries are also protected under the above-mentioned regulations, and, while not formally listed, CDFW considers rookeries to be a sensitive resource. Future development of the property must consider the protection of bird species; specific avoidance measures will be addressed during CEQA and consultation with CDFW.

California Register of Historical Resources

The California Register is "an authoritative listing and guide to be used by state and local agencies, private groups and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Section 5024.1[a]). The criteria for eligibility to the California Register are based on National Register criteria (PRC Section 5024.1[b]). Certain resources are determined by the statute to be automatically included in the California Register, including California properties formally determined eligible for or listed in the National Register.

To be eligible for the California Register as a historical resource, a prehistoric or historic-period resource must be significant at the local or State level under one or more of the following criteria:

- Is associated with events that have made a significant contribution to the broad patterns of
- California's history and cultural heritage;
- Is associated with the lives of persons important in our past;
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Has yielded, or may be likely to yield, information important in prehistory or history (CEQA Guidelines Section 15064.5 [a][3]).

For a resource to be eligible for the California Register, it must also retain enough integrity to be recognizable as a historical resource and to convey its significance. The seven aspects of integrity are: location, design, setting, materials, workmanship, feeling and association. A resource that does not retain sufficient integrity to meet the National Register criteria may still be eligible for listing in the California Register. A resource that has lost its historic character or appearance may still have sufficient integrity for the California Register if it maintains the potential to yield significant scientific or historical information or specific data. The Main Building (the brick building at the west end of the main drive) was made a National Historical Landmark in August

2000. SDC may be nominated as a historic district, and many buildings on the property may be contributors to the district or may be historic resources themselves.

California Public Resources Code

Several sections of the PRC protect cultural resources and PRC Section 5097.5 protects vertebrate paleontological sites located on public land. Under Section 5097.5, no person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface, any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site (including fossilized footprints), inscriptions made by human agency, rock art, or any other archaeological, paleontological, or historical feature situated on public lands, except with the express permission of the public agency that has jurisdiction over the lands. Violation of this section is a misdemeanor.

PRC Section 5097.98 states that if Native American human remains are identified within a project area, the landowner must work with the Native American Most Likely Descendant as identified by the NAHC to develop a plan for the treatment or disposition of the human remains and any items associated with Native American burials with appropriate dignity. California Health and Safety Code Section 7050.5 prohibits disinterring, disturbing, or removing human remains from a location other than a dedicated cemetery. Section 30244 of the PRC requires reasonable mitigation for impacts on paleontological and archaeological resources that occur as a result of development on public lands.

Jurisdictional Wetlands and Waters

Jurisdictional wetlands and other waters of the U.S., including stream channels, are regulated by the U.S. Army Corps of Engineers (Corps) under the provisions of Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. Any disposal of dredged or fill material and structures, as well as work in wetlands or waters, require a permit from the Corps. Future development of the property will require consultation with the Corps and issuance of a permit if work is proposed in any wetland or other waters of the U.S.

Under Section 401 of the federal Clean Water Act, the Corps is required to meet state water quality regulations prior to granting a Section 404 permit. This is accomplished by application to the local RWQCB for Section 401 certification that requirements have been met. Future development of the property will require consultation with the RWQCB and issuance of a permit if work is proposed in any wetland or other waters of the U.S. A Section 401 Water Quality Certification will require CEQA compliance.

10 Data Gaps



Oak trees on the perimeter of the campus. Photo by Scott Hess, SLT.

To understand the resources on the SDC property with more specificity, additional studies could be conducted, including:

- Focused cultural resource surveys
- Focused Phase 1/hazardous materials assessment
- Field surveys to more comprehensively map and describe vegetation communities and habitats including focused surveys for sensitive species and an assessment of wetland habitat at northwest corner of the property
- Field surveys to more comprehensively describe wildlife communities and habitats including focused surveys for sensitive species.
- Current assessment of instream habitat conditions for Sonoma Creek and tributaries.

