CITY OF SAN LUIS OBISPO
2015 OPEN SPACE MAINTENANCE PLAN

TO PROTECT AND MAINTAIN OPEN SPACE

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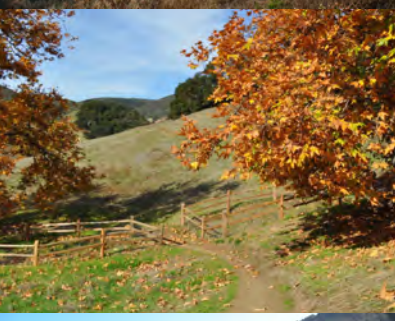
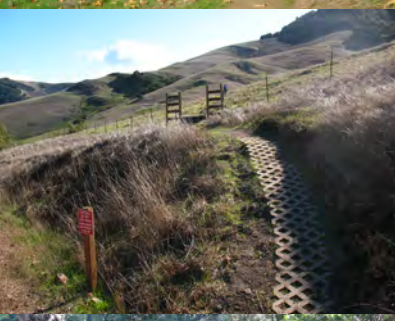
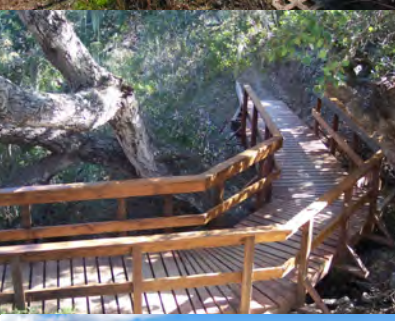




OPEN SPACE PRESERVATION

PROTECT AND MAINTAIN OPEN SPACE

With the adoption of the City's 2015-17 Financial Plan the City Council adopted a Major City Goal; Open Space Preservation: protect and maintain open space. In addition to being a foundational goal to be addressed during the City's current two-year Financial Plan, this important community objective was a key reason for residents' overwhelming adoption of Measure G in 2014. According to City Conducted resident surveys open space preservation is always a top priority community value.

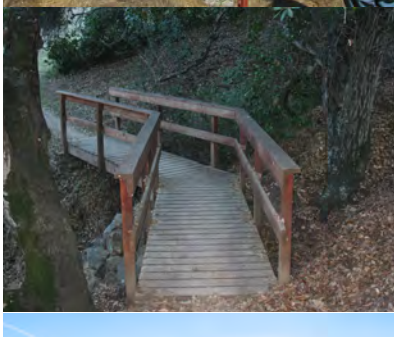
As of December, 2015, the City of San Luis Obispo owned approximately 3,700 acres of open space lands comprised of 15 major properties held in open space, natural reserve, or ecological reserve status. City staff oversee approximately 3,700 acres of land protected under open space or conservation easements with an established trail network of over 52 miles. City staff undertake open space maintenance, patrol, site stewardship, and environmental education through various programs and partnerships. The City's open space program is managed by an "Open Space Team" comprised of City Administration Natural Resources Program staff and Parks and Recreation Ranger Service staff.

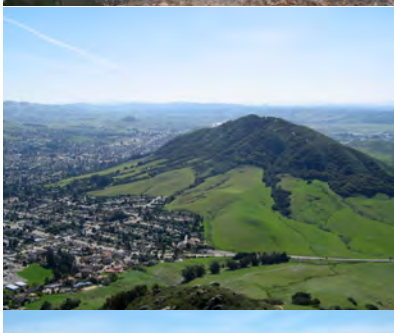
CONSISTENCY WITH POLICY DOCUMENTS GUIDING OPEN SPACE PRESERVATION

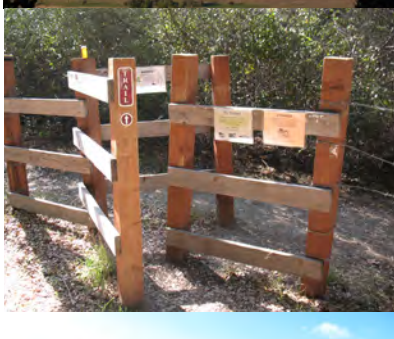
This is the City's first Open Space Maintenance Plan. It is premised on the protection of the City's natural resources including plants, animals, geologic and historic features, and the natural areas themselves. The Plan has been written in a manner that affirms the practice of open space maintenance conducted in the City by staff, contractors, and volunteers in accordance with the City's adopted Conservation and Land Use Element, Conservation Guidelines, ordinances and adopted Conservation Plans for each specific open space area. This Plan is intended to provide guidance for the City's maintenance practices and protocols in its open space consistent with existing policies.

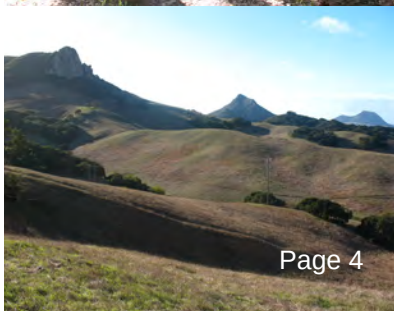
As articulated more specifically in this Plan, maintenance includes implementation of City Conservation Plans, as well as the following: enhancement and maintenance to existing trailheads and trails, maintenance and construction of approved and sustainable trails and open space facilities for passive recreation purposes only, removal of illicit materials and trails, improved user and natural resource safety, land restoration and stewardship projects, invasive species treatment and control, erosion control and stabilization, education of users via patrols and community outreach, and management of the wildland-urban interface areas.

The implementation items for the City's conservation plans are numerous and property specific. They include activities such as: trailhead, parking, and emergency access improvements; directional and educational trail signs and kiosks; trail installation, closures, re-routes, and erosion control; invasive species control, fire protection and native habitat restoration; and, bridge, fence, and open space infrastructure replacement. Such enhancements will result in substantive user safety and resource protection improvements.









OPEN SPACE MAINTENANCE PLAN OVERVIEW

This Plan is divided into three sections. Foundational information is provided and then applied to each open space area. The first section, Maintenance Activities, provides a listing of the maintenance activities undertaken in the City's various open space areas. Activities are described narratively. This is followed by Amenities, which includes an overview of the amenities located in open space areas with a specific description of each. The purpose, number of types, specifications, typical location, vendor, standard costs, installation, maintenance, and lifespan information is provided for each amenity. The last section of the Plan incorporates maintenance activities with amenities on illustrative maps for each open space area as well as provides highlights of priority maintenance and conservation projects.

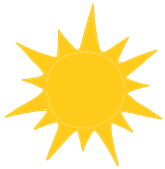
MAINTENANCE ACTIVITIES

In describing maintenance activities for this plan, staff has focused on activities which are undertaken by staff, contractors, and volunteers on a daily, weekly, monthly, and annual basis. Based on availability and economics some maintenance work may be performed by local contractors, California Men's Colony Crews, California Conservation Crews, Saturday and Wednesday Workday Volunteers, always supervised by Ranger Service staff. The City open space has pre-existing easement agreements with private and public easement holders. The City creates a best practice to work with the easement holders to perform necessary maintenance. Maintenance activities for the City's open space fall into six main categories: maintenance of vegetation, structures, signs, trail/road, drainage, and trail construction. Within each of these categories are focused activities that can occur seasonally or year round.

SEASONAL MAINTENANCE CODE

These symbols will appear throughout the open space location maintenance tables as reference to which season certain maintenance activities typically occur for that open space.

SPRING 

SUMMER 

FALL 

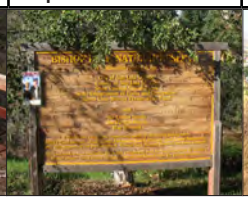
WINTER 

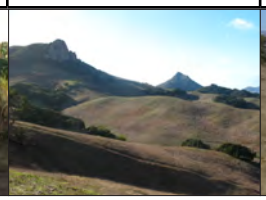
YEAR ROUND 

MAINTENANCE ACTIVITIES

Vegetation Maintenance	Structure Maintenance	Sign Maintenance	Trail/Road Maintenance	Drainage Maintenance	Trail Construction
Brushing / Clearing (Fuel Reduction / Trails)	Gate/Entry Repair	Sign design installation	Road & Parking Maintenance	Winterization Cleaning culverts drainage ditches	New Trails
Remove fallen trees/branches	Fence repair	Sign repair	Trail repair	Erosion control	Trail Maintenance
Slope revegetation, Seasonal mowing	Bridge repair	Sign replacement	Trimming	Install culverts and grade dips	Decommission
Invasive Species Control	Kiosks, Trail Amenities	Barricade Closure device repair	Remove loose rocks	Monitor/Repair drainage ditches	Reroute








VEGETATION MAINTENANCE

BRUSHING/CLEARING: TRAILS AND FUEL REDUCTION

The removal of unwanted vegetation in the active trail corridor, to keep trails clear and maintain the corridor. All maintenance is performed using hand tools such as hand pruners and chainsaws.

FUEL REDUCTION

Activities involve collaboration with the City Fire Department on all maintenance decisions which include: seasonal mowing, grazing, understory thinning (shaded fuel break), fuel break (clear transition), and prescribed burns. *See technical appendix: City of San Luis Obispo Vegetation Management Plan; The Wildland-Urban Interface.*

REMOVE FALLEN TREES/BRANCHES

Ranger Service staff will promptly remove fallen trees and branches from trails, roads or other accessible areas to clear trail corridor and alleviate potential hazards. All maintenance is performed using hand tools such as hand pruners and chainsaws.

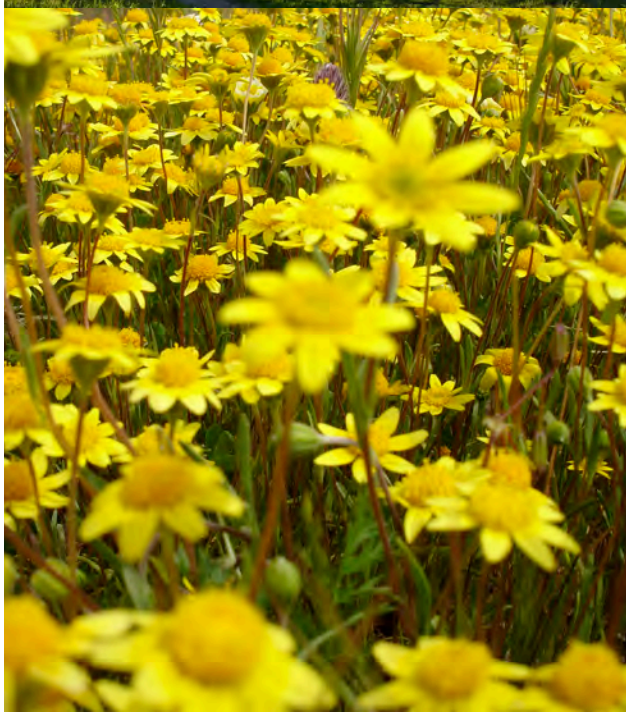
SLOPE REVEGETATION

The planting of native container stock, seeding of native species, and installation of erosion control measures and techniques where appropriate and feasible to prevent erosion on trail corridors. Tools include, native seed, bio log (straw waddle), erosion control jute netting, and silt fencing.

