

An aerial photograph of a mountainous region. The foreground shows a dense forest of green trees. In the middle ground, a valley is visible, surrounded by rolling hills and mountains. The background features more distant, hazy mountain ranges under a clear sky. The overall scene is a natural, forested landscape.

**Stebbins Cold Canyon Reserve:
Master Trail Plan**

By Tara Sióbhán Hanlon

Stebbins Cold Canyon Reserve: Master Trail Plan

A Senior Undergraduate Thesis Project
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Undergraduate Requirement for a
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Abstract

The Stebbins Cold Canyon Reserve (SCCR) has substantially more visitors annually than most reserves in the University of California's Natural Reserve System (NRS). An opportunity exists to accommodate the many users of the SCCR by creating safer trails and access points, increasing the variety of hiking trails that can be used, providing more educational features, and decreasing the amount of erosion on trails and parking areas. This project attempts to address these issues through design to create an even better trail and day-use wilderness area for visitors to enjoy and reserve managers to handle.

Specific methods and procedures were used to determine the master trail plan. I researched trail design standards, greenway guidelines, the Putah Creek watershed, American Indians of the area and read about the natural history, flora and fauna of SCCR. I conducted a survey to acquire information about SCCR users. It was distributed to the SCCR listserv and the Putah Creek Reserve Committee listserv. I made three hiking trips around the current loop trail prior to starting work on this project. After beginning

this project, I visited the reserve three times: once to hike through a portion of the wilderness area along Wild Horse Creek on California Department of Fish and Game land, to volunteer with trail clearing on a newly opened portion of trail that leads into the area around the Cold Creek headwaters, and to explore the area around the parking lots, highway crossing to the trailhead, culverts under the highway, and a portion of the steeply sloping trail that heads up the ridgeline eastward from the main reserve trailhead.

Further research is necessary to truly comprehend the issues and organizational workings of a project like this. Multi-agency planning projects take a long time to fully implement. It takes dedication from many individuals to get master plans to come to a completion. This project can hopefully provide the University of California Natural Reserve System and the Tuleyome Organization, who are both intertwined with the reserve, a helpful tool to continue their work on the management and expansion of trails in the Stebbins Cold Canyon Reserve.

Dedication

To my companion.
My chauffeur.
My comfort and support.
My Jonny.

Thank you.

Acknowledgements

My committee members, thank you for sharing your time to guide me through this project, enthusiasm about the Stebbins Cold Canyon Reserve, and your wealth of knowledge. Mark, thank you for your work making the Landscape Architecture Program what it is today. I wouldn't have chosen this program without the hard work of people like you. Happy Retirement! Andrew, thank you for exposing me to this awesome project, sharing your intimate knowledge about SCCR, and being so prompt with correspondence. Steve, thank you for your trouble-shooting assistance with GIS and your ecologically sensitive design suggestions. Shane, thank you for sharing research materials, GIS data, access to the listservs for the survey, and knowledge about SCCR. Patsy, thank you for the help with my survey, and continued guidance to approaching the task of completing my senior project, especially through the sticky parts.

My classmates, thank you for the critiques, creative design solutions, late-night support, ranting sessions, and fun times. I will forever have fond memories of you from this phase of my life. Alison, special thanks for your GIS help. Go, Geographers!

My family, you mean so much to me. I love you and could never have become the person I am today without your continuous love and support. Mom, Dad, Erin, Megan, and Katie, thank you.

Jonny, I'm not sure I will ever have the patience you have shown me over the years. I truly appreciate all the thoughtful and supportive things you continue to do, and for putting up with my crazy schedule. I love you. Thank you for being my man.

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Preface

The intent of this document is to be a guideline or starting point for further design. Additional research and discussion is recommended before any final design proposals are implemented. This master plan is conceptual. Trail placement and the trailhead design are conceptual. Qualified professionals should be consulted if any landscape design suggestions are to be considered for this site.

This project was inspired by Andrew Fulks, who spoke at the LDA 190 Lunchbag Lecture Series this past winter. His lecture topic was a presentation of the many existing and proposed trails, public lands, and open space that are (or could be) in the Northern Inner Coastal Mountain Range. It was stimulating to hear about all the projects that are in the works, and to hear about all the trails and open spaces that are so close to Davis. As an outdoor enthusiast, I was really motivated to choose a senior project topic about which I would be passionate. I made an appointment to meet with Andrew after his presentation to see if he could recommend a project that would be suitable as a senior project thesis. To my delight, he suggested using the trail expansion of the Stebbins Cold Canyon Reserve as my project topic... And so it was.

The Stebbins Cold Canyon Reserve (SCCR) is part of the John Muir Institute of the Environment within the University of California's Natural Reserve System (NRS). The mission of the NRS is to contribute to the understanding and wise management of the earth and its natural systems by supporting university-level teaching, research, and public service at protected natural areas throughout California. The SCCR is one of 37 reserves that the NRS manages, improving infrastructure (trail erosion, sign placement, and recreational management) since 1980 (Weathers 15). They have been managing the reserve since they purchased the first parcel in 1979 (Shannon, 12).

Along with the NRS, another regionally local organization has been working to protect natural landscapes of California. Tuleyome, a non-profit public-benefit corporation, has a vision for the region: to protect, preserve, restore and enjoy our natural resources (BSM Newsletter, 2). With the generous contributions of many donors, Tuleyome was able to purchase 72-acres to protect the area around the Cold Creek headwaters, which is adjacent to the southern border of the SCCR (see SCCR Parcel Map on page 9). Trail clearing on the new parcel was started April 18, 2010 along a firebreak



Photo 1: The new trail signage

The focus of my project was to improve and increase the trails around the SCCR. The original intentions of the reserve as designated space for research and classroom instruction have changed over the years. Recreational users of the reserve have created unsanctioned trails in and around the reserve, which has increased erosion of the

that was created from the California Department of Fire in 1988 when a fire was intentionally set to decrease the amount of fuels in this area (Shannon, 12). This trail, which connects with the loop trail along the Blue Ridge, joins the existing trail near the top of the stairs from the old homestead. Currently it is open to the public and a sign was recently erected, with the name “Tuleyome Trail” to direct hikers (see Photo 1).

The focus of my

official trails (Shannon, 12). Unplanned trail systems often cause greater environmental impacts than carefully planned routes (IMBA, 31). The trail that heads up the ridgeline to the east of the SCCR is one example of these unsanctioned trails. It travels along a steep slope, which causes water to gully along the trail instead of sheet flow (see Photo 2). Following sustainable trail design increases the life of trails. Expanding trail options that connect with existing trails will offer a greater variety of accessible points to users. The looping Blue Ridge and Homestead Trails are about 5 miles in length. Longer trail routes and connections to proposed regional trails would offer greater accessibility to open space networks.

Before discussing the specific findings of my research, it is important to clarify the area under discussion. To make it easier to understand, I will use the commonly



Photo 2: Eroded unsanctioned trail

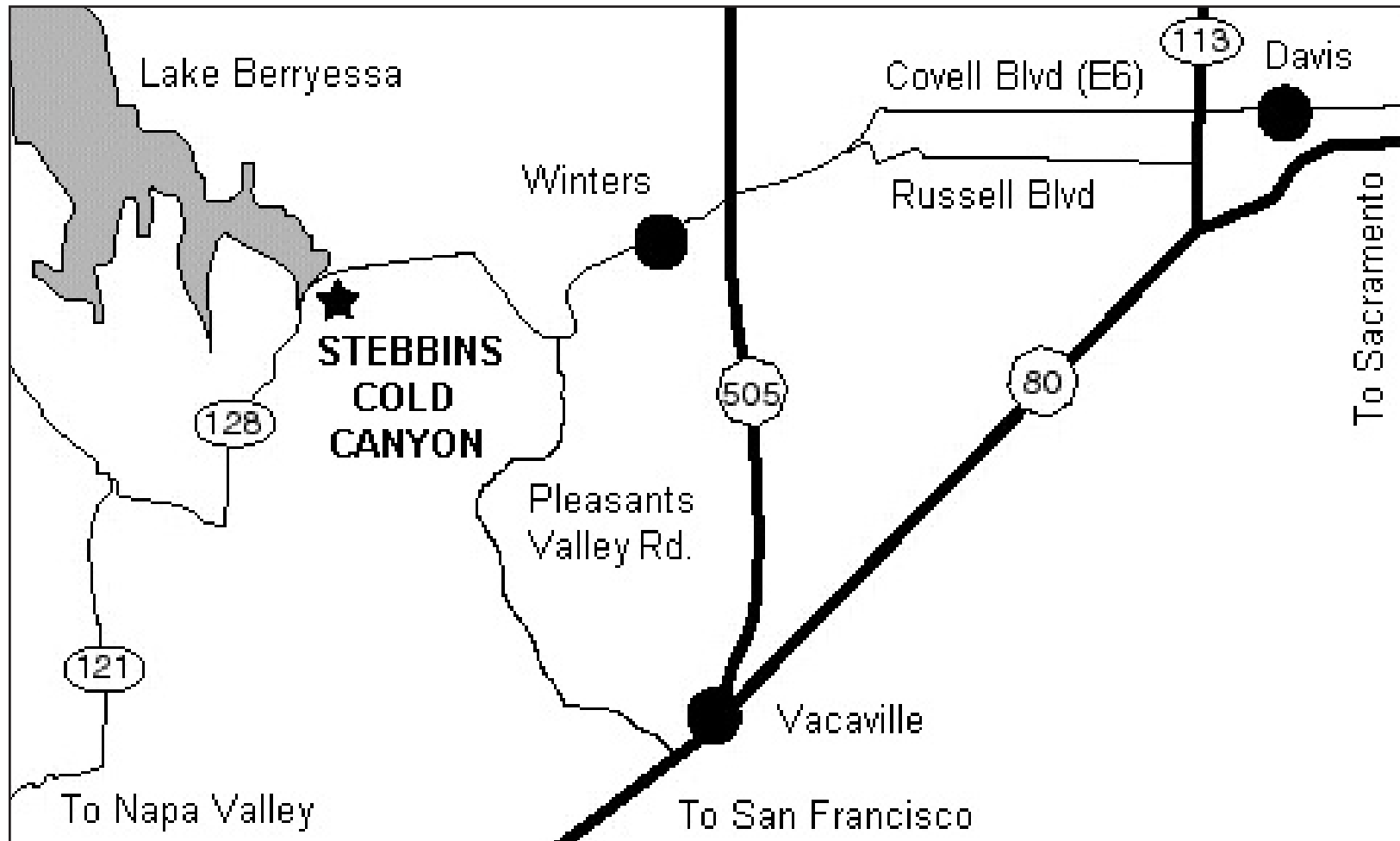
used names throughout this project, not the geographically correct names. There are some inaccuracies with feature names in the vicinity of this project. Some of the feature names are not valid, but have been used for such a long time that they are what most people use. My intention is not to re-name these features, but to point out some of the inaccuracies. Two features worth bringing to light, especially if the Inner Coastal Range trail systems successfully connect, are the extent of Cold Creek versus Wild Horse Creek and Pleasants Ridge, with the steeply sloping ridgeline trail bordering the eastern side of the SCCR property.

Cold Creek is not the water body that flows into Putah Creek and Pleasants Ridge is actually an unnamed ridge of the Vaca Mountains (see context map on page x). Watersheds are named for the largest body of water running through them. Cold Creek is a smaller creek that flows into the Wild Horse Creek at the intersection about 1,000 feet north of what remains of the Vlahos' cold storage foundation. The Wild Horse Creek starts at a higher elevation, has a longer length of stream, carries more water seasonally than the Cold Creek, and is the water body that flows into Putah Creek. The Stebbins Cold Canyon Reserve has more water from the Wild Horse Creek flowing through it than the Cold Creek. The so-

called Pleasants Ridge with the steeply sloping trail would be more accurately called the Eastern Ridge of the lower Wild Horse Creek. The real Pleasants Ridge is actually the adjacent ridgeline to the east of what is referred to as Pleasants Ridge. The true Pleasants Ridge was named for the farming family who lived in the Pleasants Valley, which is closer to the town of Winters.

In an effort to more fully understand patterns of usage and visitor characteristics, I sought information from people who were familiar with or had shown interest in the SCCR. Current reserve user information was not available, so I conducted a user survey to find the information I was looking for. Shane Waddell, Projects Manager for the SCCR, provided access to the Stebbins Cold Canyon Reserve listserv and the Putah Creek Committee listserv. These groups served as the pool of respondents for the user survey. There was great response to the survey with 203 participants in total. Appendix A has a reproduction of the online survey, charts, and a more complete listing of the responses gathered. The complete responses to open-ended questions are omitted from Appendix A in attempts to maintain brevity of this document.