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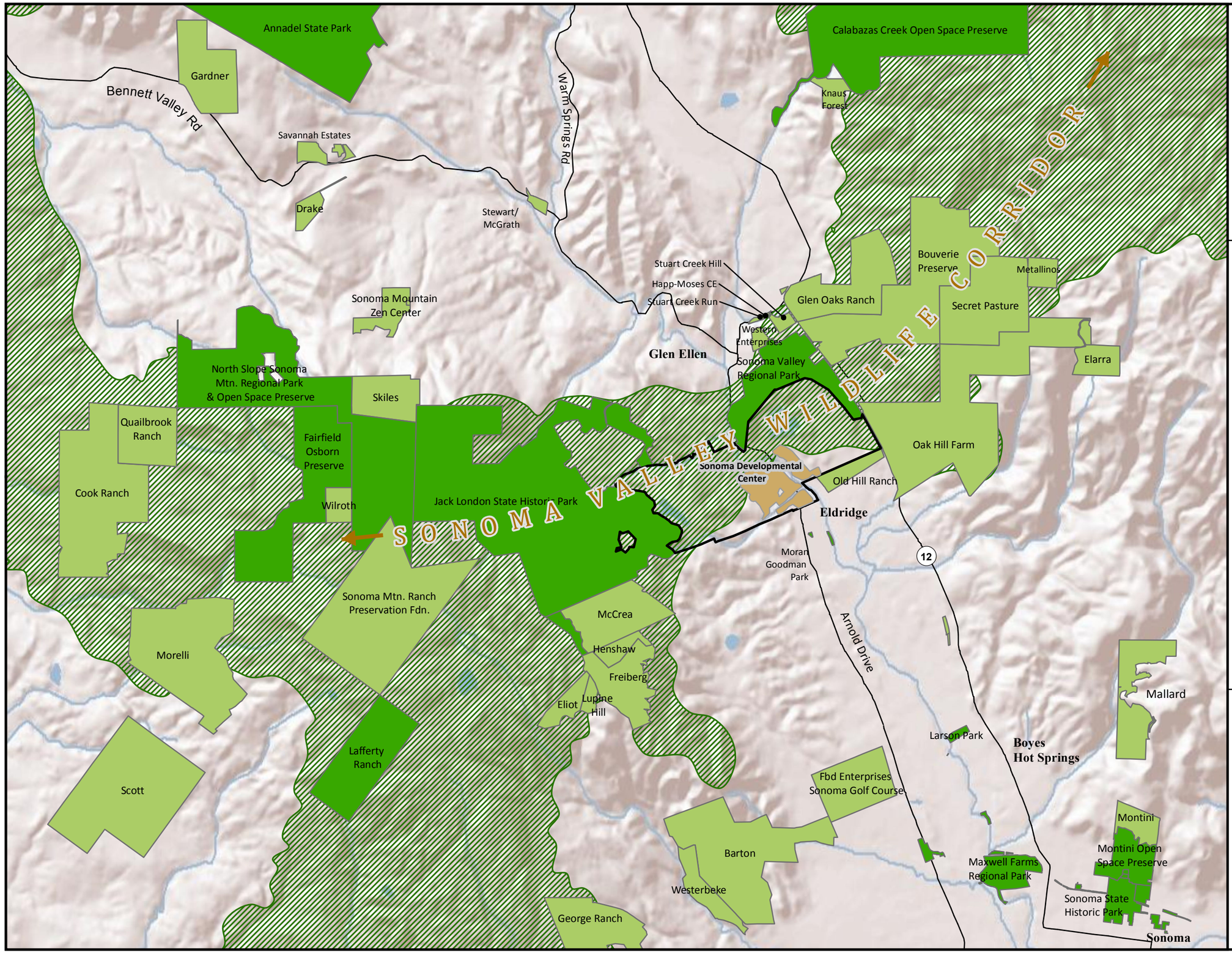
Exhibits

Exhibit 1. Regional Context
Exhibit 2. Topography
Exhibit 3. Soils
Exhibit 4. Watersheds and Hydrology
Exhibit 5. Vegetation
Exhibit 6. Special-Status Species Occurrences and Critical Wildlife Linkages in the Region
Exhibit 7. Facilities
Exhibit 8. Roads and Trails

Sonoma Developmental Center Resource Assessment

Exhibit 1

Regional Context



Legend

- Sonoma Developmental Center (Publicly Owned)
- SDC Core Campus
- Privately-Owned Protected Land
- Publicly-Owned Protected Land
- Critical Wildlife Linkage, Marin Coast - Blue Ridge