INVASIVE SPECIES CONTROL

Invasive species treatment shall occur based on the City's Integrated Vegetation Management Plan. This plan identifies and prioritizes invasive species and control techniques, and provides further details for open space lands using Integrated Pest Management (IPM) techniques. The City uses local certified Pest Control Advisors and Qualified Applicator Licensees. The completed maintenance activities are required to report to the State of California Department of Pesticide Regulation and the County Agriculture Commissioner's Office. Ranger Service staff also hand pull and cut invasive species on a regular basis. *See technical appendix: Integrated Vegetation Management Plan for Open Space Lands of the City of San Luis Obispo 2015-2020.*

Conservation Guidelines
http://www.slocity.org/home/showdocument?id=5911



STRUCTURE AND SIGN MAINTENANCE

OVERALL
Design of signs and structures is based upon the City Style Guide, and materials are used for longevity and vandalism resistance. Staff conducts repair and replacement on a prioritized life cycle basis, or when damage or vandalism occurs.

GATE / ENTRY REPAIR
Adjust the leveling of hinges for proper swing of gate. Routine maintenance includes oil of hinges, and the adjustment of screws.

FENCE REPAIR
Monitor the tensioning of the 5-strand barbed wire to prevent failure of the fencing. Replace posts due to weather damage and vandalism.

BRIDGE REPAIR
Small crossing bridges will have tread and surface repair on foot boards to prevent potential safety hazards. Replace boards due to weather damage and vandalism.

KIOSKS / TRAIL AMENITIES
Perform routine Kiosk maintenance including fresh paint, vandalism repair, and replacement of faded panels

CATTLE GUARDS
General maintenance of grip tape replacement, the removal of dirt inside the ramp box, and the complete replacement due to ramp deterioration.

SIGN POSTS
The repair or replacement of wood post or blade due to weather, livestock or vandalism damage.

SIGN REPAIR
The repair of the sign, reattach sign to fence, and replace missing screws. Remove stickers on the sign due to vandalism.

SIGN REPLACEMENT
Replace entire sign due to vandalism or sun fade.

BARRICADE/CLOSURE SIGNS
These signs are used for preventative maintenance for closure of trails. No maintenance required.

TRAIL / ROAD MAINTENANCE

ROAD AND PARKING MAINTENANCE

These roads are primarily a natural surface and periodic drainage and erosion maintenance must occur. As conditions warrant, maintenance will consist of limited surface replacement (base rock or seal).

TRAIL REPAIR

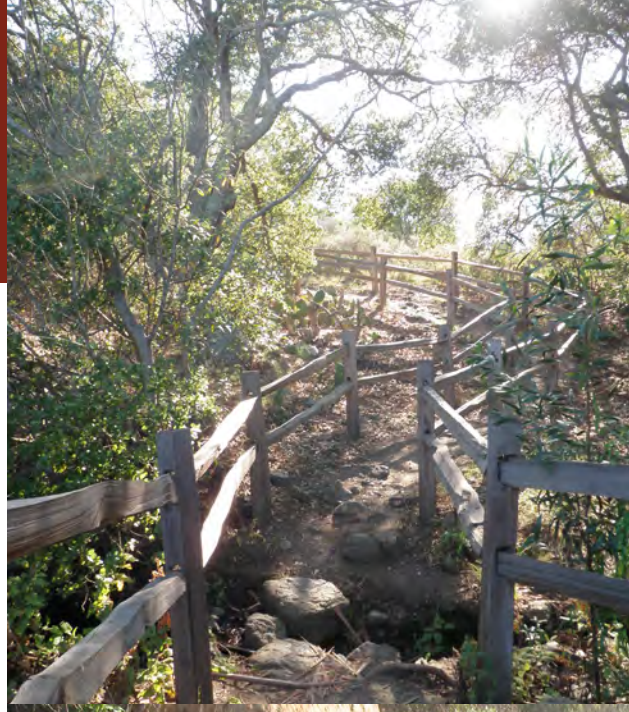
Efforts focus on modern, sustainable trail maintenance practices with particular focus on drainage and erosion. Maintenance activities could include the following: prevention of switchback cutting, stacking of rocks, placement of native vegetation, and barbed wire fencing.

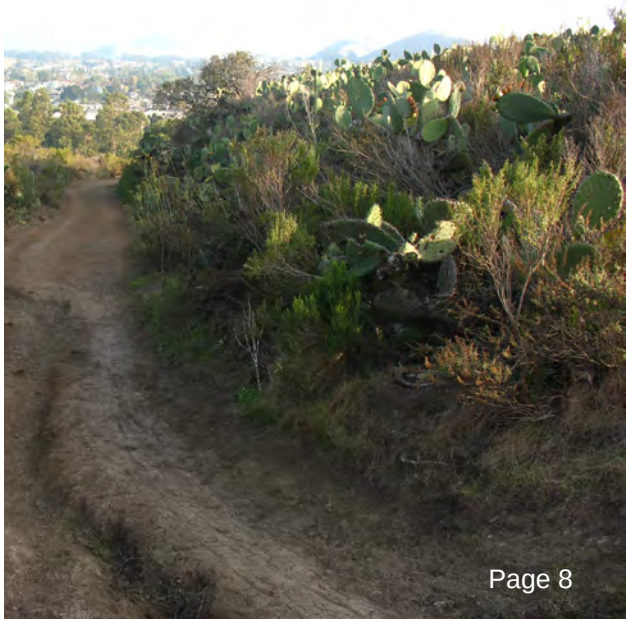
TRIMMING

The removal of unwanted vegetation in the active trail corridor, to keep trails clear and maintain the corridor. All maintenance is performed using hand tools such as hand pruners and chainsaws.

REMOVE LOOSE ROCKS

Remove hazardous rocks from trail corridor, to prevent potential safety issues on the trail.





DRAINAGE MAINTENANCE / WINTERIZATION

OVERALL

General maintenance and repair is performed primarily during the fall in preparation for seasonal winter storms.

CLEANING CULVERTS AND DRAINAGE FEATURES

To provide proper water movement the removal of debris at entry and exit of culverts and swales.

EROSION CONTROL

Implementation of replanting and reseeding of native materials or placement of biodegradable bio-logs to prevent erosion.

INSTALL CULVERTS AND ROLLING GRADE DIPS

To prevent water accumulation, monitor water drainage off the tread surface, and ensure the high point is maintained.

MONITOR/REPAIR DRAINAGE FEATURES

Removal of vegetation to increase water flow, and prevent water buildup on the trail corridor.

TRAIL CONSTRUCTION

OVERALL
New trail construction will follow prescriptive plans following consultation and collaboration with the Natural Resources Manager.

BRUSHING TRAIL CORRIDOR
Removal of unwanted vegetation in the active trail corridor, to keep trails clear and maintain the corridor. All maintenance is performed using hand tools such as hand pruners and chainsaws.

NEW TRAILS
Construction of new trails when an old trail is not sustainable or due to rerouting or decommission or the expansion of open space land.

REROUTE
Physically move or relocate a section of trail when existing trail is considered to be unsafe or not sustainable within the trail corridor.

DECOMMISSION
Create a physical barrier to decommission trail, boulder, new vegetation and reseeding, fencing, excess brush materials.

TRAILHEAD AMENITIES

BELL BOX

CATTLE GUARD

MUTT MITTS

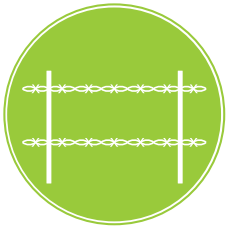
BENCHES

GATES

PARKING

BIKE RACKS (4)

KIOSK:LARGE

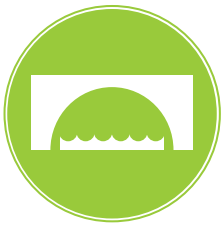


PASTURE/PERIMETER FENCING

BIKE RACKS (8)

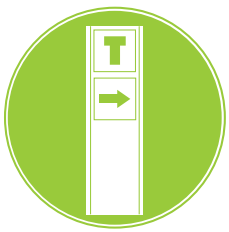
KIOSK: MEDIUM

TRAILHEAD FENCING



BRIDGE

KIOSK: SMALL



TRAIL SIGNAGE

A trailhead is the point at which a trail begins; where the trail is intended for passive recreation activities. The size of trailheads varies. For the purposes of standardization, the City will have three different sized trailheads (small, medium, and large) with differing degrees of enhancement at each. They are sized according to location, space available and appropriateness for improvements. The City has 24 active trailheads within the San Luis Obispo Open Space. Each amenity outlines the purpose, design specification, location, standard costs, materials, installation, maintenance and lifespan.

AMENITY COSTS

AMENITY	STANDARD COST	INSTALLATION COST	TOTAL
Bell Box	$100	$24	$124
Benches	$750	$100	$850
Bike Racks - 4 Bike	$440	$48	$488
Bike Racks - 8 Bike	$880	$48	$928
Cattle Guards	$700	$385	$1,085
Gates - Accessible	$150	$125	$275
Gates - Swing	$300	$195	$495
Gates - Vehicle	$1,000	$435	$1,435
Kiosk - Large	$12,000	$575	$12,575
Kiosk - Medium	$10,000	$575	$10,575
Kiosk - Small	$5,000	$385	$5,385
Mutt-Mitts/Trash Cans	$536	$100	$636
Trail Signage - Blade	$75	$24	$99
Trail Signage - Rules	$150	$48	$198
Trail Signage - Maps “You Are Here”	$2,000	$195	$2,195

AMENITY	STANDARD COST	INSTALLATION COST
Trailhead Fencing	$30 per linear foot	$285 - $865
Perimeter Fencing	$15 per linear foot	$285 - $865
Bridges	$100 - $2,000 Range	$650 - $5,500
Parking	Materials Cost per yard/Rentals $250	$435-$865

BELL BOX

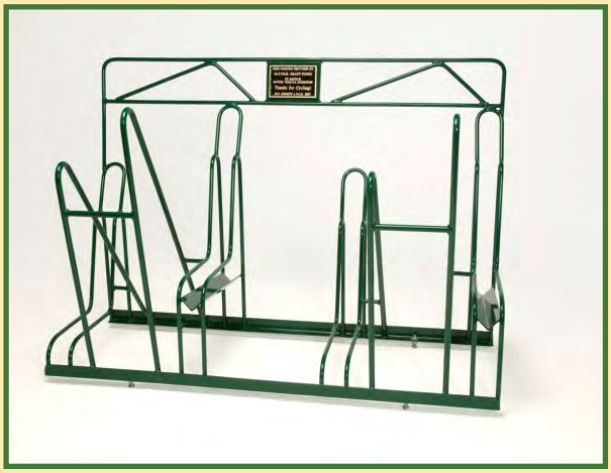
Purpose	Provide open space bicycle users a bell for safety while riding on the trail
Number of Types	1
Specifications	Metal box
Typical Location	Large & medium multi-use trailheads – attached to Kiosk (front panel)
Vendor	Ranger Service
Standard Costs	$100
Standard Materials List	Bolts, drill for attachment to Kiosk
Who Installs	Ranger Service
How Installed	Attach metal box to front panel of Kiosk – drill, screws
Number of Hours to Install	30 minutes
Cost of Installation	$24
Annual Maintenance	Stock box with bells and vandalism repair as needed
Average Lifespan	20 years