Context Map





Introduction



History of Cold Canyon

For thousands of years, the Southwestern Wintun, or Hill Patwin, occupied the middle elevations around Putah Creek (BSM Management Proposal, 37). The Hill Patwin around Putah, Wild Horse, and Cold Creek lived in semi-permanent villages (SCCR Newsletter, Fall 2007, 1) in semi-subterranean houses with excavated floors, mounded earth walls and earthen or bark-covered roofs (BSM Management Proposal, 37). They were a hunter/gatherer society, relying on acorns, buckeye, and other native seeds, fruits and roots, as well as hunting a broad array of local fish and game (SCCR Newsletter, Spring 2007, pp.1). The archaeological discoveries in the vicinity of Cold Canyon suggest prolonged use of the reserve land as a hunting and foraging ground for at least two, if not three, Southern Patwin tribes (Weathers, 8). At least one mortar exists in the bedrock along Cold Creek near the creek crossing (Shannon, 7) in SCCR, and another was located in a rock along the creek during my project site

exploration (see Photo 1.1), which would have been used to grind food such as acorns, a staple of their diet.

With the nineteenth century Spanish explorations, Mexican land acquisitions, and American settlements, the ancient native cultures of the southern Sacramento Valley dwindled to extinction (Weathers, 8). When Spanish explorers and Russian fur traders came to California, new diseases such as smallpox and malaria were fatal to many Native Americans. An epidemic in 1833 emptied the

village of Putah-toi (EDAW/AECOM, 21), which was located downstream of Putah Creek from the Cold Canyon on land that is now UC Davis campus. The Spaniards forced many of the remaining Patwin onto the Solano Mission, where disease and deprivation took a heavy toll (EDAW/AECOM, 21). Whether due to relocation or smallpox epidemics, by 1877 no traces of the Southern Patwin remained (Weathers, 12).



Photo 1.1: Mortar & California newt

Ownership and land definition of California and the area around SCCR changed a few times over the following decades. After Mexican independence from Spain, the settlement of Rancho Los Potos in the Berryessa Valley was granted to Jose de Jesus Berryessa and his brother Sixto in 1841 (Weathers, 12). The republic of California was established with the end of the Mexican American War in 1848, the United States government admitted California as a State in 1850, and in 1852 Cold Canyon was legally defined as unappropriated unreserved public land in the Vacaville Township of Solano County (Weathers, 12-13). The Mexican and American settlers of the region were primarily interested in developing an agricultural base, but prospectors and

settlers came during the gold rush, and then on August 29, 1938 John Vlahos obtained a patent for the lands directly adjacent to and including the Stebbins Cold Canyon Reserve (Weathers, 13-14) for goat and cattle grazing (Shannon, 10). In 1968, John Vlahos sold part of his land (Parcel, 1) to Mr. and Mrs. Paul Leiter, and then the University of California's Natural Land and Water Reserve System purchased Parcel 1 in 1979 (Weathers, 14). The remainder of the reserve (Parcel, 2) was purchased from Petro and Virginia Vlahos in 1984 (Weathers, 14). Parcel 1 and 2 make up the rectangular shaped portion of the reserve. The UC NRS expanded the reserve property in August 2008 when they purchased the parcel south of Monticello Dam.

Berryessa Reservoir

Nestled in the center of Berryessa Valley was the town of Monticello (see Map 1.1), with a population of 250 and surrounded by 12,000 acres of farmland (Shannon, 10). Before Monticello Dam, Berryessa Valley was a fertile valley that was used for dry-farming and ranching (see Photo 1.2). Berryessa Valley was farmed without the aid of irrigation, just like most farming was being done in the

neighboring counties (Shannon, 10). In the early 1900s, dry-farming became uncompetitive as major irrigation projects throughout the Central Valley emerged (Shannon, 10). Solano County's development was being hampered by a lack of readily available water, so in the 1940s and 1950s the Solano Project came into being (EDAW/AECOM, 26).



Map I.1: 1915 California Capay Quadrangle

"It is the solemn duty of our generation to plan wisely for the best use of all purposes of every drop of water."

Earl Warren, Governor of California, 1948.

(EDAW/AECOM, 25)



Photo I.2: 1957, last cattle roundup, Monticello Rodeo Grounds

Lake Berryessa was formed when the BOR built Monticello Dam on Putah Creek in 1957 (BSM Management Proposal, 42). Monticello Dam was one piece of the BOR's Solano Project. The purpose for Monticello Dam was to (1) store water in Berryessa Reservoir for agricultural, urban, industrial, and military uses, (2) reduce flooding of lands along lower Putah Creek, and (3) provide

recreational benefits (Shannon, 11). Other effects of Monticello Dam were not entirely positive; the town of Monticello was submerged at the bottom of Lake Berryessa, the Putah Creek watershed was divided in two, habitat connections were severed for fish and large mammals, and low releases from the dam caused fish kill and withered riparian vegetation in 1989 (Shannon, 12).

The Stebbins Cold Canyon Reserve

The current trail system of the SCCR is contained in the two reserve parcels and crosses over CA DFG and BLM land. The two SCCR parcels span 258 hectares (638 acres) (SCCR Website) in the Vaca Mountains, the eastern-most ridge of the North Coast Ranges. The larger reserve parcel extends through the Cold Canyon from the area south of the hairpin turn of State Highway 128 and stretches south to the cold storage foundation, one of the remnants from the ranch of John Vlahos. The newest reserve property acquisition is located south of Monticello Dam and provides spectacular views of Lake Berryessa (see Photo 1.3) and the lower Putah Creek watershed. The reserve is mostly wilderness. The primary trailhead is the starting point for the SCCR's 5-mile loop trail and the steeply sloping Pleasants Ridge Trail, which is



Photo 1.3: Lake Berryessa, view from SCCR on Blue Ridge

on CA DFG property. The reserve's lower Homestead Trail travels along the canyon floor and creates a loop with the Blue Ridge Trail near the stairs above the cold storage foundation and on the north end of the reserve near the switchbacks.

The reserve, trails, programs, and neighboring public open space are possible with help from UC NRS staff, volunteers, and donors, and organizations that work to promote preservation of public natural open space. The Natural History Hike for All Seasons follows the lower Homestead Trail in the SCCR. The Nature Outings program, trail markers, sign-in stations, informational signage at the trailhead and interpretive brochures are produced and maintained by the NRS staff (see Photo 1.4). Many of the trails have been cleared and are maintained with the help of volunteers over the years.

The Janusch property that borders the southern property line of the

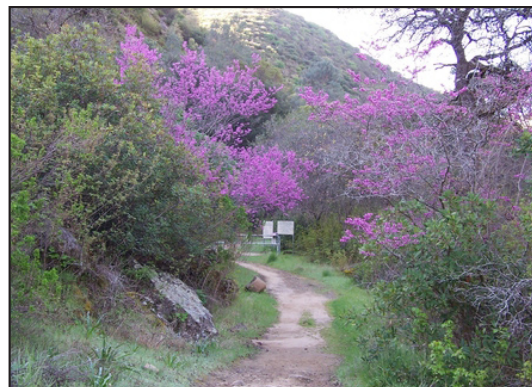


Photo 1.4: Homestead Trailhead sign-in



Photo 1.5: Tuleyome property sign

SCCR was recently acquired with the help of the Tuleyome Organization. Mr. Janusch, a Bay Area resident, had purchased this parcel as a safe-haven during the Cold War in case of an attack on the San Francisco Bay. He had chosen and purchased the parcel without ever visiting it and never developed the land since there was no attack on home soil. This 72-acre parcel contains that land surrounding the Cold Creek Headwaters.

The Tuleyome Organization was able to raise enough donations to clear escrow on the property this April and started clearing trails right away. The 1988 firebreak trail was cleared to extend the SCCR trail system to the public. Signs were recently installed to indicate property boundaries and trail names. Once trails are established through this parcel, the Tuleyome Organization plans on donating the property to the UC NRS as an extension to the SCCR.

Site Analysis

Regional Context & Adjacent Landowners

Cold Canyon is part of the Vaca Mountains, the eastern-most ridge of the California Northern Inner Coastal Mountain Range. The SCCR is located in the drainage of the Cold Creek and Wild Horse Creek, which lie in both Solano and Napa Counties (Weathers, v). Located about ten miles east, the town of Winters is the closest developed community to the reserve. Vacaville is the closest city to the south (about 23 miles driving). Most of the other communities near the SCCR are smaller and rural.

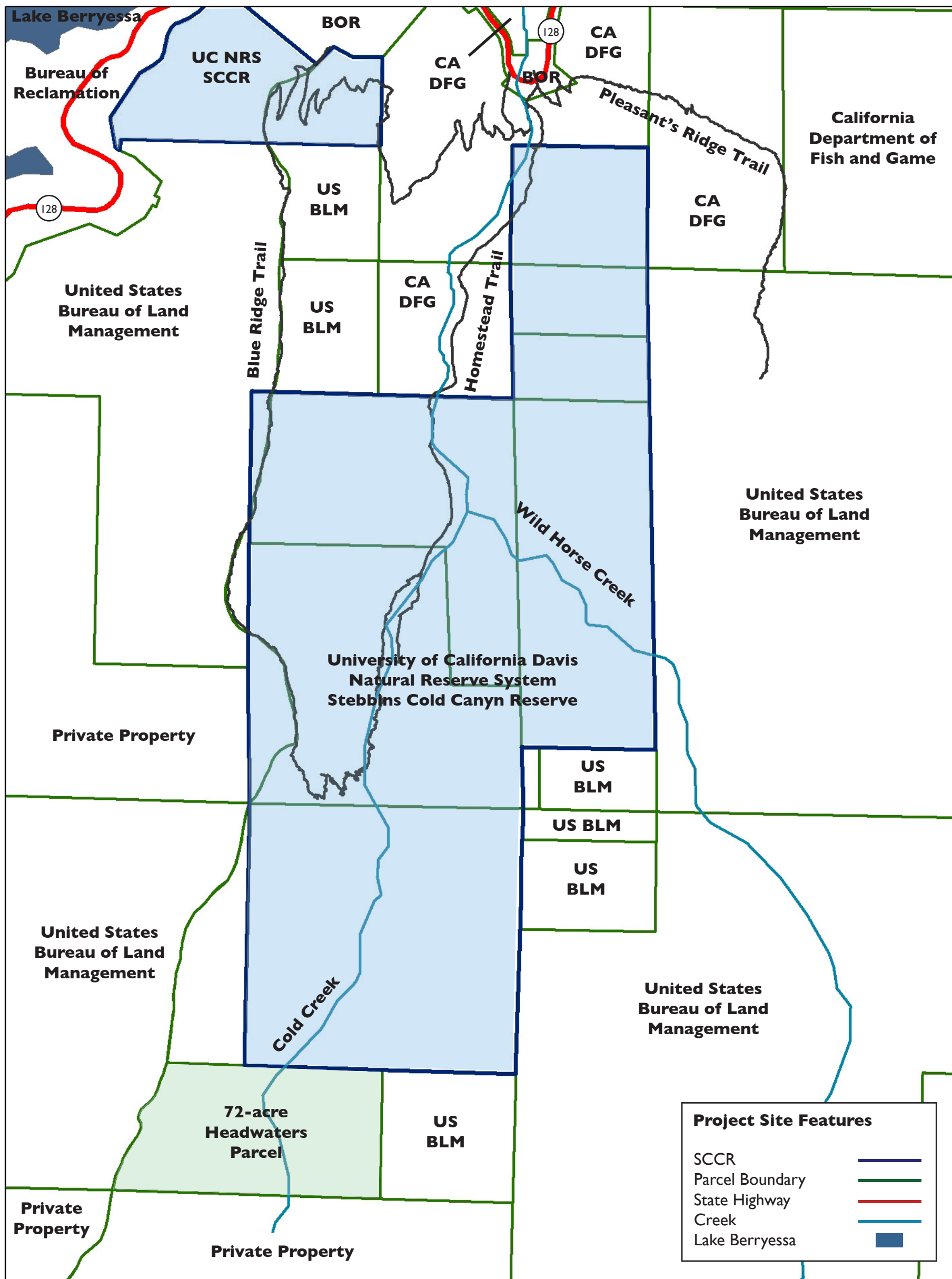
The majority of the land surrounding the SCCR is public. Public agencies that own and manage adjacent property to SCCR include the California Department of Fish and Game (CA DFG), United States Bureau of Land Management (BLM), and the Bureau of Reclamation (BOR) (see parcel map on page 9). With the recent acquisition of the Cold Creek headwaters parcel by the Tuleyome Organization, there are only two other privately owned properties that abut the SCCR currently.