N

0 0.375 0.75 1.5

Miles

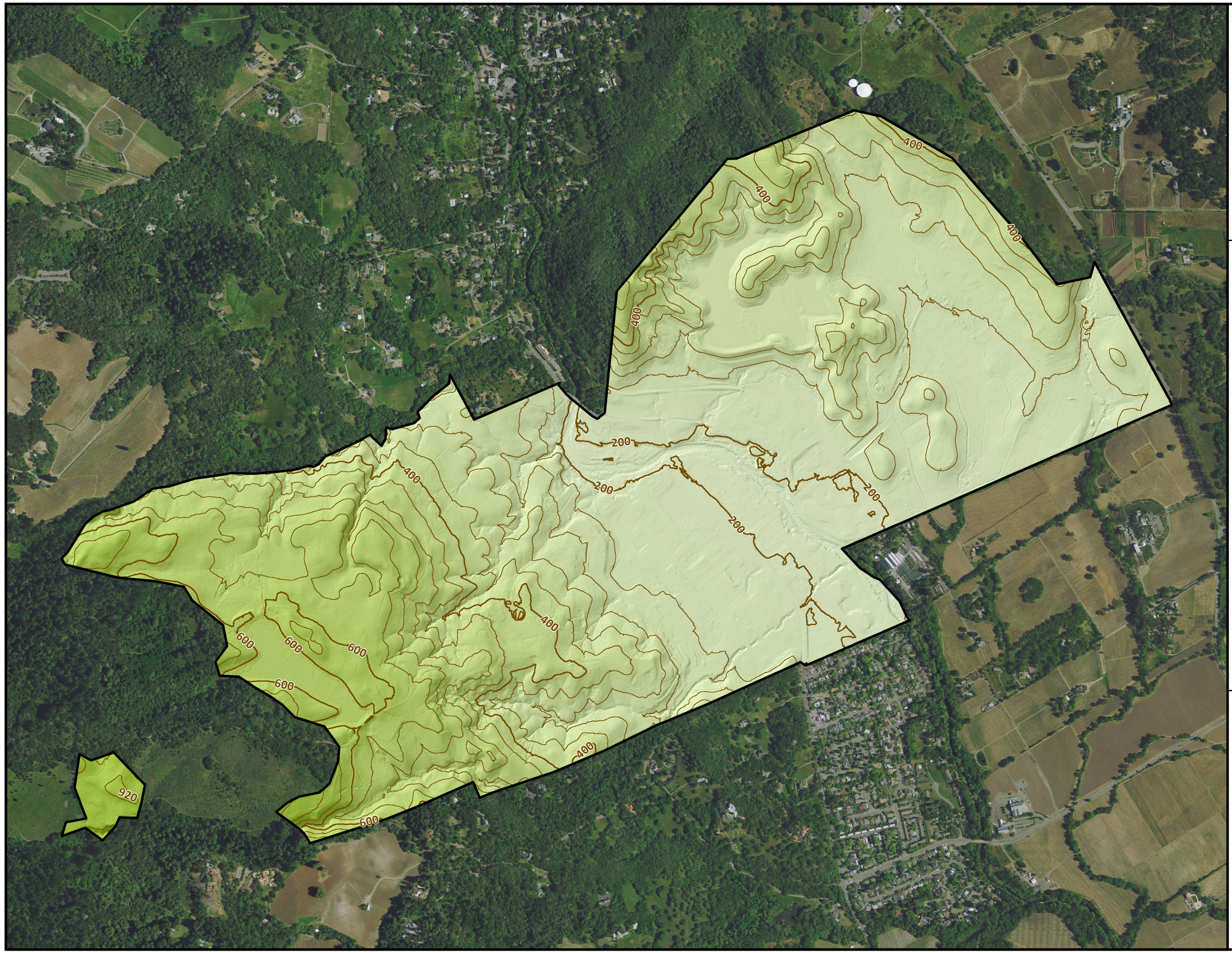
Sources
Protected Lands: Sonoma County Public and Protected Areas Database
Basemap: ESRI

Map created January 27, 2015, rev. 3/5/15

Sonoma Developmental Center
Resource Assessment

Exhibit 2

Topography



Legend

- SDC Boundary
- 40' Contours

N

0 500 1,000 2,000

Feet

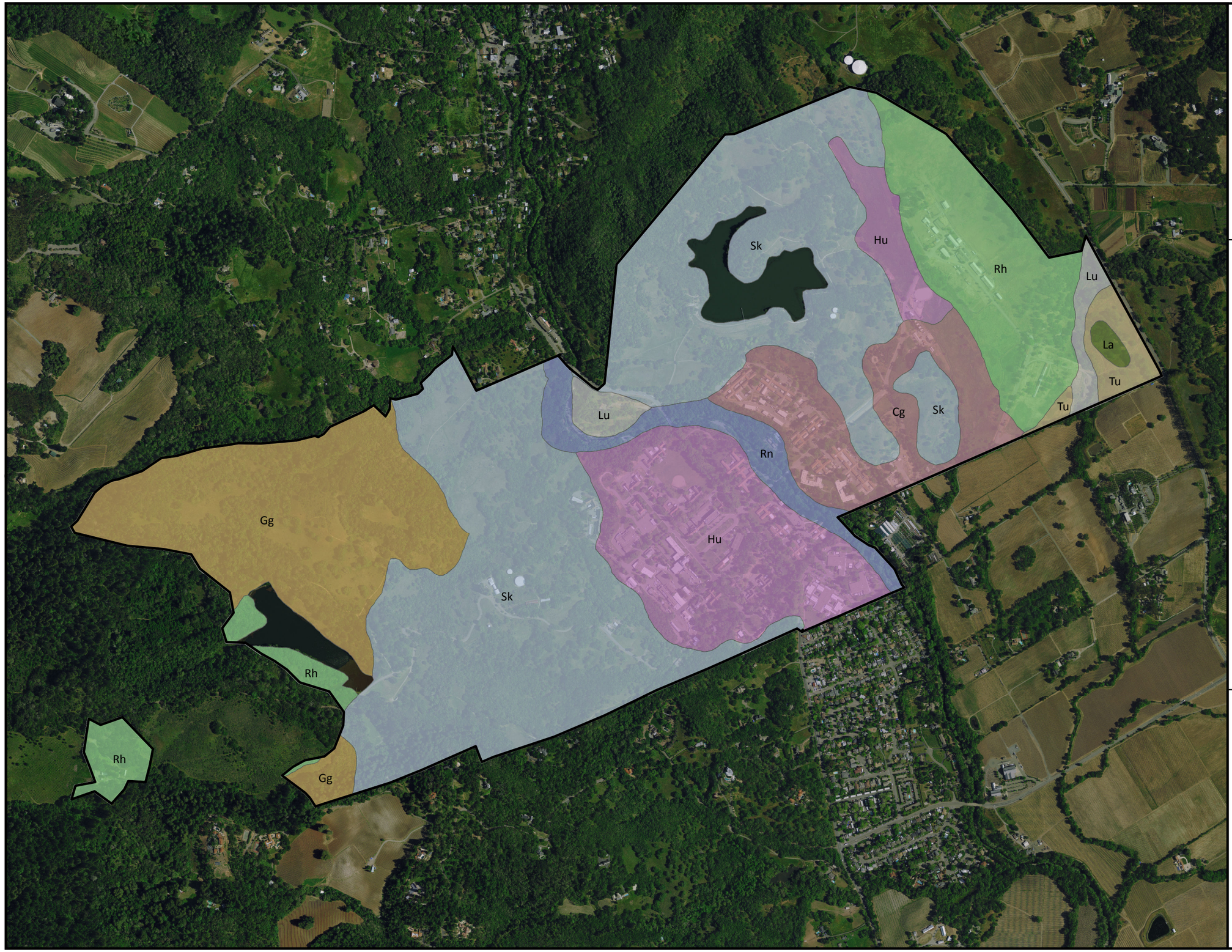
Sources
Topography: Sonoma County LiDAR 2013
Aerial imagery: Sonoma County 2011