BENCHES

Purpose	Provide open space users a place to sit at a scenic vista
Number of Types	1
Specifications	Standard prefabricated – 6 foot composite
Typical Location	Large trailheads – proximate location to Kiosk
Vendor	Wakefield Company (shown)
Standard Costs	$750
Standard Materials List	Bolts, 5-6 bags of concrete
Who Installs	Ranger Service
How Installed	Pour concrete for footing, install bench bolted to ground
Number of Hours to Install	2 - 5 hours
Cost of Installation	$48 - $120
Annual Maintenance	Typically vegetation clearing around the bench and some vandalism repair as needed. The amenity itself is durable, and mounted in concrete so needs minimal maintenance
Average Lifespan	10 - 20 years

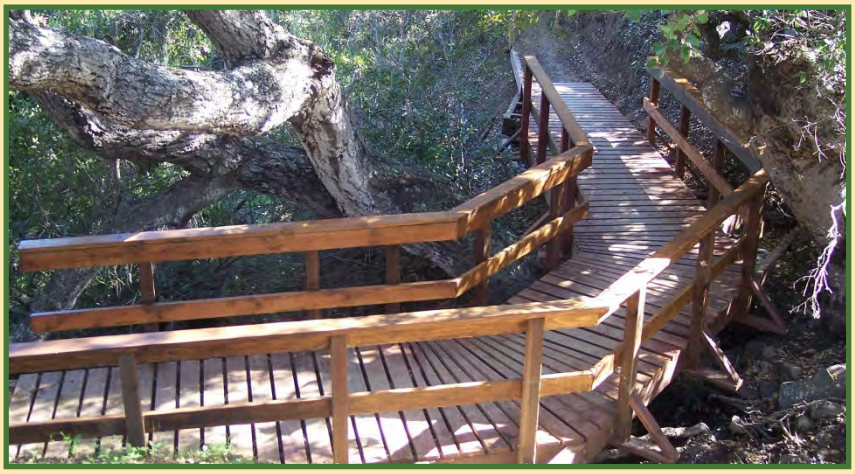
BIKE RACKS

Purpose	Provide bike parking at trailheads to promote biking to open space
Number of Types	1
Specifications	Green metal, angled, pre-manufactured
Typical Location	Large and Medium Trailheads 8 bike capacity at Large Trailheads; 4 bike capacity at Medium Trailheads
Vendor	Peak Racks (shown)
Standard Costs	$880 for 8 bike $440 for 4 bike
Standard Materials List	Concrete, bolts, drill
Who Installs	Ranger Service
How Installed	Build form, pour concrete base, bolted to ground
Number of Hours to Install	2 - 5 hours per rack
Cost of Installation	$48 - $120 Ranger Service Peak Racks installation fee waived with rack purchase
Annual Maintenance	Typically vegetation clearing around the rack and some vandalism repair as needed. The amenity is metal, durable, and mounted on concrete so needs minimal maintenance
Average Lifespan	50 years



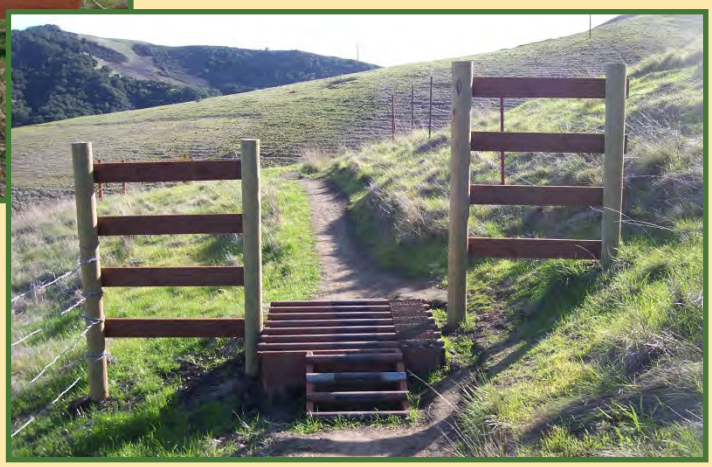
BRIDGES

Purpose	Provide the open space user safe access on trails, while protecting creek areas
Number of Types	Custom per open space location
Specifications	Design site specific
Typical Location	Various open space locations
Vendor	Ranger Service
Standard Costs	$100 - $2,000
Standard Materials List	Pressure treated wood, threaded bolts, screws, concrete, metal, turf pavers, braces, metal
Who Installs	Ranger Service
How Installed	Custom per site
Number of Hours to Install	1 day – 2 weeks
Cost of Installation	$650 - $5500
Annual Maintenance	Typically vegetation clearing and some vandalism repair as needed. The amenity itself is wood, durable, and mounted on concrete and bracing so needs minimal maintenance.
Average Lifespan	15 - 30 years



CATTLE GUARDS

Purpose	Provide boundaries for the cattle grazing in the open space. Provide safety for the open space user at the trailhead and along the trail.
Number of Types	1
Specifications	Raised box ramp with 2 inch piping and walking surface with expanded metal and corrugated metal bottom – box made from pressure treated wood
Typical Location	Open Space locations with grazing management
Vendor	Ranger Service
Standard Costs	$500 - $700
Standard Materials List	2 X 12 pressure treated, 4 foot square 7 pieces, 2” X 4 foot schedule 40 pipe deck 8 pieces, 2” X 2 foot schedule 40 ramp(s) 2 pieces corrugated metal weed block Grip tape, screws, glue, turf paver
Who Installs	Ranger Service
How Installed	Auger, rock bar, screws, drills, fence tools, metal chop saw, dirt level tools
Number of Hours to Install	6 - 8 hours
Cost of Installation	$285 - $385
Annual Maintenance	Typically vegetation clearing around the posts and some vandalism repair as needed. Replacement of boards or rotten posts.
Average Lifespan	10 - 15 years



GATES

Purpose	Provide boundaries for the open space user at the entrance of the trailhead
Number of Types	4 main types at Entry, Driveway and Accessible access points
Specifications	**Bollards:** At trailhead entry; removable bollard with sleeve **Powder River Swing Gate:** At trailhead entry; powder river green metal; spring loaded **Powder River Drive Metal Gate:** Vehicle driveway entrance; powder river green metal; size dependent on location **Wheel Device Accessible Gate:** Wheelchair/stroller accessible at trailhead entry; 48” minimum; pressure treated wood on hinges with combination lock
Typical Location	Entry to an open space area, a trailhead, a driveway and accessible entries
Vendor	Various
Standard Costs	$150 - $1000
Standard Materials List	Concrete, pressure treated wood, screws, bolts, angled metal, leveler
Who Installs	Ranger Service or Contractor
How Installed	Auger, cement, post hole digger, rock bars, drills, drivers, socket, box wrench, level, shovel, wheel barrel, water
Number of Hours to Install	2 hours – 1 day
Cost of Installation	$100 - $435
Annual Maintenance	Typically vegetation clearing around the gates and some vandalism repair as needed. The amenities are typically metal and durable, so needs minimal maintenance. Replacement of boards or rotten posts for accessible gate.
Average Lifespan	15 - 35 years

KIOSK: LARGE

Purpose	Provide open space users with information and safe passage in the City's open space; Educate and inform users about Open Space location and species of concern; provide open space regulations
Number of Types	1
Specifications	6 Panel; Standard design with front and back panels, per plan specs **Masthead:** Open Space formal name **Front Panel Center:** Trail specific map for location (level of difficulty) **Front Panel Upper Right:** Rules/Regulations and Citations/Fines **Front Panel Lower Right:** Corkboard for announcements and messages **Front Panel Lower Right:** Bell box, hooks for lost and found **Front Panel Left:** Educational for property specific **Back Panel Center:** City Open Space Map **Back Panel Left and Right:** Rotating panels educational
Typical Location	Primary entry to an open space area, a trailhead
Vendor	Ranger Service, Graphic Designer, Contractor
Standard Costs	$12,000
Standard Materials List	Concrete, pressure treated posts, bolts, hardware, plywood, screws, tar paper, edging(flashing), roofing materials , tongue & groove wood
Who Installs	Ranger Service, Contractor
How Installed	Auger, shovel, post hole digger, drill driver, hammer, chop, skill and/or table saw, X-Acto knife
Number of Hours to Install	8 - 12 hours
Cost of Installation	$385 - $575
Annual Maintenance	Typically vegetation clearing around the kiosk and some vandalism repair as needed. The amenity itself is durable, and mounted on concrete so needs minimal maintenance. Panels are subject to replacement under warranty for 10 years at no charge.
Average Lifespan	20 - 25 years

KIOSK: MEDIUM

Purpose	Provide open space users with information and safe passage in the City's open space; Educate and inform users about Open Space location and species of concern; provide open space regulations
Number of Types	1
Specifications	3 Panel; Standard design with front panels, per plan specs **Masthead:** Open Space formal name **Front Panel Center:** Trail specific map for location (level of difficulty) **Front Panel Upper Right:** Rules/Regulations and Citations/Fines **Front Panel Lower Right:** Corkboard for announcements and messages **Front Panel Lower Right:** Bell box, hooks for lost and found **Front Panel Left:** Educational for property specific
Typical Location	Primary entry to an open space area, a trailhead
Vendor	Ranger Service, Graphic Designer, Contractor
Standard Costs	$10,000
Standard Materials List	Concrete, pressure treated posts, bolts, hardware, plywood, screws, tar paper, edging(flashing), roofing materials , tongue & groove wood
Who Installs	Ranger Service, Contractor
How Installed	Auger, shovel, post hole digger, drill driver, hammer, chop, skill and/or table saw, X-Acto knife
Number of Hours to Install	8 - 12 hours
Cost of Installation	$385 - $575
Annual Maintenance	Typically vegetation clearing around the kiosk and some vandalism repair as needed. The amenity itself is durable, and mounted on concrete so needs minimal maintenance. Panels are subject to replacement under warranty for 10 years at no charge.
Average Lifespan	20 - 25 years

KIOSK: SMALL

Purpose	Provide open space users with information and safe passage in the City's open space; provide open space regulations
Number of Types	1
Specifications	1 Panel; Standard design with front panel, per plan specs **Masthead:** Open Space formal name **Front Panel Center:** Trail specific map for location (level of difficulty). Rules/Regulations and Citations/Fines
Typical Location	Primary entry to an open space area, a trailhead
Vendor	Ranger Service, Graphic Designer, Contractor
Standard Costs	$5,000
Standard Materials List	Concrete, pressure treated posts, bolts, hardware, plywood, screws, tar paper, edging(flashing), roofing materials , tongue & groove wood
Who Installs	Ranger Service, Contractor
How Installed	Auger, shovel, post hole digger, drill driver, hammer, chop, skill and/or table saw, X-Acto knife
Number of Hours to Install	6 - 8 hours
Cost of Installation	$285 - $385
Annual Maintenance	Typically vegetation clearing around the kiosk and some vandalism repair as needed. The amenity itself is durable, and mounted on concrete so needs minimal maintenance. Panels are subject to replacement under warranty for 10 years at no charge.
Average Lifespan	20 - 25 years