Regional Open Space System

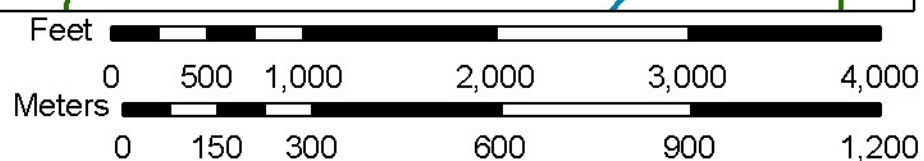
Regional trail systems are great ways to create interconnected green space systems on a large scale. They can provide habitat and safe passage routes for many animals while offering open space experiences for people. One project that is currently in the halls of Washington D.C. is the proposed Berryessa-Snow Mountain (BSM) National Conservation Area (NCA) (see BSM Map on page 10). The BSM NCA will encompass as much as 500,000 acres of public lands in the region providing opportunities for landscape scale management and protection for this special

place (BSM Newsletter 2). The proposed NCA ranges from Putah Creek on the south, nearly 90 miles north to Snow Mountain (BSM Newsletter, 2). The proposed National Conservation Area is supported by The Wilderness Society as well as by Tuleyome, Defenders of Wildlife, Sierra Club, California Wilderness Coalition, Berryessa Trails and Conservation, and the California Native Plant Society — Sacramento Valley Chapter. The public land managers in the BSM region include the Federal Mendocino National Forest, Bureau of Land Management, and Bureau of Reclamation, the

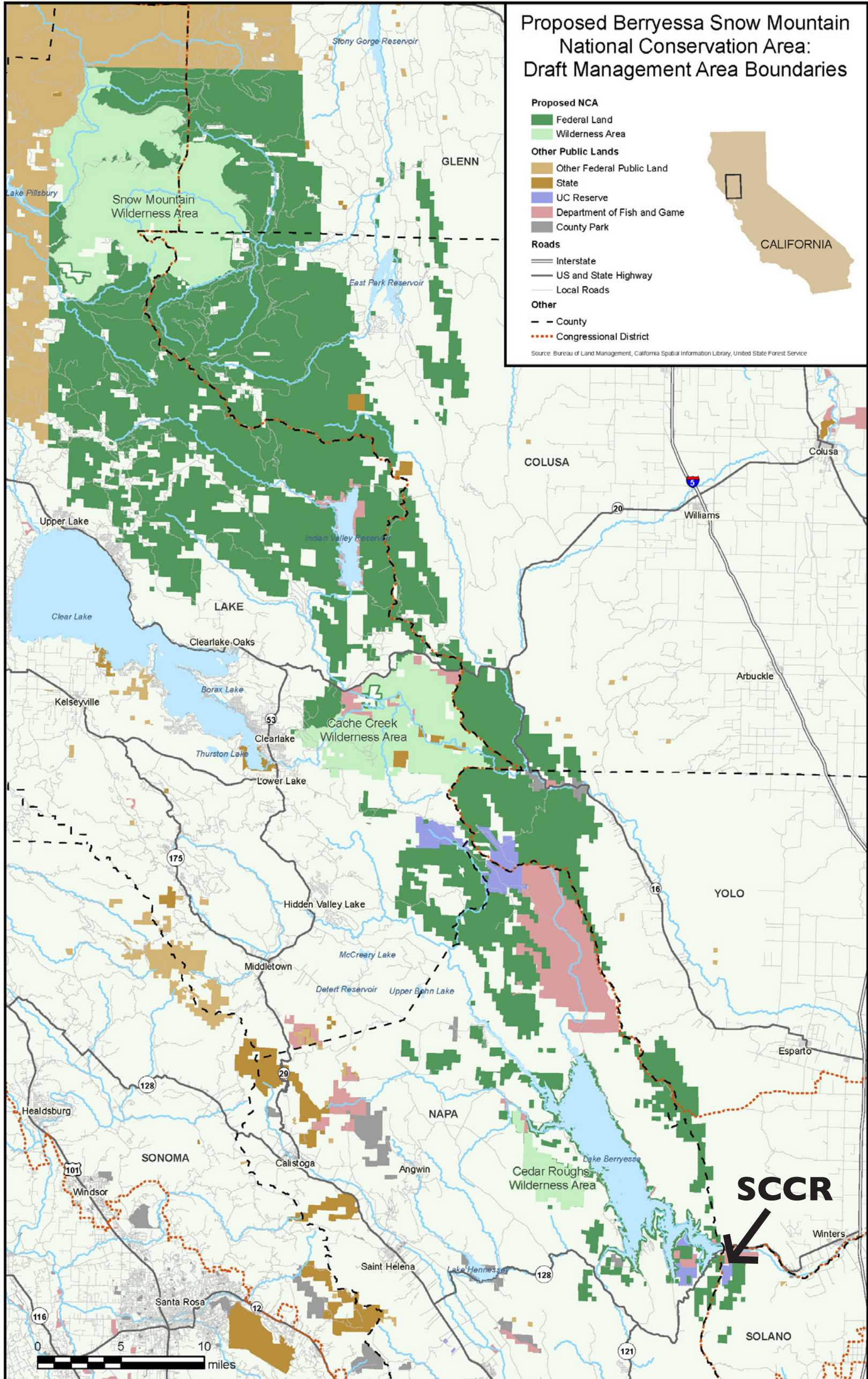
Parcel Boundaries



Source: CASIL
 Datum: NAD 83
 Projection: UTM Zone 10N
 Cartographer: Tara Hanlon



Berryessa-Snow Mountain proposed National Conservation Area



California Department of Fish and Game and Departments of Parks and Recreation, and the UC Natural Reserve System and local county parks and districts (BSM Management Proposal, 39).

Putah Creek, Cache Creek, Stony Creek and the Eel River are the life-blood of the proposed Berryessa-Snow Mountain National Conservation Area. The region is a vitally important part

of the California Floristic Province, which is one of the 25 biological “hotspots” on the planet, and there are three migratory corridors for animals that traverse the region (BSM Newsletter, 2). The natural landscape also provides water for nearby urban populations and agricultural operations in other areas (BSM Newsletter, 2).

Proposed Trail Connections to SCCR

The Bureau of Reclamation (BOR) manages Lake Berryessa and is presently implementing a new, recently established Visitor Service Plan, which makes significant changes to land use around the lake (BSM Management Proposal 42). One of the changes includes the BOR partnering with other government agencies, private landowners, and private organizations to design and construct a regional trail system for nonmotorized recreation, which is to include a multipurpose shoreline trail (BSM Management Proposal 42). Berryessa Trails and Conservation, a local nonprofit agency, is actively working with the BOR on the planning and development of a 150-mile trail system that will circle the lake (BSM Management Proposal 42-43). The two ends of this proposed trail will most

likely terminate near SCCR, near Monticello Dam. One end would be where State Highway 128 crosses Putah Creek. The other end of this looping trail would terminate on the southern side of Montidello Dam.

To the north of SCCR is a proposed trail that will cross through the adjacent valley from Putah Creek. This trail is planned to connect the 150-mile Lake Berryessa loop trail on the north side of Monticello Dam, cross up and over the ridgeline and down the adjacent valley near the bridge that crosses Putah Creek. After crossing over the bridge, hikers could enter the SCCR, and travel up the switchbacks on the ridgeline trail to the Blue Ridge. From this point, another proposed trail would link hikers back down

to the Lake Berryessa Loop Trail. The last connector piece here would link the northern peak of the Blue Ridge Trail in SCCR down the western slope of the Blue Ridge, cross State Highway 128 and link up to the Lake Berryessa Loop Trail. For a visual

representation of these trails, see the Master Trail Plan on page 29. Trail connections through SCCR would allow people to complete the full loop around Lake Berryessa.

Natural Conditions

The climate in the SCCR is considered Mediterranean, with hot dry summers and cool wet winters. Air temperatures within the reserve vary with elevation, terrain, and slope aspect (Weathers, 4). The Pacific Ocean dictates a lot of the weather patterns that occur in the Northern California Inner Coastal Mountain Range. During most of the year, a high-pressure zone following the coast of California prevents low-pressure storms that inundate the northwest coast from reaching much of Northern California (Shannon, 13). The high-pressure zone breaks down during the winter allowing storm systems to move farther south (Shannon, 13). The average precipitation in the reserve is 52 centimeters (20 inches) per year with average temperatures ranging from 8° C (46° F) in January to 28° C (82° F) in July (SCCR Website).

The present landforms of Cold Canyon are the products

of three slow but very active geologic processes: deposition of sediments, continental uplift, and erosion (Shannon, 14). Millions of years ago river delta sediments flowed into the sea where some of the sediments settled on the continental shelf (Shannon, 14). Undersea landslides called turbidites would fall off the continental shelf and settle into layers to create beds of silt at the bottom of the sea (Shannon, 14). This process created the Yolo Formation, which can be found along the bed of Cold Creek, where fossils of marine organisms can be found in this mudstone (Weathers, 6). As deposition was occurring millions of years ago, the entire continent was slowly rising (Shannon, 15). California's Coast Range was formed when oceanic plates collided and the denser oceanic plates dove under the other plates into the interior of the Earth (Shannon, 15). The strata of the uplifted fan now strike roughly

north-south to the east of Cold Creek (Weathers, 6) in the more resistant Sites and Venado Formation sandstone layers (Shannon, 16). Erosion through physical and chemical weathering occurs naturally in the reserve through running water and landslides. Cold Canyon was created by erosion in the Yolo Formation, which is the fine-grained mudstone along the creek bed (Shannon, 16). Large scale erosion can be seen from the several smaller recent landslides and other much larger landslides that occurred thousands of years ago (Shannon, 16).

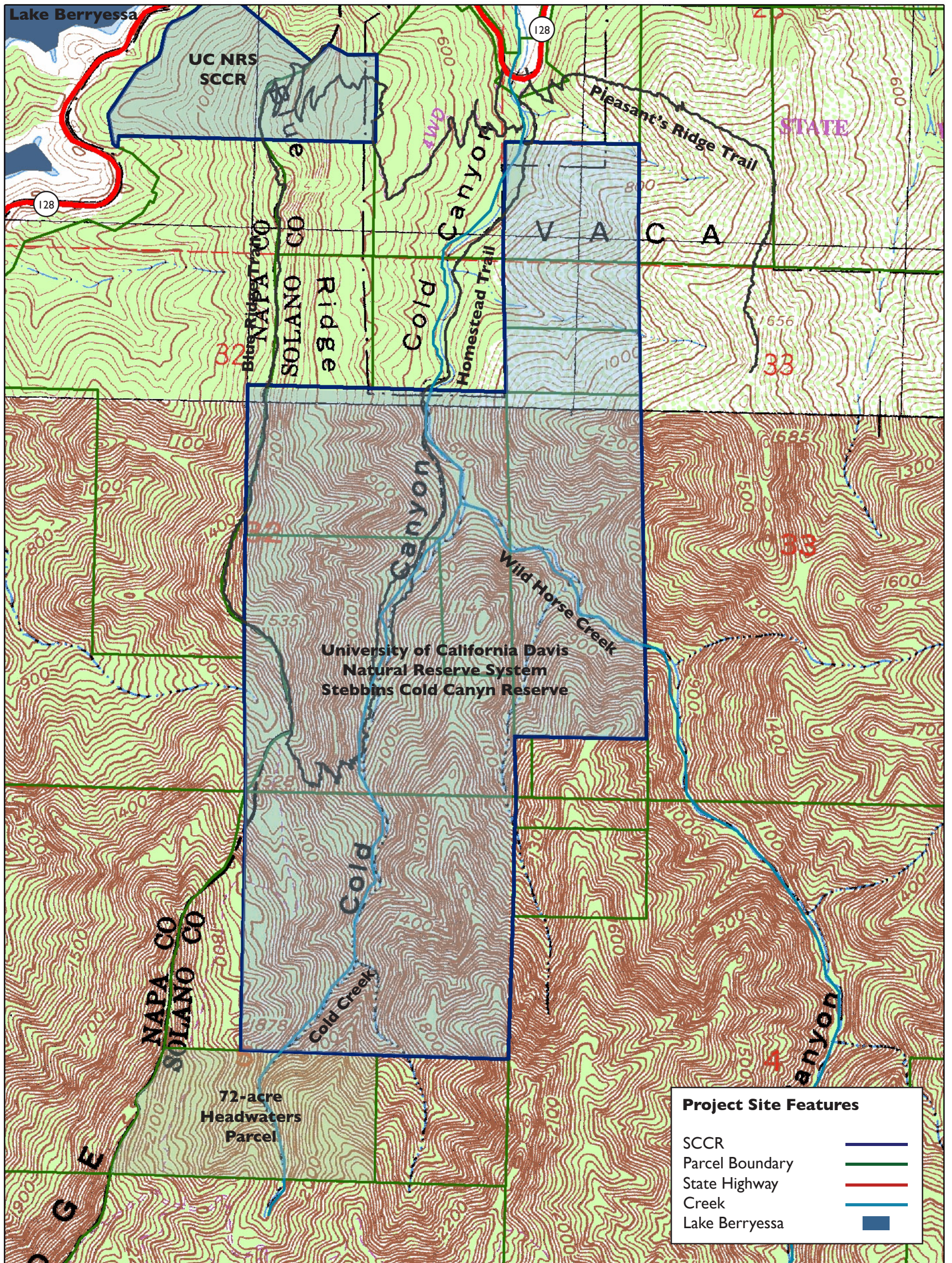
The SCCR topography is steeply sloping with no flat land (SCCR Website). The elevation changes from 91 meters near the entrance of the reserve up to 762 meters (300 to 2,500 feet) on the ridgeline (SCCR Website). Rock outcropping that were pushed up from continental movement are some of the steepest areas in and around the reserve. Geologic processes, described above, are the causes of the varied topography in the SCCR (see SCCR Topographic Map on page 14, Aspect Map on page 15 and Slope Analysis Map on page 16).