Created January 27, 2015

Sonoma Developmental Center
Resource Assessment

Exhibit 3

Soils



Legend

- SDC Boundary

Soil Type

- Cg — Clough gravelly loam
- Gg — Goulding clay loam
- Hu — Huichica loam
- La — Laniger loam
- Lu — Los Robles gravelly clay loam
- Rh — Red Hill clay loam
- Rn — Riverwash
- Sk — Spreckels loam
- Tu — Tuscan cobbly clay loam

N

0 500 1,000 2,000

Feet

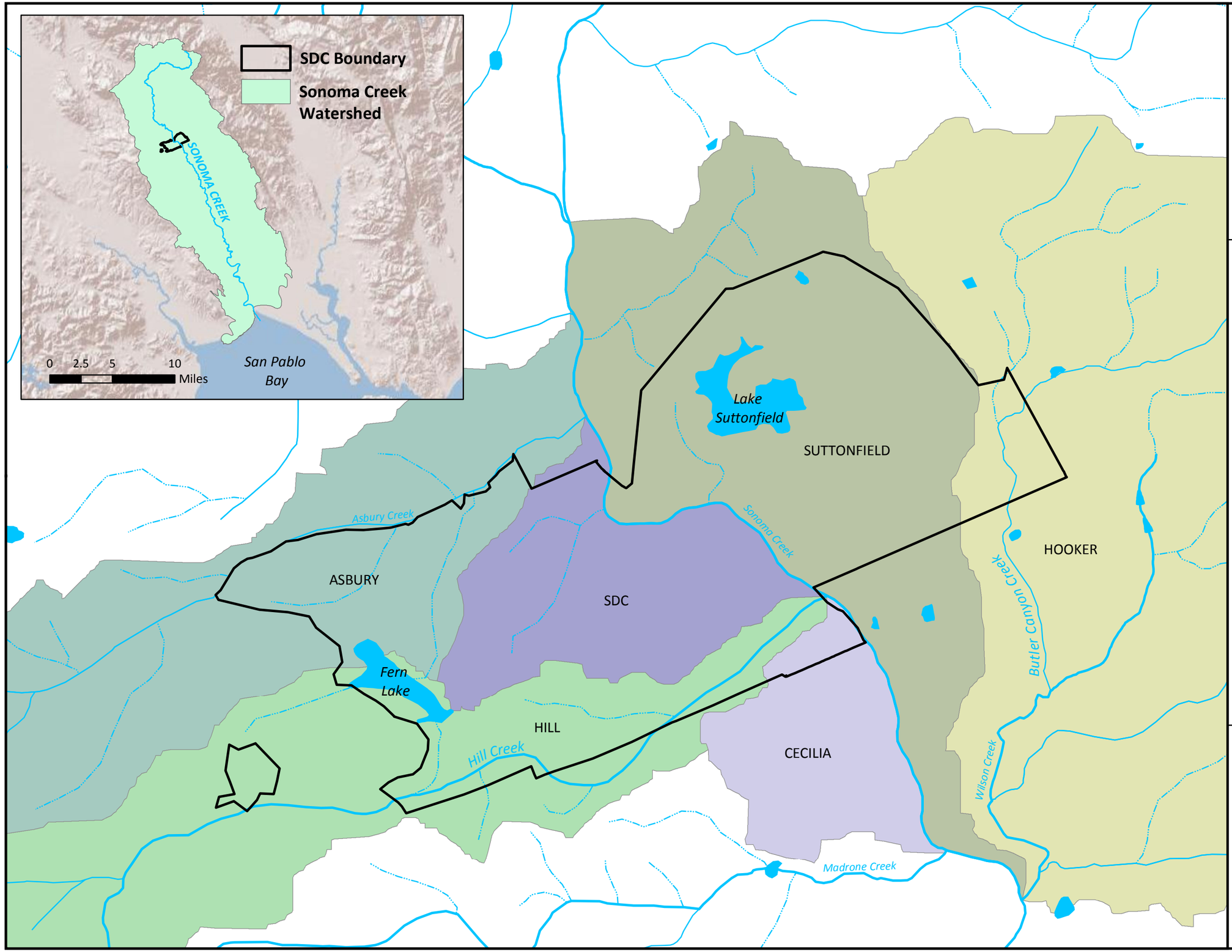
Sources
Soils: NRCS SSURGO
Aerial imagery: Sonoma County 2011