TRASH CANS & MUTT-MITTS

Purpose	Provide open space users with trash cans and mutt-mitts for disposal and clean up before and after the hiking experience
Number of Types	1
Specifications	8' Post, Trash Can & Mutt-Mitt Standard green metal 15 gallon trash can with top cover Mutt-Mitt: Standard green metal bag dispenser
Typical Location	Entry to an open space area with a large or medium kiosk, a trailhead. Proximate location to the kiosk – placed next to each other
Vendor	Kirby Built (shown)
Standard Costs	$512 each $436 (order of 6 or more)
Standard Materials List	Post hole digger, shovel, hardware, drill
Who Installs	Ranger Service
How Installed	Prepare hole, install pole/trash can/mutt-mitt
Number of Hours to Install	2 - 5 hours
Cost of Installation	$48 - $120
Annual Maintenance	Typically vegetation clearing around the trash can and mutt-mitt and some vandalism repair as needed. The amenity is metal, durable, and mounted on concrete so needs minimal maintenance. Trash pick-up occurs twice weekly by Public Works with the exception of Johnson Ranch and Reservoir Canyon.
Average Lifespan	10 - 20 years

PARKING

Purpose	Provide open space users a safe place to park vehicles.
Number of Types	Various
Specifications	Decomposed granite or base rock, natural material for parking stop, boulders to preserve fencing
Typical Location	Large trailheads (Cerro San Luis, Prefumo Canyon, Reservoir Canyon)
Vendor	Various Material Suppliers
Standard Costs	Materials cost per yard; Rental fee of $250/day
Standard Materials List	Decomposed granite or base rock, boulders – delivery of base Equipment rental
Who Installs	Ranger Service
How Installed	Level base with equipment
Number of Hours to Install	1 - 2 days
Cost of Installation	$435 - $865
Annual Maintenance	Smoothing out ruts and potholes, clearing drains for winterization.
Average Lifespan	5 - 7 years

PERIMETER & PASTURE FENCING

Purpose	Provide boundaries for the property line and/or livestock.
Number of Types	1
Specifications	Four or five strand barbwire fencing for cattle or perimeter with metal support bracing, barbless on top and bottom
Typical Location	Various open space locations
Vendor	Various Suppliers
Standard Costs	$12 - $15 per linear foot
Standard Materials List	T-posts, clips, barbed wire, round pipe, braces
Who Installs	Ranger Service or Contractor
How Installed	Fence tool, t-post pounder, come-along, wire tensioner, auger, post hole digger, welder
Number of Hours to Install	6 hours – 2 days, depending on size
Cost of Installation	$285 - $865
Annual Maintenance	Vandalism repair as needed, replacement of sections; Tensioning where needed
Average Lifespan	5 - 15 years

TRAILHEAD FENCING

Purpose	Provide boundaries for the open space user at the trailhead and along the trail
Number of Types	1
Specifications	Brown pressure treated wood fencing, post and rail; galvanized bolts
Typical Location	All open space locations
Vendor	Local lumber yards
Standard Costs	$20 - $30 per linear foot
Standard Materials List	Wood fencing, hardware (galvanized bolts)
Who Installs	Ranger Service or Contractor
How Installed	Auger, shovel, post hole digger, rock bar, drill and driver
Number of Hours to Install	6 hours – 2 days, depending on size
Cost of Installation	$285 - $865
Annual Maintenance	Typically vegetation clearing around the fence posts and some vandalism repair as needed. Replacement of boards or rotten posts.
Average Lifespan	15 - 25 years

TRAIL SIGNAGE

Purpose	Provide open space users with information on Open Space Regulations, Education/Interpretive, Maps and Directional Signage
Number of Types	4 main types: entry signs, user rules, maps, markers & trail junctions
Specifications	**Regulations:** Brown metal, style guide consistent, new City Open Space emblem, posted on bridges, fencing, posts **Education/Interpretive:** Identification of species/habitat and/or species present **Map Signs:** Single panel, "You Are Here" map **Markers & Trail Junctions:** Directional Signs / Blade Signs – plastic resin blade – stickers indicating trail name, level of difficulty, locater arrow
Typical Location	Entry to an open space area, a trailhead, along the trail and major trail junctions
Vendor	Graphic Designers, Sign Printers
Standard Costs	$75 - $2,000 (dependent on size/material)
Standard Materials List	Drill, bolts, post hole digger, pressure treated post
Who Installs	Ranger Service
How Installed	Attach to existing infrastructure when possible
Number of Hours to Install	30 minutes to 4 hours
Cost of Installation	$24 - $195
Annual Maintenance	Typically vegetation clearing around the sign and some vandalism repair as needed. The metal signs are durable, and need minimal maintenance. The blade signs require sticker replacement due to fading.
Average Lifespan	10 - 25 years

OPEN SPACE LOCATIONS

BISHOP PEAK NATURAL RESERVE

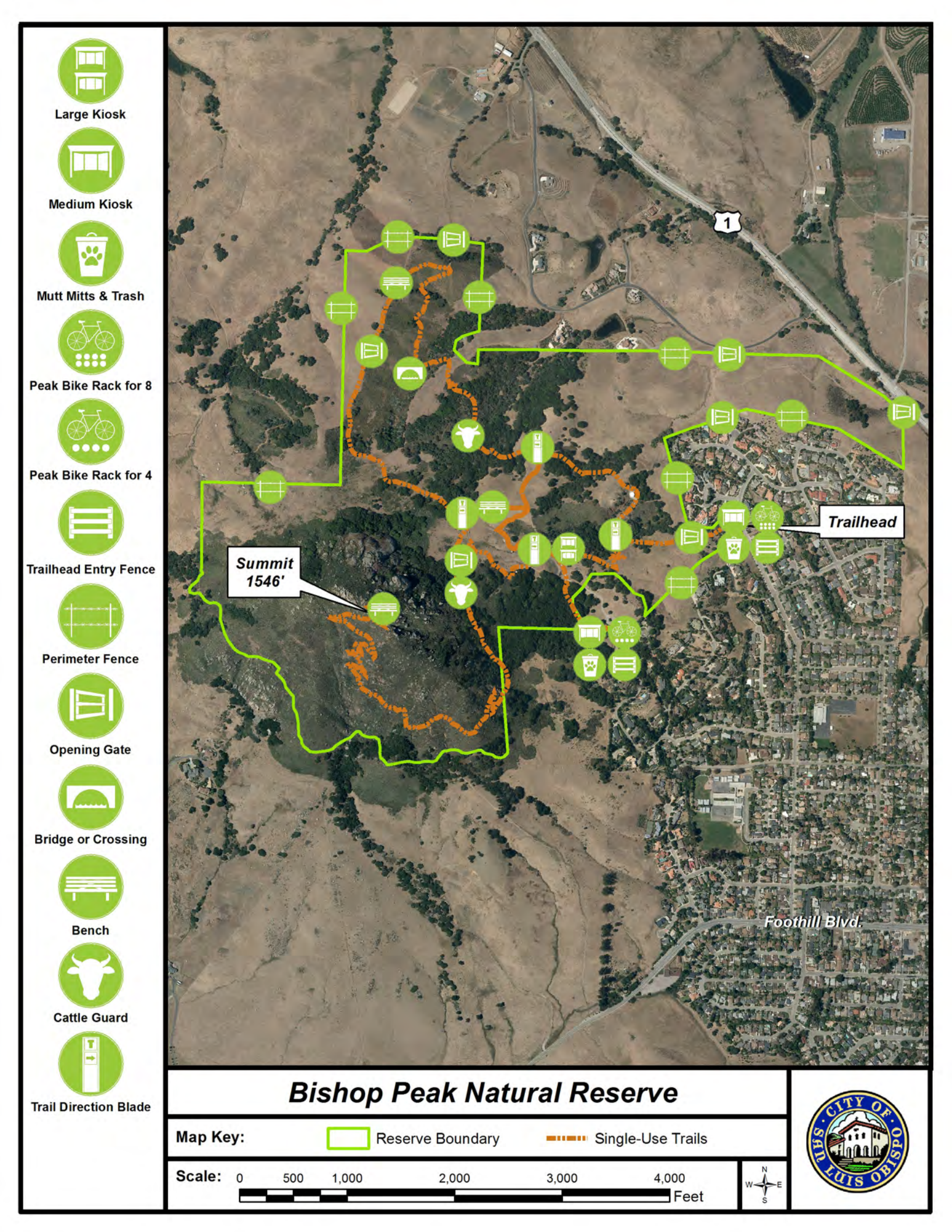
Bishop Peak Natural Reserve is a 352-acre open space located in the northwest portion of the City of San Luis Obispo. The three-pointed summit is the tallest and most distinctive of the peaks that make up the string of Morros known locally as the Nine Sisters. The Reserve is an important element of the local community's setting and character. Common vegetation types on Bishop Peak include oak woodland, coastal sage scrub and chaparral. The most prominent tree species on the mountain are Coast Live Oak and California Bay Laurel. Bishop Peak is an important local landmark that provides opportunities for enjoyment of the natural environment.

Bishop Peak Conservation Plan

http://www.slocity.org/home/showdocument?id=1918

MAINTENANCE ACTIVITIES					
Vegetation Maintenance	**Structure Maintenance**	**Sign Maintenance**	**Trail/Road Maintenance**	**Drainage Maintenance**	**Trail Construction**
Brushing / Clearing (Fuel reduction / Trails) Y	Gate/Entry repair Y	Sign design installation Y	Road & Parking Maintenance Y	Winterization/Cleaning culverts drainage ditches N/A	New Trails N/A
Remove fallen trees/branches Y	Fence repair Y	Sign repair Y	Trail repair Y	Erosion control ❄	Trail Maintenance Y
Slope revegetation Seasonal Mowing ✿	Bridge repair N/A	Sign replacement Y	Trimming ✿	Install culverts and grade dips ❄	Decommission Y
Invasive Species Control Y	Kiosks,Trail Amenities Y	Barricade Closure device repair ❄	Remove loose rocks Y	Monitor/Repair drainage ditches ❄	Reroute ✸ ❄

Trails	Land Use Designation	Notable Maintenance Projects
<u>Bishop Peak</u> Difficulty: Strenuous Elevation: 1,559 feet Distance: 4 miles round trip Estimated Time: 2 hours <u>Felsmen Loop</u> Difficulty: Moderate Elevation: 875 feet Distance: 2.5 miles round trip Estimated Time: 1 hour Total Area: 352 acres	Habitat: 216.8 acres Management / Grazing / Trail Corridor: 111.8 acres Restoration: 23.4 acres Total: 352 acres	1. Install signs / kiosks / trash and mutt mitts 2. Address trail erosion, trail braiding, and trail switchback cutting 3. Lower pasture riparian fencing 4. Stock pond excavation and habitat enhancement 5. Invasive species control 6. Wildland-Urban Interface fuel reduction