Hydrologic systems such as watersheds, can be wide ranging with intricate webs of streams. The principle of stream order can help to understand the value of smaller streams, such as Cold Creek,

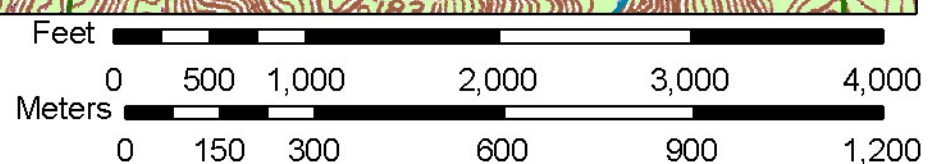
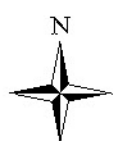
on the overall watershed. Stream order is the relative position, or rank, of a stream in a drainage network (Marsh, 70). Streams without tributaries, usually the small ones, are first-order; streams with two or more first-order tributaries are second-order, and so on (Marsh, 170). Underground springs and small streams flowing into Cold Creek would be first-order streams, while Cold Creek is a second-order stream flowing into the third-order stream of Wild Horse Creek. Wild Horse Creek flows into the fourth-order stream of Putah Creek and ultimately the fifth-order stream of the Sacramento River. Looking at it in a broad scale, the Sacramento River Watershed can be replenished with cleansing and refreshing waters that originate at the SCCR.

Monticello Dam has affected Putah Creek's tributaries (EDAW/AECOM, 27). Historic floodwaters from Putah Creek would back up into its tributaries, but because of regulated dam releases, water flows below the levels of its tributaries causing the tributaries' flows to accelerate as they enter the creek (EDAW/AECOM, 28). It is possible that low flows created by limited water releases from the reservoir have eliminated some of the aquatic species that may have seasonally used Cold and Wild Horse Creeks (Shannon, 11).

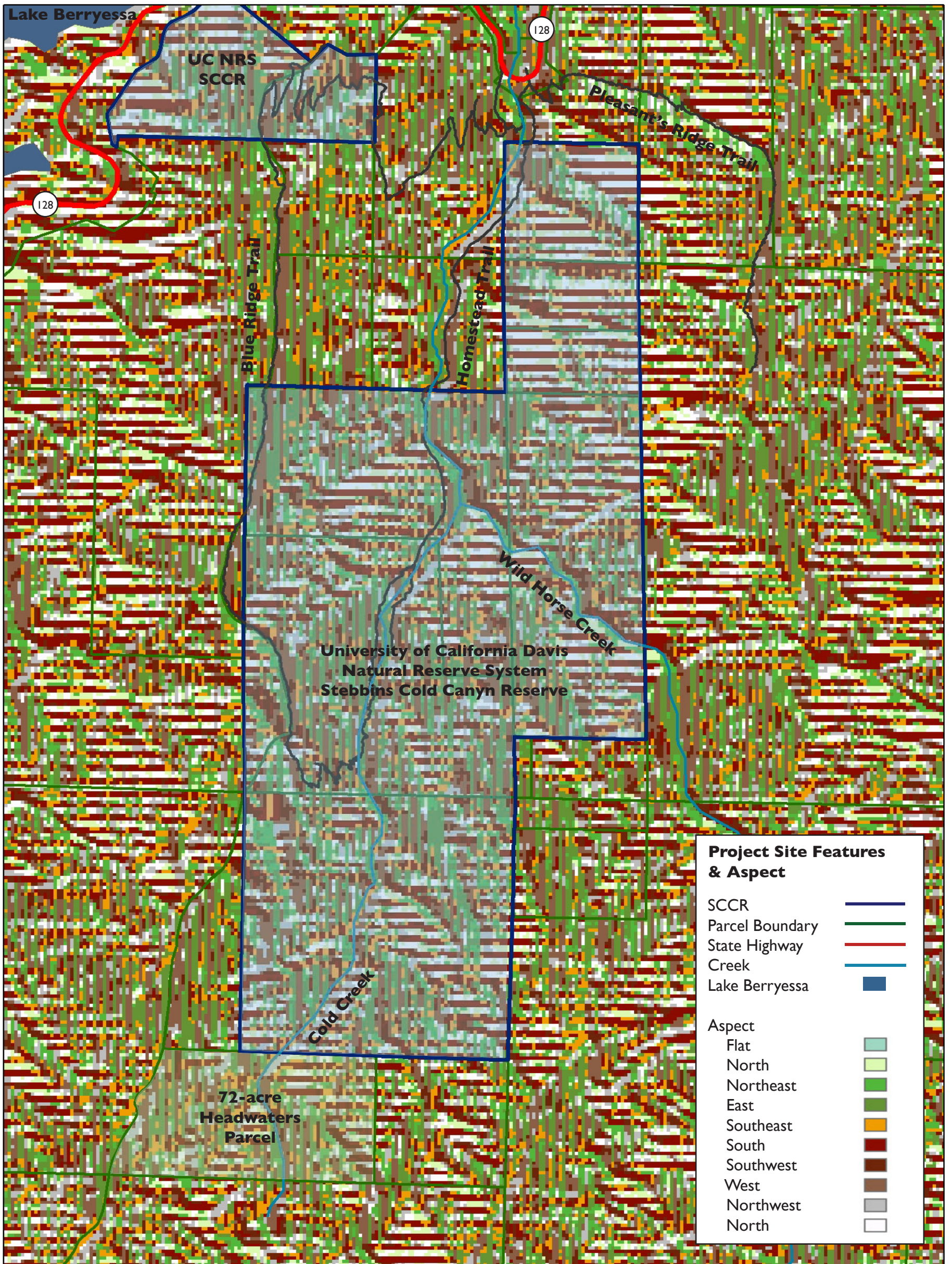
Topography



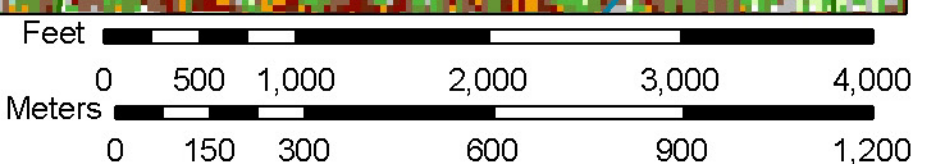
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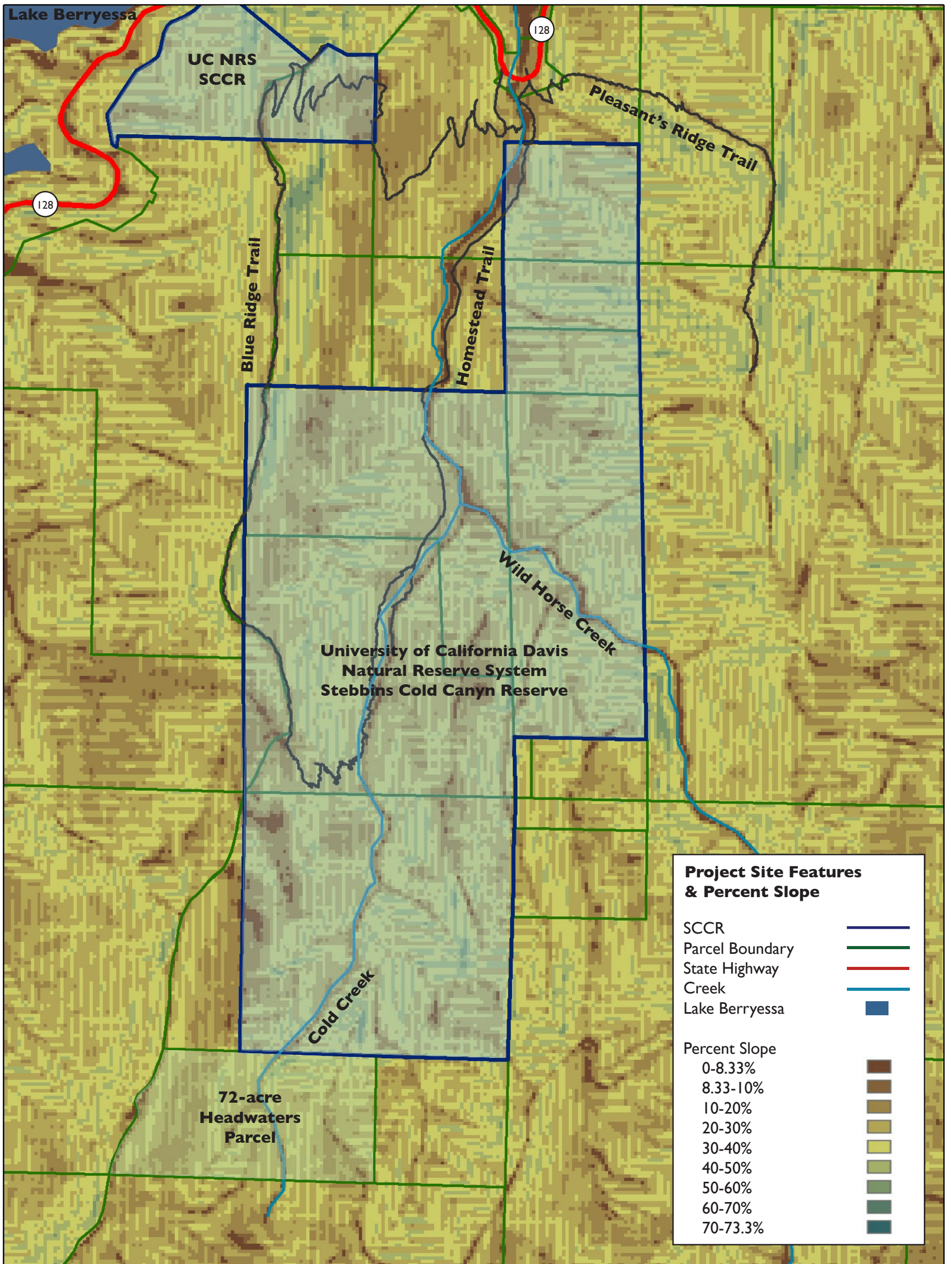
Aspect



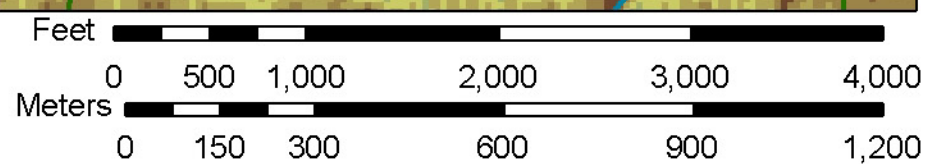
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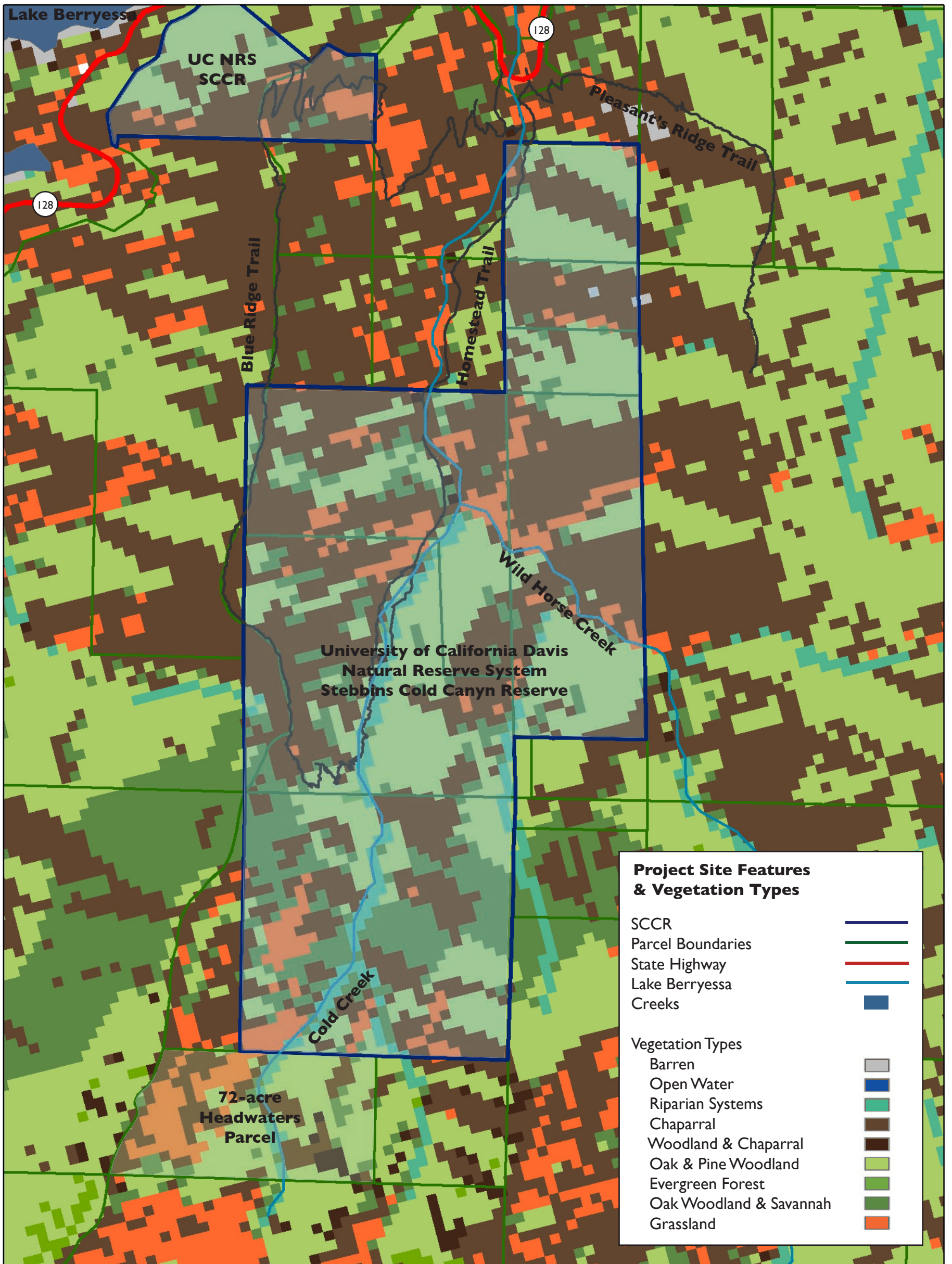
Slope Analysis



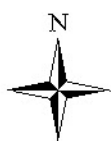
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 Projection: UTM Zone 10N
 Cartographer: Tara Hanlon



Vegetation Types



Source: CASIL
 Datum: NAD 83
 Projection: UTM Zone 10N
 Cartographer: Tara Hanlon



The heterogeneous physiographic nature of the area provides diverse habitats that support examples of several biotic communities found in the Northern Coast Ranges (Weathers, 2) (see Vegetation Type Map on page 17). Six distinct habitats occur within the reserve: grassland, savanna, chaparral, chamisal, live oak woodland, and riparian riverside woodland (Weathers, 2). The NRS recognizes five habitats within the SCCR on their website. The five primary habitats are described here in more detail.