Created January 27, 2015

Sonoma Developmental Center Resource Assessment

Exhibit 4

Watersheds and Hydrology



Legend

- SDC Boundary
- Pond or reservoir
- Perennial stream or river
- Intermittent stream
- Ephemeral stream

Sub-Watersheds of Sonoma Creek at SDC

- ASBURY
- CECILIA
- HOOKER
- MILL
- SDC
- SUTTONFIELD

N

0 500 1,000 2,000
Feet

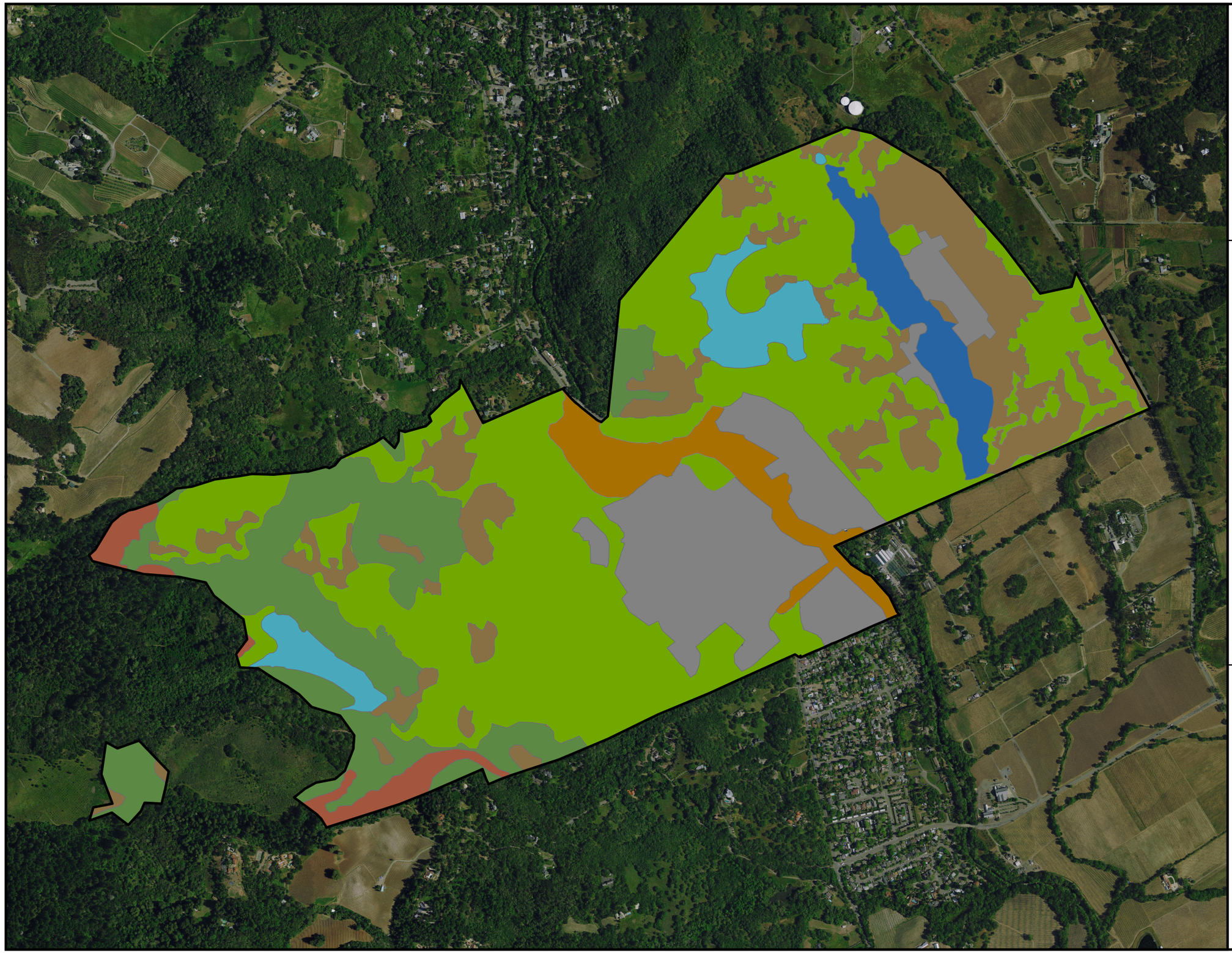
Sources
Streams: USGS, BAARI
Watersheds: USGS, BAARI