Large Kiosk
Medium Kiosk
Mutt Mitts & Trash
Peak Bike Rack for 8
Peak Bike Rack for 4
Trailhead Entry Fence
Perimeter Fence
Opening Gate
Bridge or Crossing
Bench
Cattle Guard
Trail Direction Blade
1
Trailhead
Summit
1546'
Foothill Blvd.
Bishop Peak Natural Reserve
Map Key:
Reserve Boundary
Single-Use Trails
Scale:
0
500
1,000
2,000
3,000
4,000
Feet
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CITY OF SAN LUIS OBISPO

BOB JONES BIKE TRAIL AND WETLAND

Segment 3 of the Bob Jones Bike Trail (BJBT) was constructed in 2006 along the top of San Luis Obispo Creek bank and adjacent to the City's Water Resource Recovery Facility (WRRF). The trail was constructed on City property, is approximately 1-mile long, features an engineered wetland and 2 bridges were installed to make this path begin and end at signalized intersections for added pedestrian and bike safety. The engineered wetland was installed in 2009 with grant funds from the Environmental Enhancement and Mitigation Program administered through Caltrans and was designed to treat stormwater runoff. One entrance to the trail is located at the intersection of Prado Road and Higuera with a bridge over San Luis Obispo Creek that was installed in 2011 and the bridge over Prefumo Creek was installed in 2014. There is a 3-panel kiosk at this entrance/exit from Los Osos Valley Road. With the installation of the bridge over Prefumo Creek, this trail became a new major thoroughfare getting to downtown. As the northern part of the trail passes next to the riparian corridor, some vegetation maintenance is required and then as the trail moves south, the lower WRRF fields are also maintained/ mowed through a Natural Resources/Utilities partnership.

MAINTENANCE ACTIVITIES

Vegetation Maintenance	Structure Maintenance	Sign Maintenance	Trail/Road Maintenance	Drainage Maintenance	Trail Construction
Brushing / Clearing (Fuel reduction / Trails) Y	Gate/Entry repair Y	Sign design installation Y	Road & Parking Maintenance N/A	Winterization/Cleaning culverts drainage ditches N/A	New Trails N/A
Remove fallen trees/branches Y	Fence repair Y	Sign repair Y	Trail repair Y	Erosion control ❄	Trail Maintenance N/A
Slope revegetation Seasonal Mowing ✿	Bridge repair N/A	Sign replacement Y	Trimming ✿	Install culverts and grade dips N/A	Decommission N/A
Invasive Species Control Y	Kiosks,Trail Amenities Y	Barricade Closure device repair ❄	Remove loose rocks N/A	Monitor/Repair drainage ditches ❄	Reroute N/A

Trails	Land Use Designation	Notable Maintenance Projects
Bob Jones Bike Trail Difficulty: Easy Elevation: level Distance: 2 miles round trip Estimated Time: 1 hours Total Area: 36.4 acres	Habitat:18 acres Management / Trail Corridor: 18.4 acres Total: 36.4 acres	1. Install signs / kiosks / trash and mutt mitts 2. City maintenance of San Luis Obispo Creek for habitat protection and flood control 3. City maintenance of Bob Jones Bike Trail, Segment 3 through the site 4. City patrol and enforcement of San Luis Obispo Municipal Code 12.23 "Creeks, Tributaries, and Riparian Corridor Regulations" due to persistent transient use and occupation of San Luis Obispo Creek area on site and nearby 5. Coordinate annual mowing of grassland areas with Utilities Dept. 6. Maintenance and upkeep of constructed wetland area

Medium Kiosk

Mutt Mitts & Trash

Bridge or Crossing

Perimeter Fence

Opening Gate

Notes:

1. This segment of the Bob Jones Bike Trail is part of the City's Water Resource Recovery Facility, (WRRF) and is also maintained by Utilties and Public Works.

Bob Jones Bike Trail and Wetland

Map Key: Bob Jones Bike Trail, Segment 3 — Class I Bike Trail

Scale: 0 1,250 2,500 Feet

N W E S

CITY OF SAN LUIS OBISPO

CALLE JOAQUIN AGRICULTURAL RESERVE / CITY FARM

The Calle Joaquin Agriculture Reserve (CJAR) also known as the SLO City Farm was acquired through protective policy to ensure that prime farmland is protected in the City when development is proposed. The SLO City Farm is a total of 25 acres owned by the City but was received in two pieces; a 2006 development contributed 13 acres and a development in 2010 contributed the remaining 12 acres. The site is located adjacent to Prefumo Creek and is overseen by a non-profit organization for day-to-day farm operations and maintenance. There is a bike path and bridge proposed for the property but these features are not currently installed. Since the site does contain a portion of lower Prefumo Creek, there is seasonal maintenance that occurs there. Winterization efforts to remove dead and downed debris and branches from the creek occur on an annual basis. This element is important to prevent flooding on the south side of the creek. All other structures and features of the site are the responsibility of the non-profit organization.

MAINTENANCE ACTIVITIES

Vegetation Maintenance	Structure Maintenance	Sign Maintenance	Trail/Road Maintenance	Drainage Maintenance	Trail Construction
Brushing / Clearing (Fuel reduction / Trails)	Gate/Entry repair **Y**	Sign design installation **N/A**	Road & Parking Maintenance **N/A**	Winterization/Cleaning culverts drainage ditches **N/A**	New Trails **N/A**
Remove fallen trees/branches **N/A**	Fence repair **Y**	Sign repair **Y**	Trail repair **N/A**	Erosion control **N/A**	Trail Maintenance **N/A**
Slope revegetation Seasonal Mowing **N/A**	Bridge repair **N/A**	Sign replacement **Y**	Trimming **N/A**	Install culverts and grade dips **N/A**	Decommission **N/A**
Invasive Species Control **N/A**	Kiosks,Trail Amenities **N/A**	Barricade Closure device repair **N/A**	Remove loose rocks **N/A**	Monitor/Repair drainage ditches **N/A**	Reroute **N/A**

Trails	Land Use Designation	Notable Maintenance Projects
There are no hiking or walking trails on this property.	Agricultural Area: 17 acres Management / Trail Corridor / Access Roads: 2 acres Restoration (riparian / wetland / bioswale areas): 6 acres Total: 25 acres	1. Primary maintenance and site control by Central Coast Grown under 20 year lease agreement 2. City maintenance of Prefumo Creek for habitat protection and flood control, and monitoring and upkeep of enhanced riparian, wetland, and bioswale features 3. City maintenance of future Bob Jones Bike Trail extension through the site 4. City patrol and enforcement of San Luis Obispo Municipal Code 12.23 “Creeks, Tributaries, and Riparian Corridor Regulations” due to persistent transients use and occupation of Prefumo Creek area on site and nearby

Small Kiosk

Mutt Mitts & Trash

Bridge or Crossing

Perimeter Fence

Opening Gate

Peak Bike Rack for 8

Notes:

1. Cultivated Crop Area and Water Well / Pump Area are maintained by Central Coast Grown (CCG) under 20 year Lease Agreement.

2. Table and bench seating area behind Costco is maintained by Irish Hills Plaza East under Conditions of Approval for Parcel Map 74/1-7.

Calle Joaquin Agricultural Reserve / City Farm

Map Key:

- Reserve Boundary
- Cultivated Crop Area
- Wetland / Riparian / Bioswale Plantings
- Future Class I Bike Trail

Scale: 0 — 500 — 1,000 Feet

N W E S

CITY OF SAN LUIS OBISPO

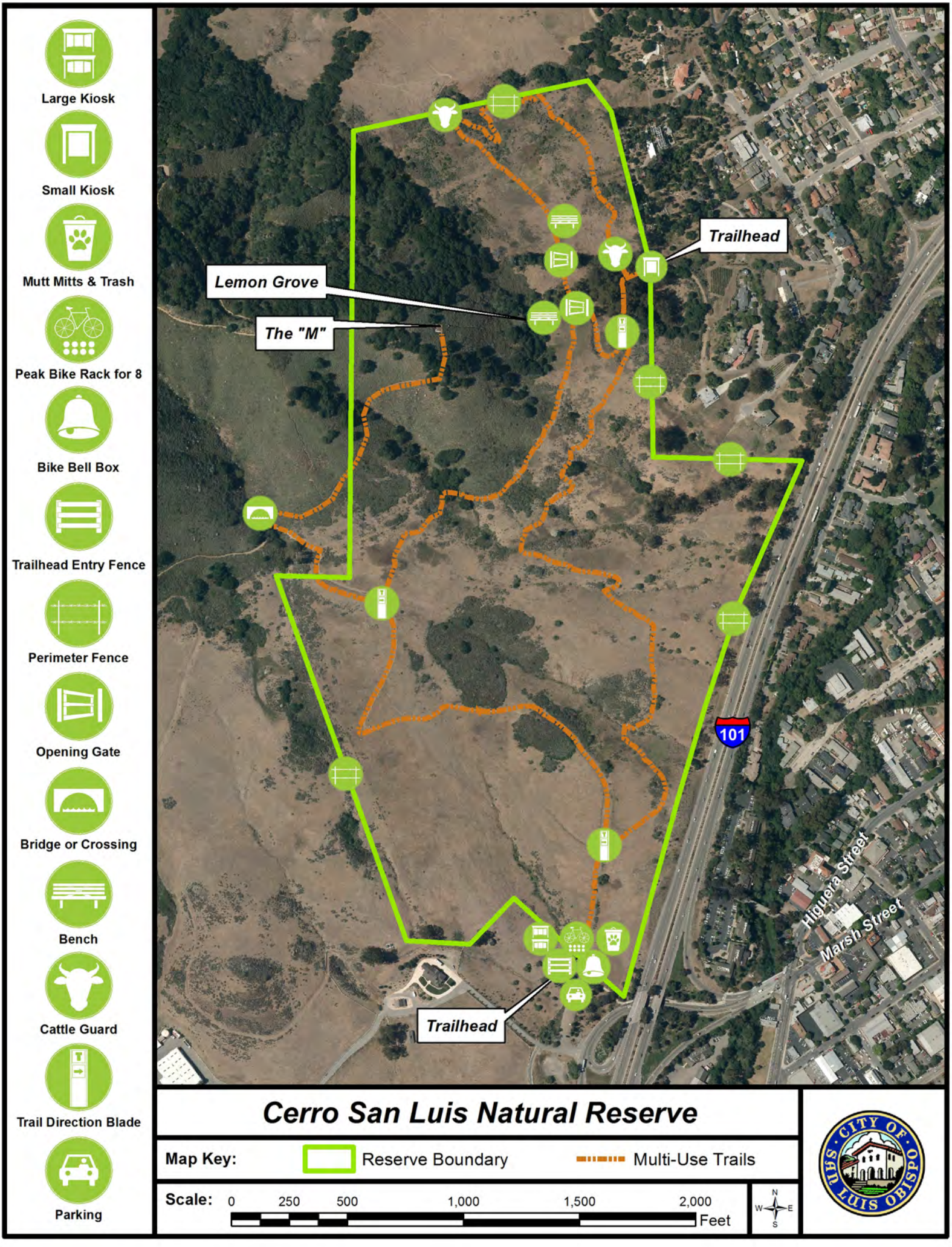
CERRO SAN LUIS NATURAL RESERVE

Cerro San Luis Natural Reserve is a 118 acre area located within the City of San Luis Obispo adjacent to U. S. Highway 101. Cerro San Luis is one of the nine named volcanic peaks, or morros. The peak looms prominently over the City of San Luis Obispo and is a central feature of the City's viewshed. The Reserve consists of several habitat types, including grassland, coastal scrub, oak woodland, and several occurrences of exotic plants such as eucalyptus, cypress, pepper tree, and Mission cactus. The terrain ranges from gently sloping to quite steep.