Grassland areas are primarily covered with grasses and annual plants with little tree or shrub cover. They are usually found on south-facing slopes,



Photo 2.1: Savanna on Pleasants Ridge, view from SCCR

as they can tolerate the harsh summer microclimate. Grasslands temporarily occupy disturbed areas, such as where a fire or landslide occurred. The European settlers of California brought new grasses and forbs, mostly annual exotic species, that now dominate the grasslands of SCCR.

Savanna has an understory of grasses and forbs with scattered trees (see Photo 2.1). The few trees that survive in this habitat type are limited due to the availability of water. If more water were available, more trees would grow and the habitat would then be woodland. Two drought tolerant species found in SCCR's savanna are the blue oak (*Quercus douglasii*) and foothill pine (*Pinus sabiniana*).

Chaparral is the most common habitat type of the SCCR (see Photo 2.3). It has a dense mixture of shrubs that grow from 3 to 9 feet tall, with chamise (*Adenostoma fasciculatum*) as the most commonly found species. Chamise changes the soil characteristics by producing a substance from its roots that prevents many other plants from growing nearby, thereby reducing competition by other plants that may try to grow in the same area. Other chaparral shrubs of SCCR include manzanita (*Arctostaphylos manzanita*), scrub oak (*Quercus beberidifolia*), toyon (*Heteromeles arbutifolia*), and buck brush (*Ceanothus cuneatus*).

On hillsides where water is more available, live oak woodland can be found (see Photo 2.3). The most common

species found in this habitat type is the interior live oak (*Quercus wislizenii*), an evergreen tree. Other plants commonly found in live oak woodland are foothill pine (*Pinus sabiniana*), blue oak (*Quercus douglasii*), manzanita (*Arctostaphylos manzanita*), buck brush (*Ceanothus* spp.), California coffee berry (*Rhamnus californica*), and buckeye (*Aesculus californica*).

Riparian woodlands are the forests associated with streams and can be found along the interface of water bodies and adjacent upland areas (see Photo 2.4). These plants require a regular water source and often help stabilize soils on banks with their root systems. Some of the riparian plants that can be found at the water's edge in SCCR include



Photo 2.3: Chaparral with woodland above, along Wild Horse Creek wilderness

the Fremont cottonwood (*Populus fremontii*) and willows (*Salix* spp.). California bay (*Umbellularia californica*), Western redbud (*Cercis occidentalis*), spice-bush (*Calycanthus occidentalis*), and bigleaf maple (*Acer macrophyllum*) are a few other riparian plants in SCCR. Some riparian plant species that are associated with other vegetation types include the buckeye (*Aesulus californica*) and interior live oak (*Quercus wixlizenii*).v

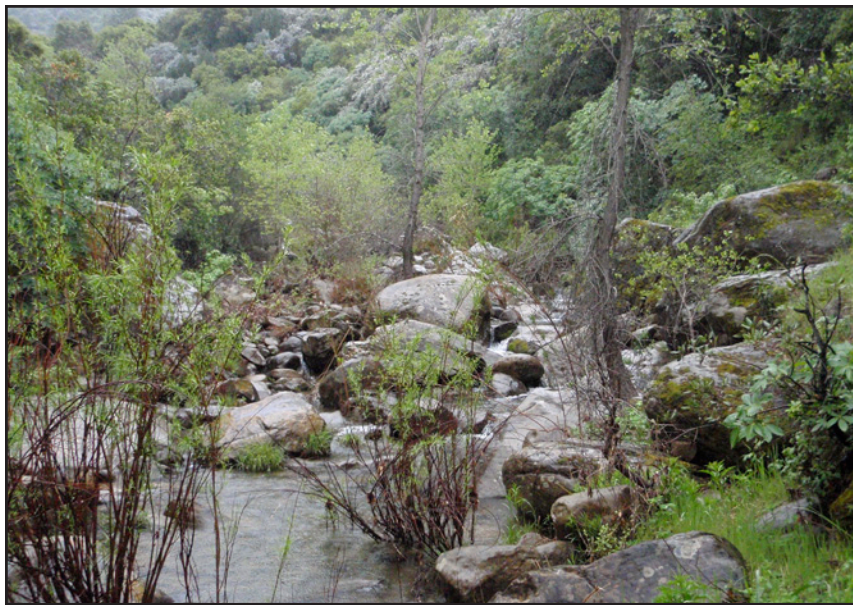


Photo 2.4: Riparian habitat along Wild Horse Creek



Photo 2.5: Pleasants Ridge, North- & south-facing slopes

Microclimates depict what vegetation can grow in certain areas. Mild microclimates exist in wet areas, shaded areas, and on north-facing slopes, while the harshest climates exist in rocky, bare, sunny areas, and on south-facing slopes (Shannon, 19). Pleasants Ridge is a prime example where vegetation type is depicted by microclimate. The north-facing slopes of Pleasants Ridge are chaparral and the south-facing slopes are grasslands, as seen in Photo 2.5.

Human Aspects

The SCCR is reserved to protect a natural area of California to be made accessible for teaching and research. This was the original intention of use for this special wilderness, but usage by the public continues to increase over the years. Shane Waddell is the only roving manager for SCCR. It can be very difficult for one person to attend to the needs of 4000+ visitors annually (Weathers 8). The sign-in sheet at the trailhead to the reserve is one of the only records for the reserve manager to keep track of users. There was a user survey conducted in 1982, but current information was not available. Trail building is underway on the adjacent 72-acre parcel as well as various trails being proposed in the region around SCCR. Current use characteristics and patterns would be necessary to design a master trail plan that would respond to the users of the reserve today and in the future. A survey was conducted with the Stebbins Cold Canyon Reserve and Putah Creek Committee listservs online this May. Survey responses for this project provided a better understanding of current SCCR users. A complete summary of survey results is included in Appendix A of this document.

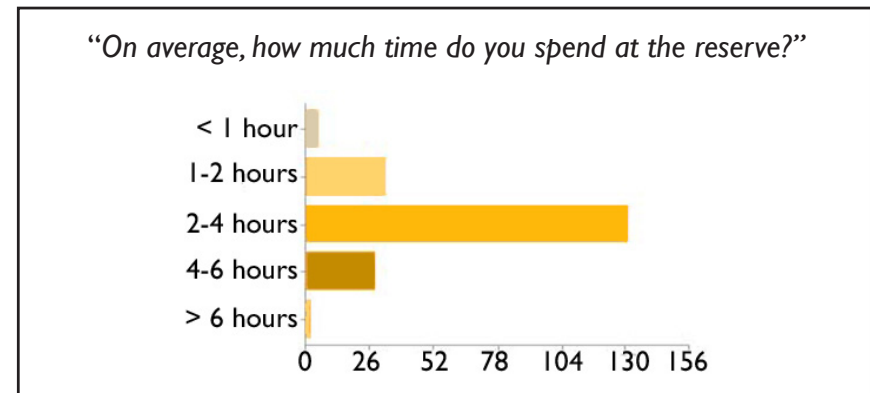


Chart 2.1: Responses to survey question 2

Information on the frequency, duration of visit, and seasonal timing of visits to the reserve were collected. Responses to these questions helped determine when people came, how long they stayed (see Chart 2.1), and how familiar they are with the reserve. 46% of respondents have visited the reserve frequently (more than 7 times), 34% have visited the SCCR occasionally (3-6 times), 17% have visited SCCR rarely (1-2 times), and only 4% indicated that they have never been to the reserve. 65% of respondents said that they usually spend two to four hours at the reserve when they

visit. Trends of peak seasonal usage correspond with temperate weather and blooming of plants. 88% indicated that they normally visit in spring, when weather warms and wildflowers and biological activities of spring arrive (Weathers 15-16). Usage decreases in a similar pattern that was found in the 1982 survey: 59% indicated that they normally visit in fall, 38% normally visit in summer, and 31% normally visit in winter. The 1982 survey found that activity in fall was high due to return of classes and research activity, summer was lower due to the extremely hot and dry conditions, and winter activity was lowest because of the rainy months (Weathers 15).

Survey participants were asked for their reason for visiting the reserve, if they had attended any UC Reserve Nature Outings, and if they ever participated in the Natural History Hike along Cold Canyon's Homestead Trail. This information helped determine what activities visitors participated in and if they took advantage of the educational opportunities that exist at SCCR. Knowing the types of uses for which people come can help determine which activities to maintain or expand in the master trail plan design. Among the various reasons for which people visit the reserve, most respondents hike, take photographs, bird watch, and socialize (see Chart 2.2). 60% of respondents said that they

had attended an organized UC Reserve Nature Outing while only 27% of respondents indicated that they had participated in the Natural History Hike along SCCR's Homestead Trail (following the brochure and numbered trail markers).

Respondents were asked if they eat at the reserve and if they could suggest improvements to the reserve. These questions were asked to determine what types of site features would be wanted or needed in the master trail plan. 73% of the respondents

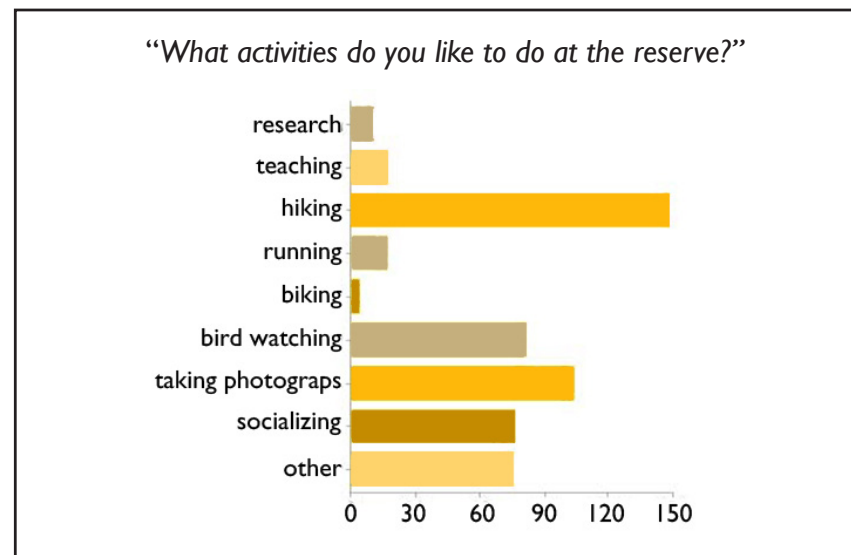


Chart 2.2: Responses to survey question 5

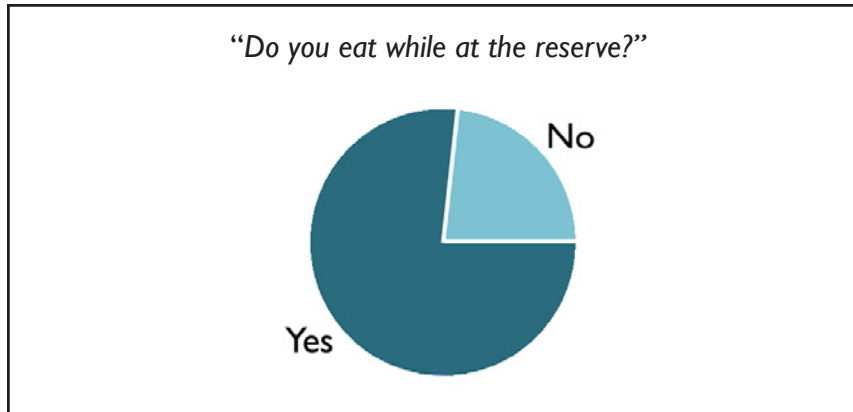


Chart 2.3: Responses to survey question 5

eat at the reserve (see Chart 2.3), but there are no designated picnic tables or eating areas. A variety of responses were given for things to include at the reserve. Some of the suggestions include:

- Add pedestrian striping between the trailhead and the parking lot. It is not at very safe crossing.
- Include more signage about restoration projects—why they were done, what’s in there now? I’d also like to see profiles of the UCD students, staff, and faculty who are conducting research at Stebbins, so people appreciate how valuable it is to academia.
- Maybe some picnic tables and a trash bin at the clearing where the ridge trail branches off would be nice.