Created January 27, 2015, rev. 2/27/15

Sonoma Developmental Center
Resource Assessment

Exhibit 5

Vegetation



Legend

- SDC Boundary
- Reservoir or Pond
- Developed

Vegetation Type

- Mixed Evergreen Forest
- Redwood Forest
- Oak Woodland
- Riparian Woodland
- Grassland
- Wetland

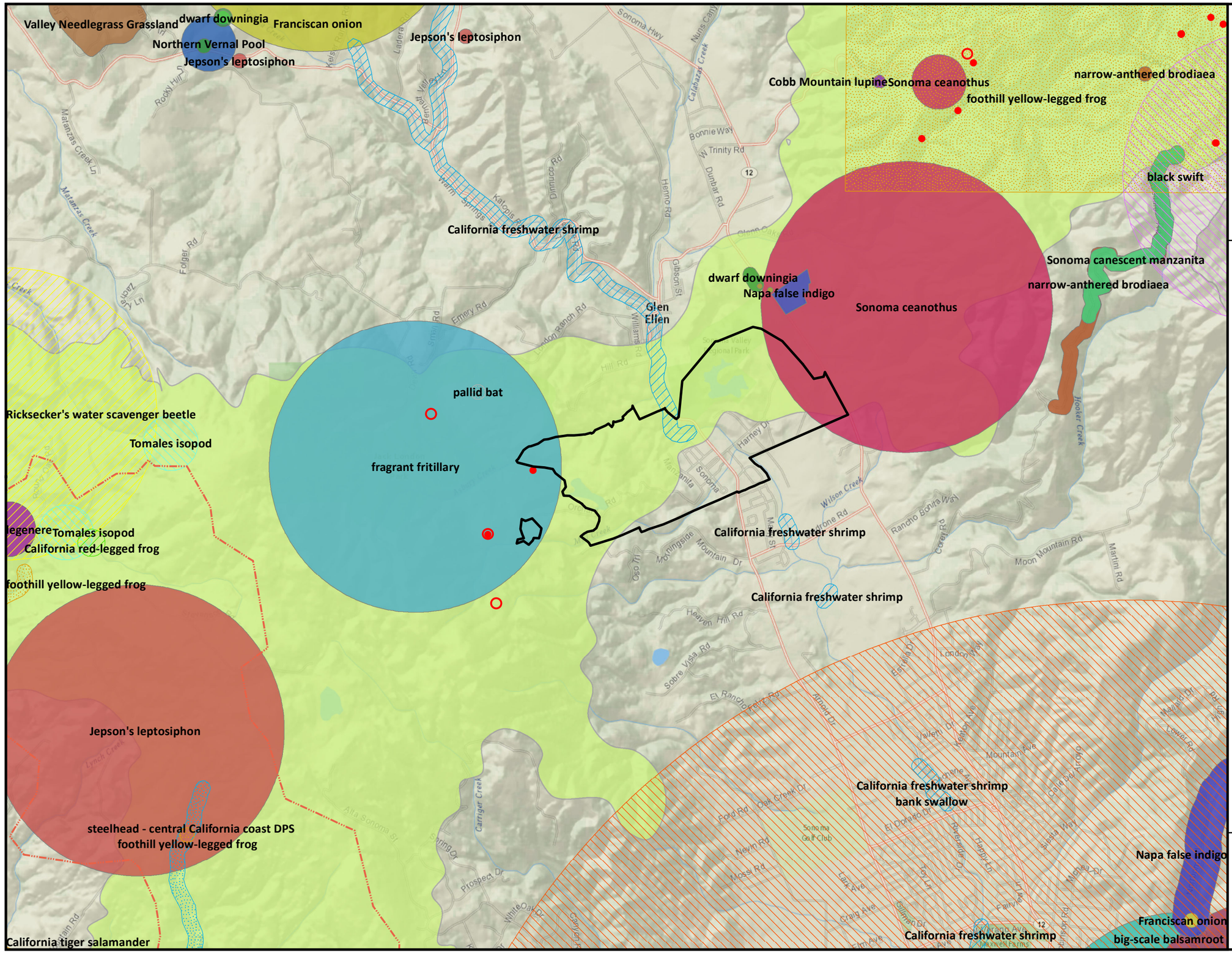
N

0 500 1,000 2,000

Feet

Sources
Aerial imagery: Sonoma County 2011
Vegetation: CalVeg, LSA 2001

Created January 27, 2015



Sonoma Developmental Center Resource Assessment

Exhibit 6

Special-Status Species Occurrences and Critical Wildlife Linkages in the Region

Legend

- SDC Boundary
- Critical Wildlife Linkage, Marin Coast-Blue Ridge

Animals

- bank swallow
- black swift
- California freshwater shrimp
- California red-legged frog
- California tiger salamander
- foothill yellow-legged frog
- pallid bat
- Ricksecker's water scavenger beetle
- steelhead - central California coast DPS
- Tomales isopod
- northern spotted owl observation
- northern spotted owl activity center
- CA red-legged frog Critical Habitat