Cerro San Luis Conservation Plan
http://www.slocity.org/home/showdocument?id=1920

MAINTENANCE ACTIVITIES					
Vegetation Maintenance	**Structure Maintenance**	**Sign Maintenance**	**Trail/Road Maintenance**	**Drainage Maintenance**	**Trail Construction**
Brushing / Clearing (Fuel reduction / Trails)	Gate/Entry repair Y	Sign design installation Y	Road & Parking Maintenance Y	Winterization/Cleaning culverts drainage ditches	New Trails N/A
Remove fallen trees/branches Y	Fence repair Y	Sign repair Y	Trail repair Y	Erosion control	Trail Maintenance Y
Slope revegetation Seasonal Mowing N/A	Bridge repair Y	Sign replacement Y	Trimming Y	Install culverts and grade dips Y	Decommission Y
Invasive Species Control Y	Kiosks,Trail Amenities Y	Barricade Closure device repair	Remove loose rocks Y	Monitor/Repair drainage ditches	Reroute N/A

Trails	Land Use Designation	Notable Maintenance Projects
<u>Lemon Grove Loop</u> Difficulty: Moderate Peak Elevation: 500 feet Distance: +/- 2 miles round trip Estimated Time: 1.0 hour <u>"M" Trail</u> Difficulty: Moderate - Strenuous Peak Elevation: 780 feet Distance: Roughly 2 miles round trip from the trailhead Estimated Time: 1.0 hour Area: 118 acres includes Maino Open Space	Habitat: 27.14 acres Management / Grazing / Trail Corridor: 81.42 acres Restoration: 8.36 acres Cultural / Historic: 1.06 acres Total: 118 acres	1. Install signs / kiosks / trash and mutt mitts 2. Address trail erosion 3. Install fencing and enhance seasonal wetland areas 4. Invasive species control 5. Wildland-Urban Interface fuel reduction 6. Lemon Grove enhancement project upkeep


Large Kiosk
Small Kiosk
Mutt Mitts & Trash
Peak Bike Rack for 8
Bike Bell Box
Trailhead Entry Fence
Perimeter Fence
Opening Gate
Bridge or Crossing
Bench
Cattle Guard
Trail Direction Blade
Parking
Trailhead
Lemon Grove
The "M"
101
Higuera Street
Marsh Street
Trailhead
Cerro San Luis Natural Reserve
Map Key:
Reserve Boundary
Multi-Use Trails
Scale:
0
250
500
1,000
1,500
2,000
Feet
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CITY OF SAN LUIS OBISPO

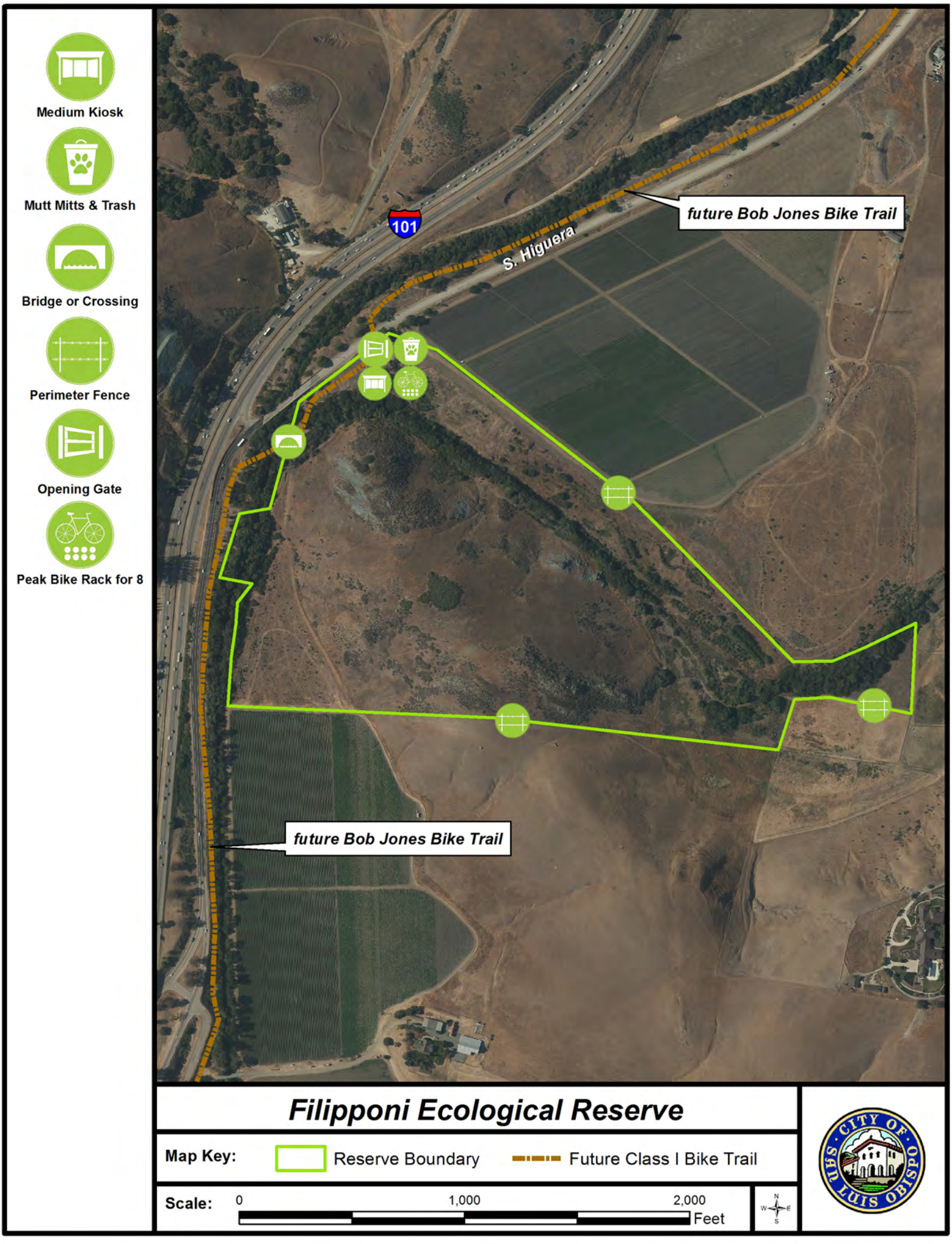
FILIPPONI ECOLOGICAL RESERVE

The Filipponi Ecological Reserve was purchased by the City in 2000. The Reserve comprises about 70 acres and has many site features. It was acquired for floodplain features and the main parcel was taken out of agriculture production. East Fork San Luis Obispo Creek comes through the northern parcel and has its confluence with San Luis Obispo Creek near the western border. The south eastern parcel contains a small amount of agricultural land that is currently fallow. Several mitigation and enhancement projects have been completed there, but the Reserve is not open to the public. This is a small Reserve and has been discussed to be opened to the public once the next segment of the Bob Jones Bike Trail comes through. This Reserve could be experienced with the addition of a boardwalk or trails more accessible to all users. There are currently no signs/kiosks and maintenance activities are minimal.

MAINTENANCE ACTIVITIES

Vegetation Maintenance	Structure Maintenance	Sign Maintenance	Trail/Road Maintenance	Drainage Maintenance	Trail Construction
Brushing / Clearing (Fuel reduction / Trails) N/A	Gate/Entry repair N/A	Sign design installation N/A	Road & Parking Maintenance N/A	Winterization/Cleaning culverts drainage ditches N/A	New Trails N/A
Remove fallen trees/branches N/A	Fence repair N/A	Sign repair N/A	Trail repair N/A	Erosion control N/A	Trail Maintenance N/A
Slope revegetation Seasonal Mowing	Bridge repair N/A	Sign replacement N/A	Trimming N/A	Install culverts and grade dips N/A	Decommission N/A
Invasive Species Control N/A	Kiosks,Trail Amenities N/A	Barricade Closure device repair N/A	Remove loose rocks N/A	Monitor/Repair drainage ditches N/A	Reroute N/A

Trails	Land Use Designation	Notable Maintenance Projects
There is currently no public access to the property.	Habitat: 68.4 acres Management / Trail Corridor: 1.4 acres Total: 69.8 acres	1. Install signs / kiosks / trash and mutt mitts 2. City maintenance of San Luis Obispo Creek main stem and East Fork of San Luis Obispo Creek for habitat protection and flood control 3. Coordinate with County of SLO for their maintenance of future Bob Jones Bike Trail extension through the site 4. City patrol and enforcement of San Luis Obispo Municipal Code 12.23 “Creeks, Tributaries, and Riparian Corridor Regulations” due to persistent transient use and occupation of San Luis Obispo Creek area on site and nearby 5. Maintenance and upkeep of constructed wetlands and restoration areas


Medium Kiosk
Mutt Mitts & Trash
Bridge or Crossing
Perimeter Fence
Opening Gate
Peak Bike Rack for 8
101
S. Higuera
future Bob Jones Bike Trail
future Bob Jones Bike Trail
Filipponi Ecological Reserve
Map Key:
Reserve Boundary
Future Class I Bike Trail
Scale:
0
1,000
2,000
Feet
CITY OF SAN LUIS OBISPO