- Put a bathroom in the parking lot.
- Make better trail signs and markers.
- I would like a longer loop trail.
- There should be more trails.
- There should be picnic benches.
- Having a porta-potty would be helpful.
- I’d like to see more placards to ID trees, plants, and rocks.
- There should be more signs at trail forks.
- Allow dogs on the entire trail.
- Non-toxic poison oak control would be appreciated.
- There should be more parking in the future.
- More shady spots to sit.
- Prescribed burns.
- More trails!

Volunteer activity is beneficial to the ongoing maintenance and management needs of the SCCR. While only 17% of respondents indicated that they had volunteered at the reserve in the past, the type of volunteer activities varied greatly. On the following page is a sampling of descriptions about volunteer activities in which respondents had participated in:

– I’ve led a number of hikes before the current formal program started, several times for Duck Days. I also helped a UC Davis plant science class visit SCCR to see spring flora.

– I have been a volunteer guide for 6 years. Currently, I lead three hikes per year (Watercolor painting (spring), wildflowers (spring), and botany (fall)). I have also volunteered for a few trail maintenance hikes, probably three times (one each in 2006, 2007, and 2008). I also volunteered to lead a student group to the reserve as a half-day classroom event for a small school in Winters (2008).

– I have helped with trail maintenance on many occasions when hiking the loop.

– I helped put in mile markers as part of a girl scout project.

– I have helped work on the trails.

– I removed goat weed.

– I have helped with photography for children’s walks.

– I planted native grasses by the homestead.

– I lead Sierra Club hikes to the homestead and Blue Ridge.

– I gave the “Bugs in the Night” program twice.



Understanding the Analysis

Opportunities

Regional benefits of this Master Trail Plan could positively affect a wide array of people. Increased use at the reserve has potential for economic benefit to neighboring communities, such as Winters, which is less than 10 miles away from the reserve. It could be a rest stop for recreationalists that pass through on State Highway 128. Connections to other proposed trail systems would link the adjacent areas. The BSM NCA Proposal includes SCCR, which would link open-space systems in this area with regions reaching far northward in the Inner Coastal Mountain Range.

There are opportunities on site that could be enhanced

or accessed. Additional trails, more stacked looping trails, a safer trailhead redesign and additional amenities would promote more people to use the site. There are a few features on site that could be highlighted. There are great viewpoints from the Tuleyome Trail (the old firebreak trail) to the Central Valley and Sutter Buttes. A large rock outcropping on the Cold Creek headwaters parcel could be highlighted as a viewpoint and could offer an opportunity for rock climbing. The large waterfall that is upstream on the Wild Horse Creek is a stunning feature and would promote users on site.

Constraints

Design considerations should address the following issues. Private landowners may not want an increase in site visitors. Funding from donors may be hindered with the economic downturn that we are facing. Widespread ADA accessibility standards are next to impossible to implement because of the topography on this steeply

sloping site. Dog users like to bring their dogs to the reserve but may not like to stay on designated dog trails. Elderberry bush and poison oak are found throughout the reserve. Home for the Valley Elderberry beetle, elderberry bush should not be damaged, while the prevalence of poison oak could be minimized drastically.

Master Plan

Vision, Goals & Objectives

The trail system of SCCR will be interconnected regionally and will better serve its visitors. More trails will be built to provide a greater variety of routes for day use. Amenities will be added to

provide a more comfortable experience for visitors. Parking areas and trailhead access will allow for safer passage of reserve users and wildlife.

Master Trail Plan Design

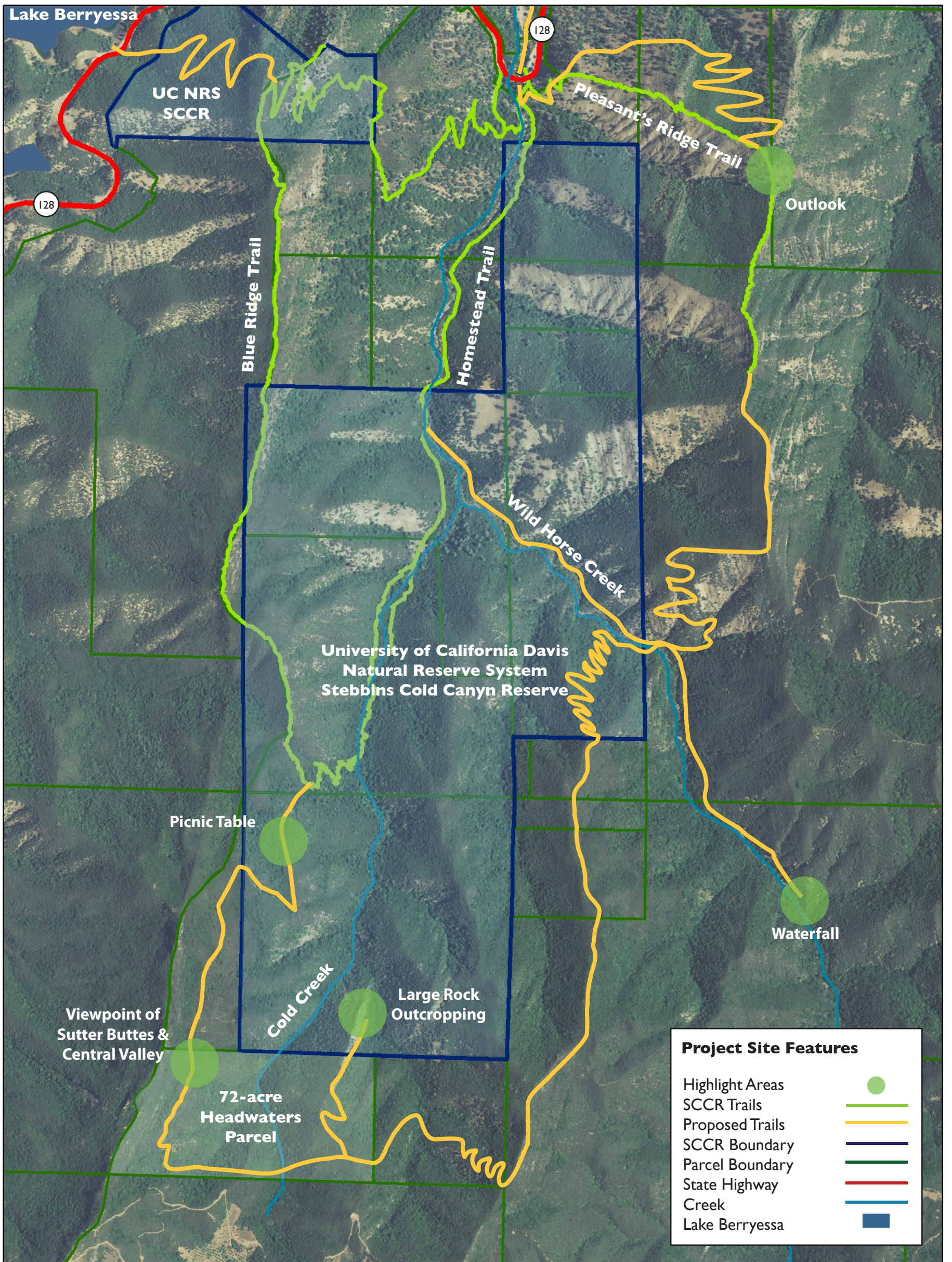


Photo 4.1: Facing south on the top of Pleasants Ridge

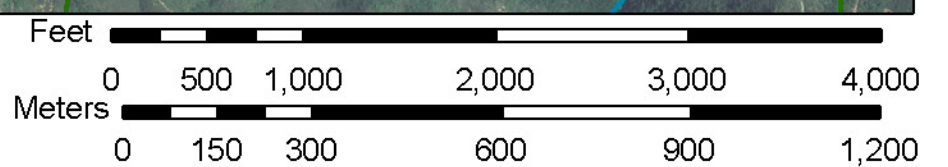
The Master Trail Plan (see page 29) takes advantage of existing conditions in the wilderness areas, incorporates features that reserve users have called a need for, and uses sustainable trail design standards. This plan highlights some natural features and viewpoints existing in the landscape around SCCR. Certain features are incorporated to respond to survey results. The trail system uses sustainable trail design standards on a stacked looping trail system with spur trails in specific areas.

The Pleasants Ridge Trail will have a new trail design that will decrease erosion by following sustainable trail design practices. Instead of traveling up the ridgeline on the steep slope, the trail will cross around the ridgeline to the north and head up to a viewpoint at the top by using switchbacks. The southern portion

Master Trail Plan



Source: CASIL
 Datum: NAD 83
 Projection: UTM Zone 10N
 Cartographer: Tara Hanlon



of the Pleasants Ridge Trail will travel southward along the ridgeline (see Photo 4.1) to the Wild Horse Creek, where it will connect with the largest trail loop that passes through the Cold Creek Headwaters.

The existing Homestead and Blue Ridge looping trail will be expanded. Tuleyome's newly acquired 72-acres around the Cold Creek headwaters will be the first phasing of trail expansion to the SCCR's existing trails. A portion of the Cold Creek headwaters trail was cleared this spring (read more about this trail in the Preface) along an old firebreak. The trail through this parcel can increase overall route options for the reserve if it crosses the new property and loops down the other side of the Cold Creek Headwaters around the large rock outcropping to

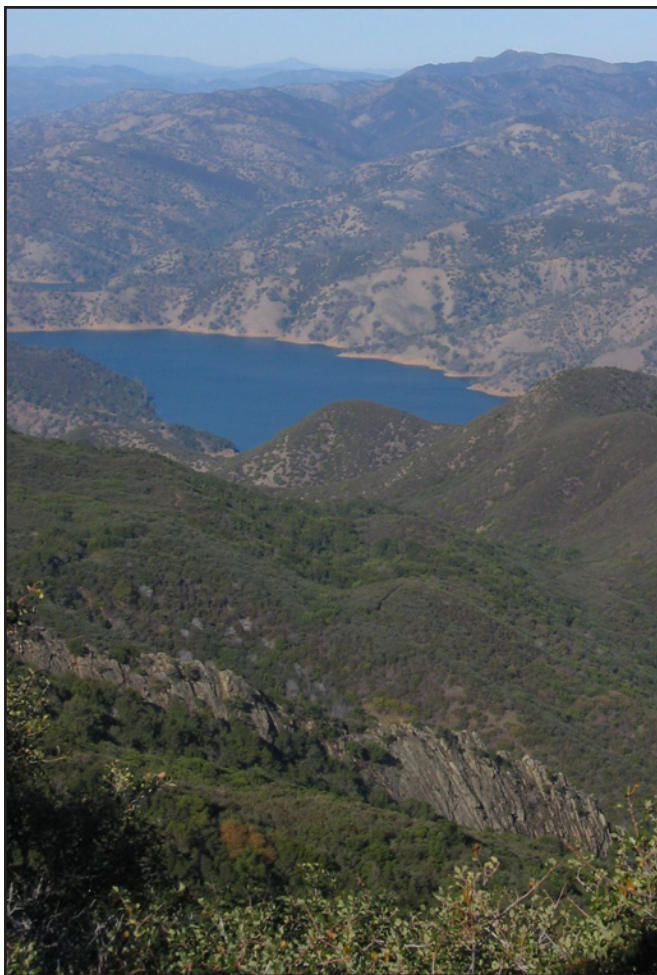


Photo 4.2: Rock outcropping on 72-acre parcel

re-connect with the Homestead Trail. The rock outcropping (see Photo 4.2) will be accessible to rock climbers with the trail passing by bottom of the rock face to allow greater accessibility for bouldering or climbing. There is also a great viewpoint along this firebreak trail of the Sacramento River Valley, with the Sierra Nevada Mountain Range in the distance and a clear view of the Sutter Buttes (on a good visibility day).

Near the connection of the largest looping trail is where a spur trail leads into the Wild Horse Creek wilderness area to a waterfall (see Photo 4.3) that has about a 6-8 foot drop. This waterfall is the largest know falls along the Wild Horse Creek. There is about a 10 foot deep pool a the bottom of the falls that apparently is suitable as a small swimming pool. This natural feature



Photo 4.3: Waterfall along Wild Horse Creek in wilderness area

could become very popular as a destination point if the trail system allows access to this to this area of the wilderness.