Plants

- Baker's navarretia
- big-scale balsamroot
- Cobb Mountain lupine
- dwarf downingia
- fragrant fritillary
- Franciscan onion
- Jepson's leptosiphon
- legenere
- Napa false indigo
- narrow-anthered brodiaea
- oval-leaved viburnum
- Sonoma canescent manzanita
- Sonoma ceanothus
- Sonoma sunshine

Habitats

- Northern Vernal Pool
- Valley Needlegrass Grassland

0 0.375 0.75 1.5

Miles

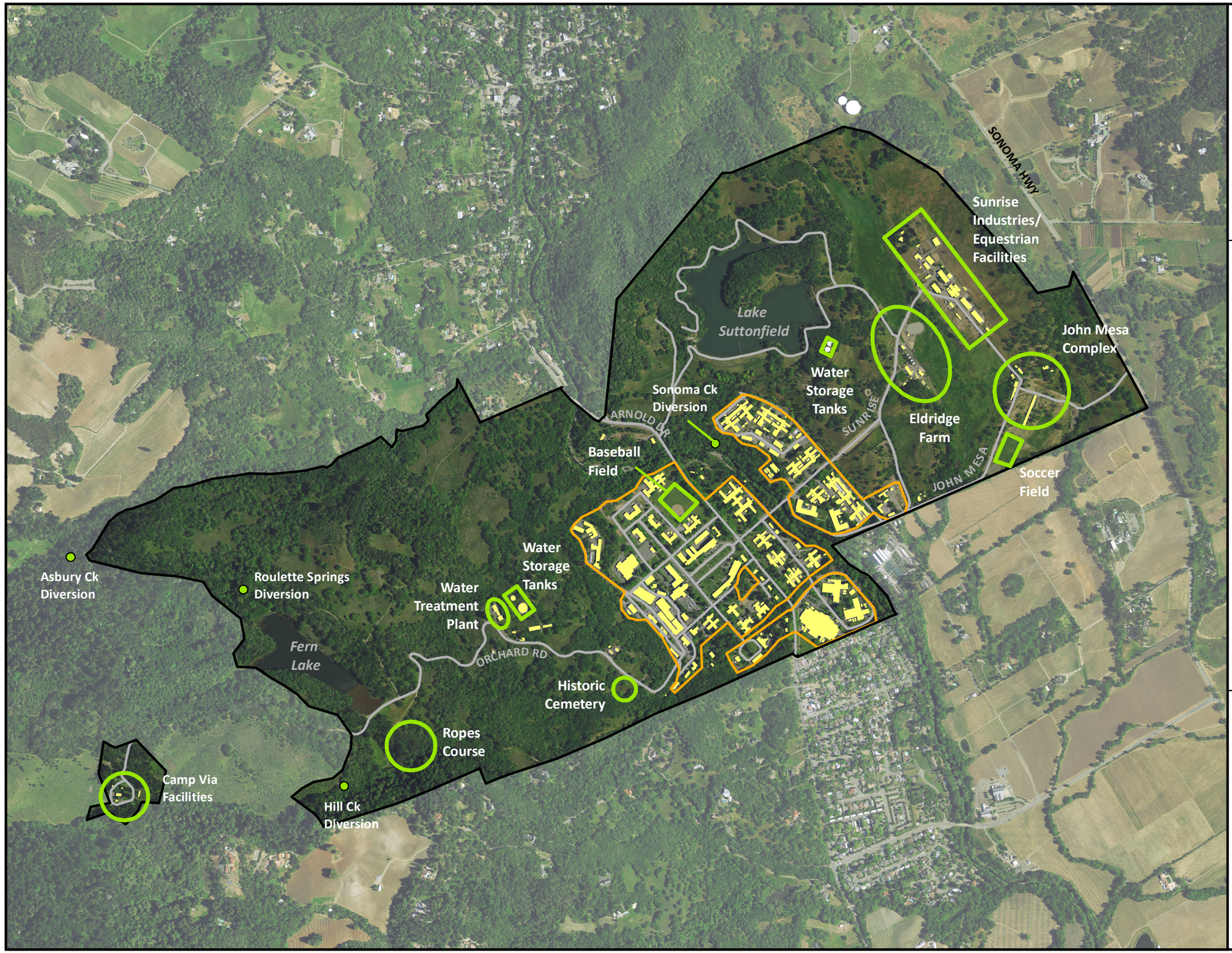
Sources
Species Occurrences: CNDDB; Critical Linkages: Conservation Lands Network; CA RLF Critical Habitat USFWS; Base map: ESRI
Created January 27, 2015, rev. 2/27/15

N

Sonoma Developmental Center
Resource Assessment

Exhibit 7

Facilities



Legend

- SDC Boundary
- Core Campus
- Facilities
- Roads
- Buildings
- Water Diversions

Water Diversion locations based on coordinates provided by the California State Water Resources Control Board's Electronic Water Rights Information Management System.