IRISH HILLS NATURAL RESERVE

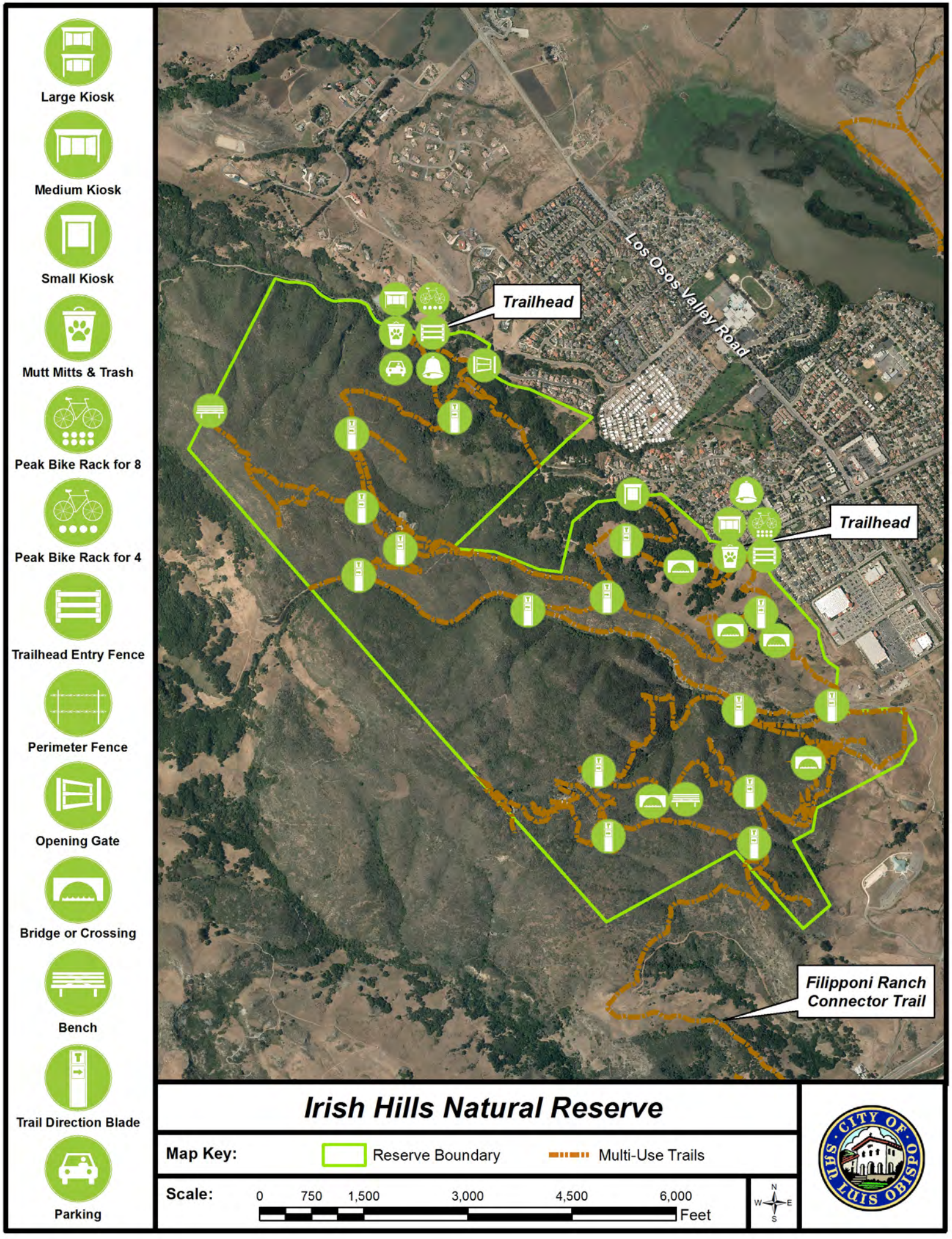
The Irish Hills Natural Reserve is a 1,110 acre area in the City of San Luis Obispo, west of Los Osos Valley Road. The Reserve consists of serpentine hill lands dominated by chaparral, oak woodland, and grassland on generally steep terrain ranging from 140 feet to just under 1,160 feet at the highest point. Two perennial streams, Prefumo Creek and Froom Creek, cross portions of the Reserve. Irish Hills contains a number of important natural and historical features, including: threatened Steelhead trout in the two streams, chapparral, oak woodland, and grassland on serpentine soils, 4 former quarry sites, and large tracts of intact, high quality wildlife habitat. The Open Space is known for its views, its relatively pristine landscape, and trail system, that is a holdover from past mineral exploration.

Irish Hills Conservation Plan
http://www.slocity.org/home/showdocument?id=1924

MAINTENANCE ACTIVITIES

Vegetation Maintenance	Structure Maintenance	Sign Maintenance	Trail/Road Maintenance	Drainage Maintenance	Trail Construction
Brushing / Clearing (Fuel reduction / Trails) Y	Gate/Entry repair Y	Sign design installation Y	Road & Parking Maintenance N/A	Winterization/Cleaning culverts drainage ditches	New Trails Y
Remove fallen trees/branches Y	Fence repair Y	Sign repair Y	Trail repair Y	Erosion control	Trail Maintenance Y
Slope revegetation Seasonal Mowing	Bridge repair Y	Sign replacement Y	Trimming Y	Install culverts and grade dips	Decommission Y
Invasive Species Control Y	Kiosks,Trail Amenities Y	Barricade Closure device repair	Remove loose rocks Y	Monitor/Repair drainage ditches	Reroute N/A

Trails	Land Use Designation	Notable Maintenance Projects
Difficulty: Strenuous Elevation: 1,100 feet at highest point Distance: 5-7 miles round trip Estimated Time: 2-4 hours Total Area: 1110 acres	Habitat: 1046.5 acres Management / Trail Corridor: 47 acres Restoration: 13.5 acres Cultural / Historic: 3 acres Total: 1110 acres	1. Install signs / kiosks / trash and mutt mitts 2. Address trail erosion; close old unsustainable trails 3. Invasive species control 4. Wildland-Urban Interface fuel reduction 5. Coordinate with PG&E on clearance for overhead powerlines 6. Continue decommissioning of old Froom Creek jeep road


Large Kiosk
Medium Kiosk
Small Kiosk
Mutt Mitts & Trash
Peak Bike Rack for 8
Peak Bike Rack for 4
Trailhead Entry Fence
Perimeter Fence
Opening Gate
Bridge or Crossing
Bench
Trail Direction Blade
Parking
Trailhead
Los Osos Valley Road
Trailhead
Filipponi Ranch Connector Trail
Irish Hills Natural Reserve
Map Key:
Reserve Boundary
Multi-Use Trails
Scale:
0
750
1,500
3,000
4,500
6,000
Feet
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CITY OF SAN LUIS OBISPO

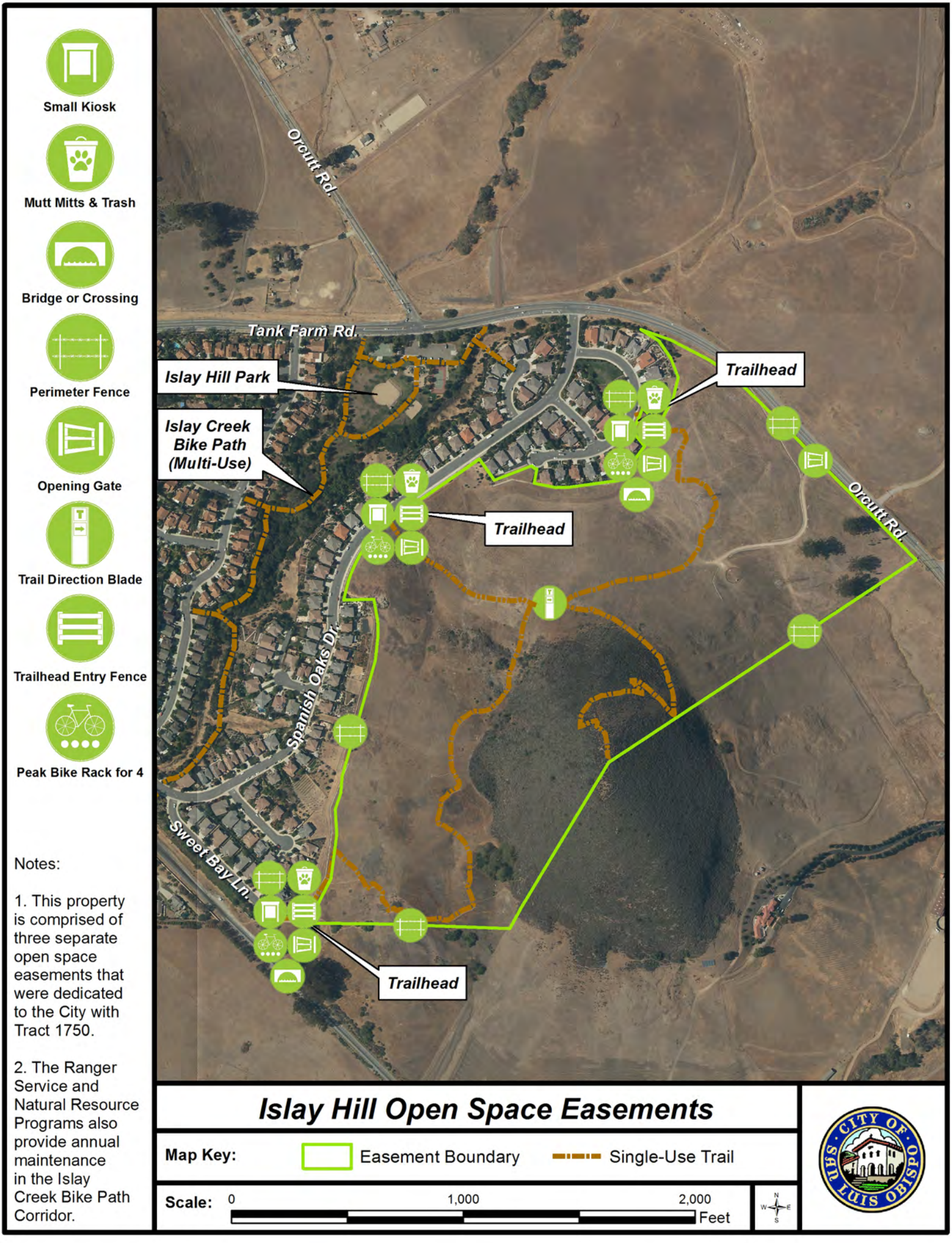
ISLAY HILL OPEN SPACE

Islay Hill is the southernmost Morro of the series of nine in the City of San Luis Obispo. “Islay” comes from the Salinan word Yslay or Slay meaning wild cherry or chokecherry. The property is encumbered by three separate Open Space Easements held by the City of San Luis Obispo that were recorded in the 1990’s as conditions of approval for the subdivision of Tract 1750. The property owners and the City of San Luis Obispo are working cooperatively to re-establish a grazing regime for vegetation management and wildland fire protection purposes. In order to safely and efficiently conduct such a program, the property owners will also need to establish exterior fencing surrounding the grazing pasture. Both grazing and the correspondent fencing are retained property rights and allowed uses under the terms of the Open Space Easements with City approval. Residents of San Luis Obispo and the surrounding area are well accustomed to being able to enjoy this open space land for hiking and other passive recreation uses.