The waterfall in the wilderness area on the Wild Horse Creek could have been accessed with the large looping trail passing around it, or with a spur trail that only heads back to the waterfall and back the main area of the reserve. The spur trail option was chosen as a way to allow access to the waterfall while being sensitive the wilderness area. Spur trails are less disruptive to large open wilderness areas and the animals that live there because the number of trail users will be less than if it is accessed with a loop trail.

Sustainable trail design guidelines should be followed with construction of all the new trails. Trail design goals include: direct water to sheet flow, have minimum impact on the environment, and integrate with the environment. According to the International

Mountain Bicycling Association, there are five elements to sustainable trail design: (1) the half rule, (2) the ten percent average guideline, (3) maximum sustainable grade, (4) grade reversals, and (5) outslope.

Incorporating the five elements of sustainable trail design will ensure more enjoyment for users, increase the longevity of trails, and decrease maintenance requirements for reserve managers. The half rule suggests that the grade of a trail should not be greater than half the grade of the hillside or side slope that the trail traverses (IMBA, 63). If a trail's slope is too steep, water will eventually flow on the trail instead of across it and will erode the soils creating gullies. Without intervention erosion can destroy

trails and damage the environment (IMBA, 56). Although it may be impossible to average a ten percent grade on trails from one end to the other, this grade is most sustainable if it can be achieved (IMBA, 64). Grade reversals are spots at which a climbing trail levels out and then changes direction, dropping subtly for 10 to 50 linear feet before rising again (IMBA, 65). Water can exit the trail at the low point where there is a grade reversal, they can help trails endure with minimal maintenance, and they can help users regain their momentum and catch their breath (IMBA, 65). It is recommended to check out the IMBA's trail guide books to learn more about sustainable trail design and building. They are good resources that include helpful imagery to discuss trail design topics.

Trailhead Redesign

The new SCCR Trailhead (see page 35) incorporates a safer access route to cross State Highway 128 and creates a central trailhead for all trails in and around SCCR. It also merges some of the parking and day-use area design ideas proposed by Sienna Millar in her Landscape Architecture senior project, "Exploring Home: A Recreational Day Use and Interpretive Trail at Putah Creek."

Currently (see page 34) there are two large culverts crossing under State Highway 128 near the SCCR trailhead. The culverts were placed when State Highway 128 was laid during the construction of Monticello Dam. They provide space for heavy water flow from the Wild Horse Creek to pass through into Putah Creek. The heavier flows are during the winter rainy season.

A new passageway from the parking area to the trailhead by the existing culverts could provide several benefits. Building a new culvert or tunnel will provide access year-round for people and animals that cross from one side of the highway to the other. It will allow limited trail access for people with disabilities. A tunnel will help direct reserve users to the primary Homestead Trailhead, creating a central trailhead for all existing and proposed trails. Also, tunnels are among the most striking physical features of a trail and one of the most memorable aspects of a trail experience (Flink 82).

A tunnel could provide safe crossing for both trail users and wildlife. Highways are often a location that can be deadly for wildlife. Although the speed limit is lower than most highways, vehicles traveling in the down-slope direction often increase speed right around the sharp turn of State Highway 128 by the SCCR Trailhead. The tunnel should be placed at a higher elevation than the existing culverts to avoid the heavy creek flows, with the bottom of the culvert matching the top height of the existing culverts.

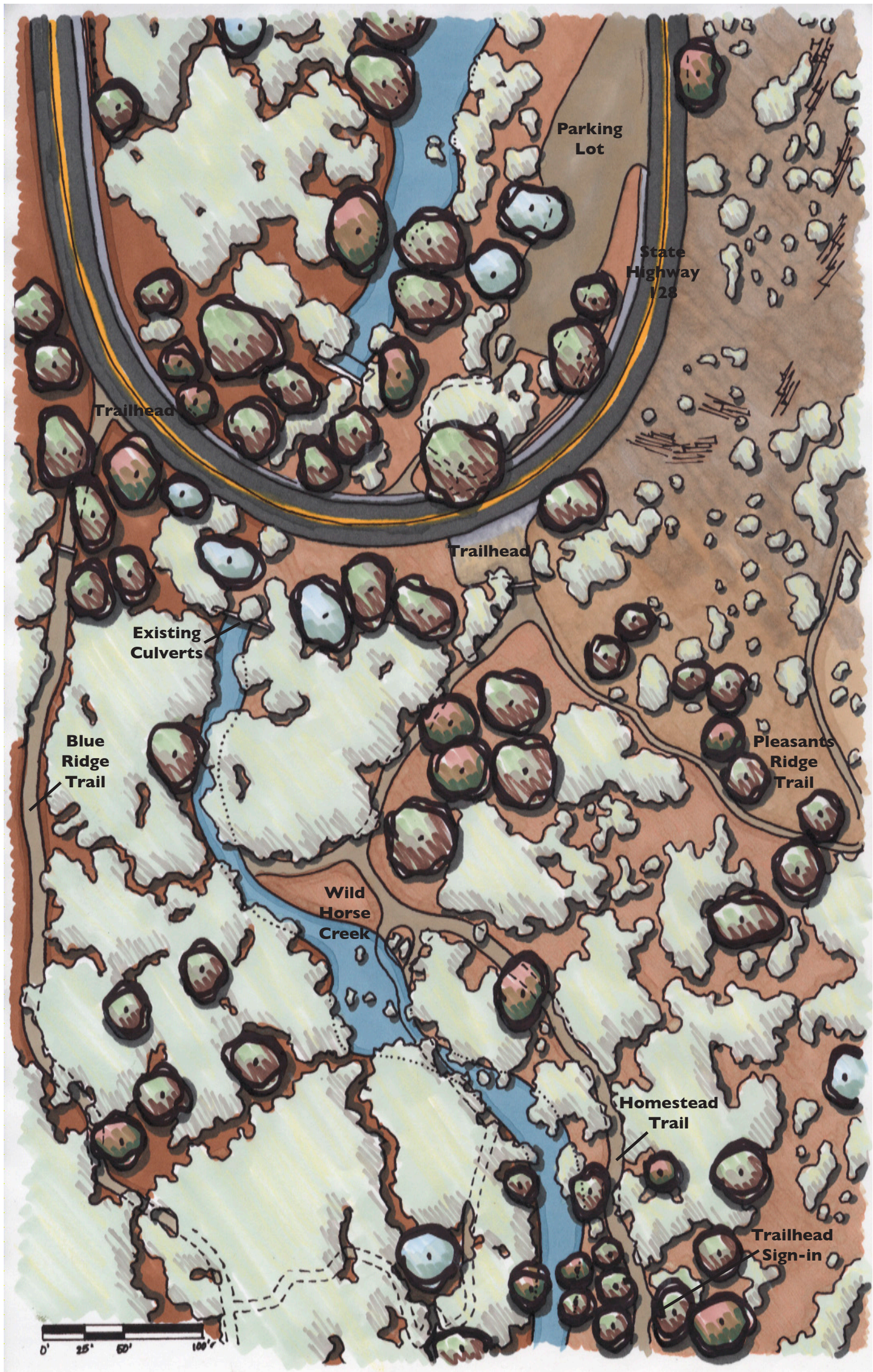
Tunnels throughout the United States were often built for trains so that they could pass through mountainous terrain. Many of these abandoned railroad tunnels are now being used in greenway

networks of cities. Building this proposed tunnel relatively flat, like railroad tunnels, would allow accessibility for people with physical disabilities. S. Millar's project incorporated designing for disabled access, and the tunnel proposed here would allow ADA access from the Putah Creek day use area to a central trailhead in the reserve.

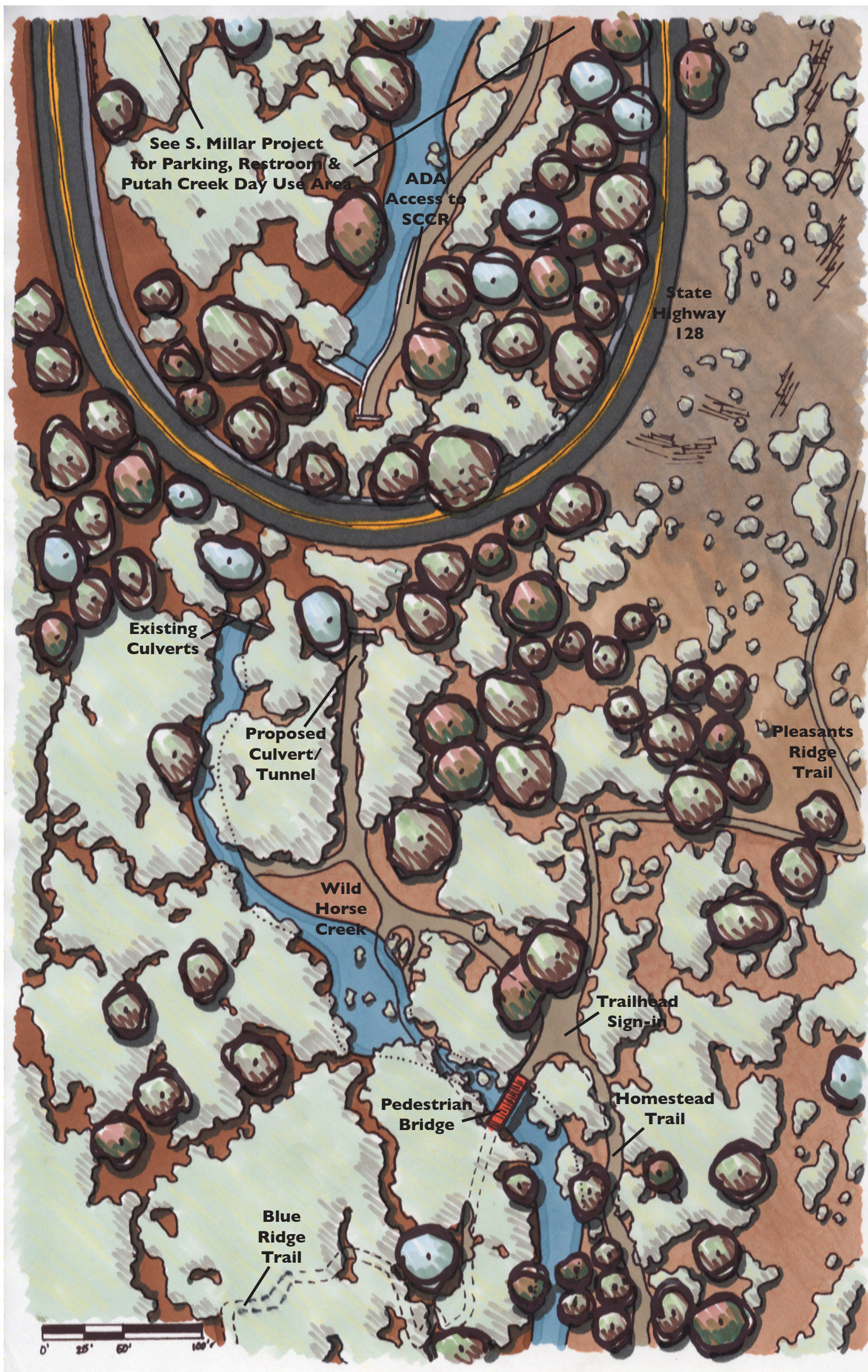
Instead of having two trailheads (one for Blue Ridge Trail and another for the Homestead and Pleasants Ridge Trails), a tunnel could help bring all trailheads to a central location. A tunnel directing reserve users to a central trailhead would eliminate duplicate postings for notices, reserve rules, trail map, and NRS sign-in stations. The tunnel, redirected trailhead to the Homestead Trailhead and a foot bridge crossing Wild Horse Creek would provide access to the Blue Ridge Trail, making the current Blue Ridge Trailhead unnecessary.

The parking area is on CA DFG property and the tunnel under State Highway 128 would be under the jurisdiction of Caltrans. Currently, EDAW/AECOM is designing the parking area north of SCCR and south of Putah Creek for the California Department of Fish and Game. If the proposed tunnel is to be built, agreements or contracts with the CA DFG and Caltrans

Existing SCCR Trailhead Conditions



SCCR Trailhead Redesign



must be made. An alternate design of this area was Seinna Millar's Landscape Architecture Senior Project, which addressed the parking area around the confluence of Wild Horse Creek to Putah Creek. Many of her suggestions are compatible with my trailhead design. The primary issue with her project is the lack of parking. Adding a culvert as an entrance to the reserve will eliminate the closest parking area and the Millar project

A walking bridge has been added near the reserve trailhead that crosses the Wild Horse Creek. This bridge connects the trails on the eastern side of the waterway to the Blue Ridge Trail. The creek is seasonal and most of the year it is easily passable. During the winter season when water levels are higher, this walking bridge will provide access to the trails on the west of the creek.

When the new parking and trailhead access are complete, it may be determined that the older parking and trail entries may

need access restriction. Bollards are a commonly used method of controlling motor vehicle access (Flink 85), but boulders would be a more suitable feature to use because they are a material that is found on site. Barriers should be well marked and visible to bicyclists and motorists, day or night (usually by installing reflectors or reflector tape) (Flink 85).

If a tunnel as a road crossing cannot be realized, then there are other measures to consider for safety of people crossing the highway. Road signs along the roadway that can be read from both directions would indicate to drivers that there is a trailhead up ahead. Drivers would be more likely to slow down if they know that people may likely be crossing their path. A painted crosswalk on the highway at the primary trailhead would indicate a more precise location for drivers to acknowledge a pedestrian crossing.