N

0 500 1,000 2,000

Feet

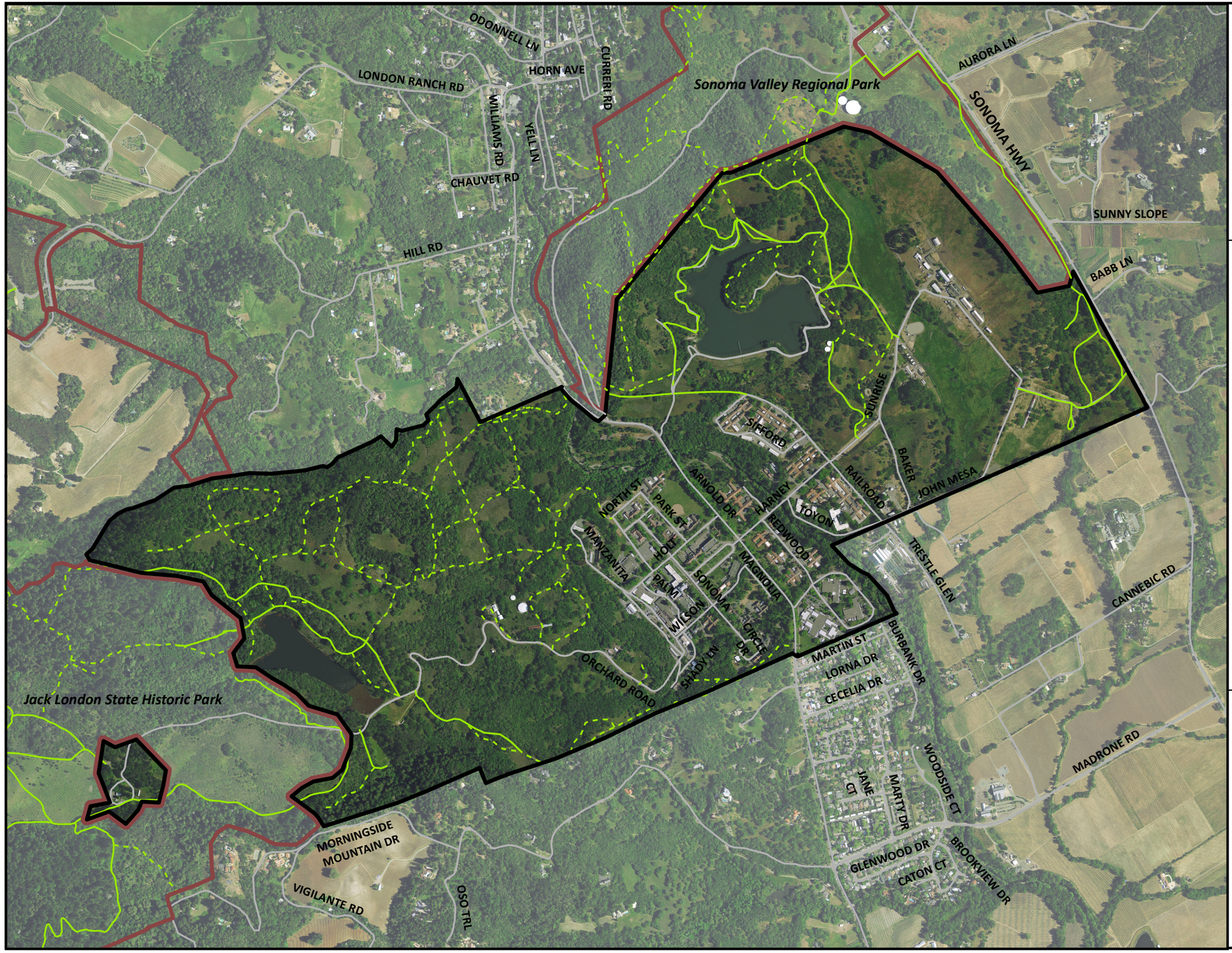
Sources
Building Footprints: Sonoma County LiDAR 2013
Roads and Trails: Sonoma Ecology Center
Aerial Imagery: Sonoma County 2011
Water Diversions: CA State Water Resources Control Board

Created January 27, 2015, rev. 4/8/15

Sonoma Developmental Center Resource Assessment

Exhibit 8

Roads and Trails



Legend

- SDC Boundary
- Boundary - Jack London State Historic Park and Sonoma Valley Regional Park
- Paved road
- Unpaved access road
- Trail

N

0 500 1,000 2,000

Feet

Sources
Roads and Trails: Sonoma Ecology Center, SC Reg. Parks
Aerial imagery: Sonoma County 2011

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