Conclusion

This project is a tool for managers and organizations working to expand and develop the trail systems. The reserve and the Tuleyome Organization are working with adjacent landowners to provide access to land for public trails. Agreement upon rights and availability for the use of the land can take many years. It takes much time and energy from dedicated individuals to follow through with the mission of providing public spaces within wilderness areas of California. One of the biggest challenges of this project was managing the research and design time. In order to give an educated and involved design for the site, one needs to understand the history and previously applied plans. The combination of these allows for a better design process and analysis of architectural ideas. My learning over the course of the project includes information and familiarity with the geology, topography, and especially natural

systems of the site. The research done with the master plan process and trail design standards were particularly beneficial, but could have been expounded upon interminably. The survey conducted had a large amount of responses, but the time constraints did not allow for thorough evaluation to all issues that arose. Although the investigations of this region and other wilderness areas could envelop tenfold the time and energy put into this project, the realization that ongoing efforts are necessary is a driving force for my future inquiries. This will be a continuously diversifying project and I am excited to be involved with the future investments of time and energy into the development of this and other natural open wilderness spaces of California. It is my hope that the Tuleyome Organization and the UC NRS find and appreciate the possible benefits of this report in their future endeavors.

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Appendix A

Survey Process and Results

Since current SCCR user information was not accessible from available sources, I created a survey to get a better understanding of how people familiar with the reserve use it (see survey sample questions below). Shane Waddell, Projects Manager for the UC Davis Natural Reserve System, provided access to the Stebbins Cold Canyon Reserve listserv and the Putah Creek Committee listserv. The survey questions were created, tested (by Patsy Owens, Claire Ray, and Robin Brown-Ward), online format set up (as a Google Document), and e-mailed to Shane with an introductory letter to gather responses. The introductory letter

of my project describing the purpose of the survey was sent with a link to the online survey embedded. The introductory letter is posted below (see Image). The link in the e-mail that respondents used was set in the Google Document to receive responses for approximately 2 weeks. Within the time frame that responses were accepted, 203 were collected, which was more than I had thought I would get. The final responses were tabulated and represented in chart format (see charts below), except for questions that were set up to gather open-ended responses.

Introductory Letter

Hello,

I am a senior landscape architecture student attending the University of California Davis. In this major we are required to complete a senior project which compiles either research findings or a combination of research and design into a booklet to submit as a graduation requirement at the end of our undergraduate student career. The title of my senior project is “The Stebbins Cold Canyon Reserve: Master Trail Plan,” and I will be creating a trail design for the newly acquired 72-acre parcel around the Cold Creek headwaters, expanding the trail system onto public land, as well as addressing parking and trail access.

You have received this e-mail because you have shown interest in either the Putah Creek or Stebbins Cold Canyon Reserves. I am requesting your assistance to help me find out more about the way you use the Stebbins Cold Canyon Reserve or your opinions about it. The responses you give will help determine my design. In order to complete my project on time, I need to receive your response by May 5, 2010. The survey is available through the link below. There are about 20 questions and it took under 5 minutes to complete the survey during trial runs. Please help

make my project more responsive to your concerns and opinions by filling out and submitting the survey.

Click this link to take the survey: <https://spreadsheets0.google.com/viewform?formkey=dFNZa2FnTl9lVjgzVWxINWtSQkltM0E6MQ>

For those interested in finding more information about my project, it will be posted shortly after graduation on the UC Davis Landscape Architecture Program website, <http://lda.ucdavis.edu/people/students.html>. Also, you are more than welcome to attend my final project presentation on Friday, June 11, 2010. It will be held in Room 166 Hunt Hall from 9:00 - 9:45AM and there will be time for questions/comments after the presentation. If you have any other questions, please e-mail me at the address below.

Thank you for taking 5 minutes to fill out the survey. Your help is appreciated!

Tara Hanlon

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Survey Questions & Response Options

1. How many times have you visited the reserve?
 - a. Never
 - b. Rarely (1-2 times)
 - c. Occasionally (3-6 times)
 - d. Frequently (7 or more times)

2. On average, how much time do you spend at the reserve?
 - a. Less than 1 hour
 - b. 1-2 hours
 - c. 2-4 hours
 - d. 4-6 hours
 - e. 6 or more hours

3. During what season(s) do you normally visit? (People were able to select more than one option.)
 - a. Spring
 - b. Summer
 - c. Fall
 - d. Winter

4. What is your primary reason for visiting the reserve?
 - a. (Open-ended response, short answer)

5. What other activities do you like to do at the reserve? (Select all that apply)
 - a. Research
 - b. Teaching
 - c. Hiking
 - d. Running
 - e. Biking
 - f. Bird watching
 - g. Taking photographs
 - h. Socializing
 - i. Other

6. Have you attended any organized UC Reserve Outings?
 - a. Yes
 - b. No

7. If you answered yes to question 6, please describe your outing here:

a. (Open-ended response, long answer)

8. Have you ever participated in the Natural History Hike along Cold Canyon's Homestead Trail? (following the brochure and numbered trail markers)

a. Yes

b. No

9. Have you ever volunteered your time at the reserve?

a. Yes

b. No

10. If you answered yes to question 9, please describe what you did and when you volunteered:

a. (Open-ended, long answer)

11. What is your favorite spot/area in the reserve and why do you like it?

a. (Open-ended, long answer)

12. There are many places along the existing trail that people care more about. What types of existing places would you like to see incorporated as part of the new/expanded trail system?

a. (Open-ended, long answer)

13. Is there something you would suggest to include at the reserve that would improve your time there (that isn't there already)?

a. (Open-ended, short answer)

14. How far do you travel to get to the reserve?

a. Less than 10 miles (includes Winters)

b. 10-30 miles (includes Davis, Vacaville, and Napa)

c. 30-60 miles (includes Woodland, Sacramento, and Santa Rosa)

d. More than 60 miles

15. Which parking area(s) do you usually use?

a. (Open-ended, short answer)

16. Do you usually carpool to the reserve with anyone outside of your family?

- a. Yes
- b. No

17. If you visit the reserve with others, who do you go with?

- a. Other professionals
- b. Friends
- c. Children
- d. Dogs
- e. Out-of-town visitors
- f. Other

18. If you bring dogs, do you stay on designated dog trails?

- a. Yes
- b. No
- c. I don't bring dogs

19. How far do you hike if you bring children?

- a. Stay on the lower Homestead Trail
- b. Go up the Blue Ridge along the stairs
- c. Go up the Blue Ridge along the switchbacks
- d. Travel the entire loop
- e. I don't bring children

20. Do you eat while at the reserve?

- a. Yes
- b. No

21. If so, where do you usually stop in the reserve to eat?

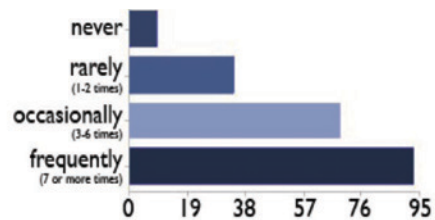
- a. (Open-ended, short answer)

22. Are there general comments or other concerns you have about the Stebbins Cold Canyon Reserve that you would like to share?

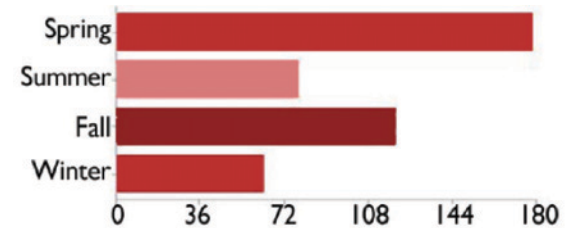
- a. (Open-ended, long answer)

Final Tabulated Survey Responses

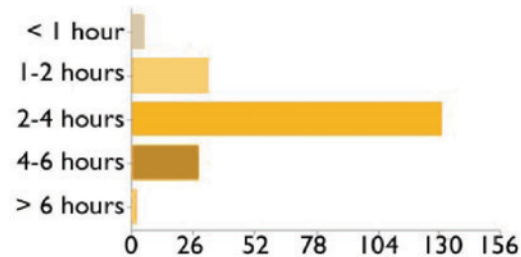
Question 1: *How many times have you visited the reserve?*



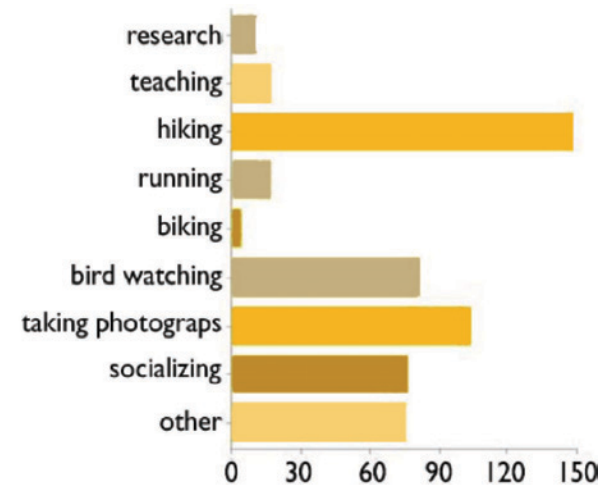
Question 3: *During what season(s) do you normally visit?*



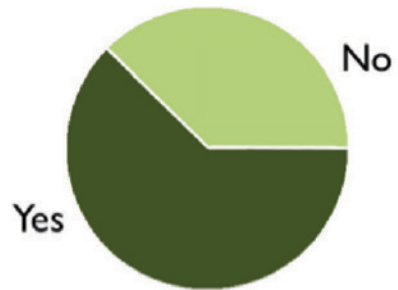
Question 2: *On average, how much time do you spend at the reserve?*



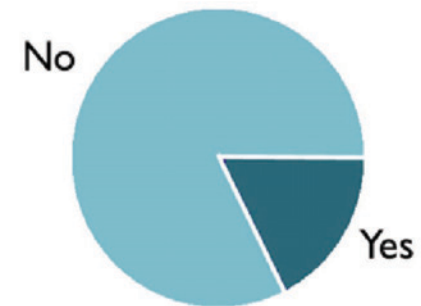
Question 5: *What other activities do you like to do at the reserve?*



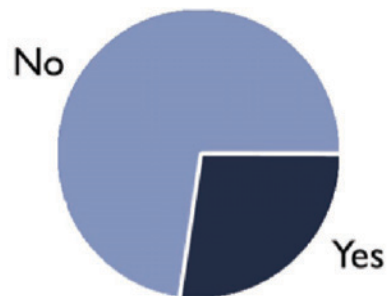
Question 6: *Have you attended any organized UC Reserve Outings?*



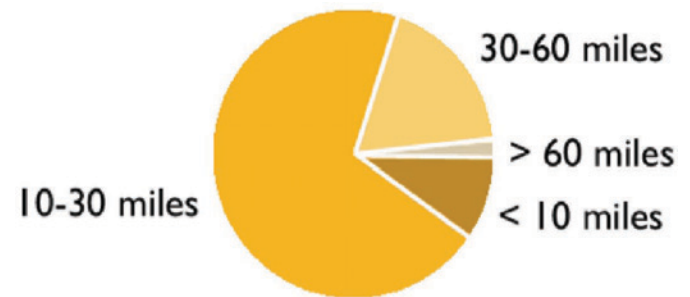
Question 9: *Have you ever volunteered your time at the reserve?*



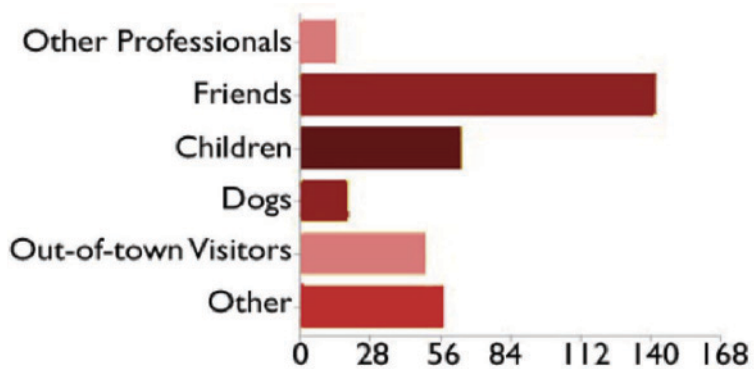
Question 8: *Have you ever participated in the Natural History Hike along Cold Canyon's Homestead Trail? (following the brochure and numbered trail markers)*



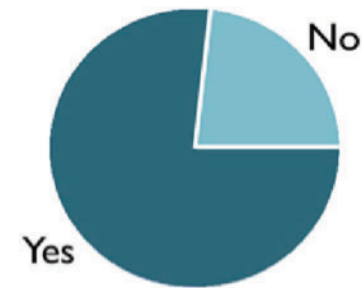
Question 14: *How far do you travel to get to the reserve?*



Question 17: *If you visit the reserve with others, who do you go with?*



Question 20: *Do you eat while at the reserve?*



Question 18: *If you bring dogs, do you stay on designated dog trails?*





THE END