MAINTENANCE ACTIVITIES

Vegetation Maintenance	Structure Maintenance	Sign Maintenance	Trail/Road Maintenance	Drainage Maintenance	Trail Construction
Brushing / Clearing (Fuel reduction / Trails) Y	Gate/Entry repair Y	Sign design installation Y	Road & Parking Maintenance N/A	Winterization/Cleaning culverts drainage ditches	New Trails N/A
Remove fallen trees/branches Y	Fence repair Y	Sign repair Y	Trail repair Y	Erosion control	Trail Maintenance Y
Slope revegetation Seasonal Mowing N/A	Bridge repair Y	Sign replacement Y	Trimming Y	Install culverts and grade dips	Decommission Y
Invasive Species Control Y	Kiosks,Trail Amenities Y	Barricade Closure device repair	Remove loose rocks Y	Monitor/Repair drainage ditches	Reroute N/A

Trails	Land Use Designation	Notable Maintenance Projects
Difficulty: Strenuous Elevation: 220-775 feet Distance: 2 miles round trip Estimated Time: 1 hour Area: 73.5 acres	Habitat: 18.2 acres Management / Grazing / Trail Corridor: 55.3 acres Total: 73.5 acres	1. Install signs / kiosks / trash and mutt mitts 2. Address trail erosion 3. Invasive species control 4. Wildland-Urban Interface fuel reduction


Small Kiosk
Mutt Mitts & Trash
Bridge or Crossing
Perimeter Fence
Opening Gate
Trail Direction Blade
Trailhead Entry Fence
Peak Bike Rack for 4
Orcutt Rd.
Tank Farm Rd.
Islay Hill Park
Islay Creek Bike Path (Multi-Use)
Trailhead
Trailhead
Trailhead
Orcutt Rd.
Spanish Oaks Dr.
Sweet Bay Ln.
Notes:
1. This property is comprised of three separate open space easements that were dedicated to the City with Tract 1750.
2. The Ranger Service and Natural Resource Programs also provide annual maintenance in the Islay Creek Bike Path Corridor.
Islay Hill Open Space Easements
Map Key:
Easement Boundary
Single-Use Trail
Scale:
0
1,000
2,000
Feet
N
W
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CITY OF SAN LUIS OBISPO

JOHNSON RANCH OPEN SPACE

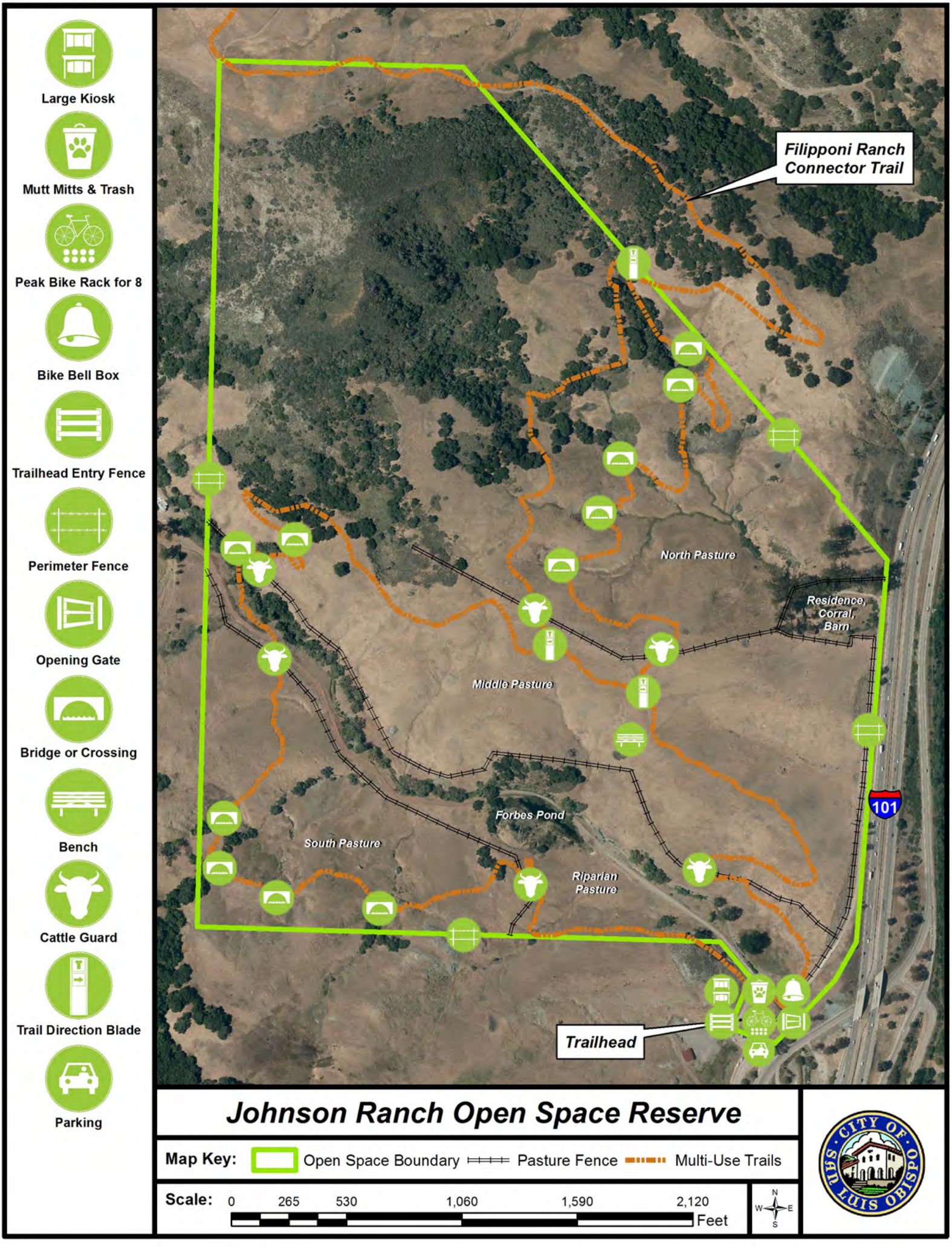
The Johnson Ranch Open Space is a 242 acre natural area located about 1.5 miles south of the City of San Luis Obispo, on the west side of US Highway 101. Elevations on the property range from 80 feet above sea level at the southeasterly corner of the property to 761 feet above sea level atop the hill on the northern portion of the site. Johnson Ranch contains several natural habitat types and sensitive and rare plant species. Serpentine bunchgrass and rock outcrops, annual grasslands, oak woodland, chaparral, wetland seeps and seasonal drainages are found on the property.

Johnson Ranch Conservation Plan
http://www.slocity.org/home/showdocument?id=1926

MAINTENANCE ACTIVITIES

Vegetation Maintenance	Structure Maintenance	Sign Maintenance	Trail/Road Maintenance	Drainage Maintenance	Trail Construction
Brushing / Clearing (Fuel reduction / Trails) Y	Gate/Entry repair Y	Sign design installation Y	Road & Parking Maintenance	Winterization/Cleaning culverts drainage ditches	New Trails N/A
Remove fallen trees/branches Y	Fence repair Y	Sign repair Y	Trail repair Y	Erosion control	Trail Maintenance Y
Slope revegetation Seasonal Mowing	Bridge repair Y	Sign replacement Y	Trimming	Install culverts and grade dips	Decommission Y
Invasive Species Control Y	Kiosks,Trail Amenities Y	Barricade Closure device repair	Remove loose rocks Y	Monitor/Repair drainage ditches	Reroute Y

Trails	Land Use Designation	Notable Maintenance Projects
Johnson Ranch Loop Difficulty: Moderate Elevation: 320 ft Distance: 3.3 miles Estimated Time: 1 hours 15 minutes Area: 242 acres	Habitat: 91 acres Management / Grazing / Trail Corridor: 134 acres Restoration: 12 acres Cultural / Historic: 5 acres Total: 242 acres	1. Install signs / kiosks / trash and mutt mitts 2. Improve perimeter and pasture fencing; stock watering 3. Address trail erosion 4. Wildland-Urban Interface fuel reduction 5. Maintain mitigation plantings and wetland creation projects 6. Maintain historic residence and barns in coordination with lessee 7. Maintain access road in coordination with neighboring easement holder


Large Kiosk
Mutt Mitts & Trash
Peak Bike Rack for 8
Bike Bell Box
Trailhead Entry Fence
Perimeter Fence
Opening Gate
Bridge or Crossing
Bench
Cattle Guard
Trail Direction Blade
Parking
Filipponi Ranch Connector Trail
North Pasture
Residence, Corral, Barn
Middle Pasture
Forbes Pond
South Pasture
Riparian Pasture
101
Trailhead
Johnson Ranch Open Space Reserve
Map Key:
Open Space Boundary
Pasture Fence
Multi-Use Trails
Scale:
0
265
530
1,060
1,590
2,120
Feet
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CITY OF SAN LUIS OBISPO

LAGUNA LAKE NATURAL RESERVE

Laguna Lake Natural Reserve is remarkably diverse in its natural landscape features. The open water lake is for the most part surrounded by wetland marsh habitat characterized by bulrush and willows, except for the more open southeast arm extending towards Madonna Road. On the south side of the Reserve, Prefumo Creek forms a dense willow riparian forest that is also marked by larger sycamore and cottonwood trees, as well as coast live oaks on the margins, until it reaches a stabilized delta area at the outlet into the lake. A long peninsula feature juts out into the lake from the north shore. Behind that is a relatively flat grassland meadow area that is traversed by a series of drainages, seeps and swales, as well as a network of pleasant walking trails. The northern side of the Reserve gives way to a steep serpentine rock outcrop ridgeline that affords outstanding views of the lake below, the Morros, the Irish Hills, Los Osos Valley, and the lower San Luis Obispo Creek watershed.

Laguna Lake Conservation Plan

http://www.slocity.org/government/department-directory/city-administration/natural-resources/laguna-lake

MAINTENANCE ACTIVITIES

Vegetation Maintenance	Structure Maintenance	Sign Maintenance	Trail/Road Maintenance	Drainage Maintenance	Trail Construction
Brushing / Clearing (Fuel reduction / Trails) N/A	Gate/Entry repair Y	Sign design installation Y	Road & Parking Maintenance N/A	Winterization/Cleaning culverts drainage ditches N/A	New Trails N/A
Remove fallen trees/branches N/A	Fence repair Y	Sign repair Y	Trail repair Y	Erosion control Y	Trail Maintenance Y
Slope revegetation Seasonal Mowing N/A	Bridge repair N/A	Sign replacement Y	Trimming N/A	Install culverts and grade dips Y	Decommission Y
Invasive Species Control Y	Kiosks,Trail Amenities Y	Barricade Closure device repair ❄	Remove loose rocks Y	Monitor/Repair drainage ditches Y	Reroute N/A

Trails	Land Use Designation	Notable Maintenance Projects
Difficulty: Easy Elevation: 120- 200 ft Distance: 1.2-1.6 miles round trip Estimated Time: 30 minutes Area: 344 acres	Habitat: 276 acres Management / Grazing / Restoration: 65 acres Management / Trail Corridor: 3 acres Total: 344 acres	1. Install signs / kiosks / trash and mutt mitts 2. Implement sediment management strategies (dredging, sediment basins, shoreline stabilization) 3. Coordinate with PG&E on clearance for overhead powerlines 4. Maintain exclosure fencing for endangered Chorro Creek bog thistle population


Medium Kiosk
Small Kiosk
Mutt Mitts & Trash
Peak Bike Rack for 4
Trailhead Entry Fence
Perimeter Fence
Opening Gate
Bridge or Crossing
Bench
Trail Direction Blade
Parking
Cattle Guard
Trailhead
Trailhead
Los Osos Valley Road
Madonna Road
101
Laguna Lake Natural Reserve
Map Key:
Reserve Boundary
Pasture Fence
Trails
Scale:
0
2,500
5,000
Feet
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CITY OF SAN LUIS OBISPO

RESERVOIR CANYON NATURAL RESERVE
BOWDEN RANCH OPEN SPACE

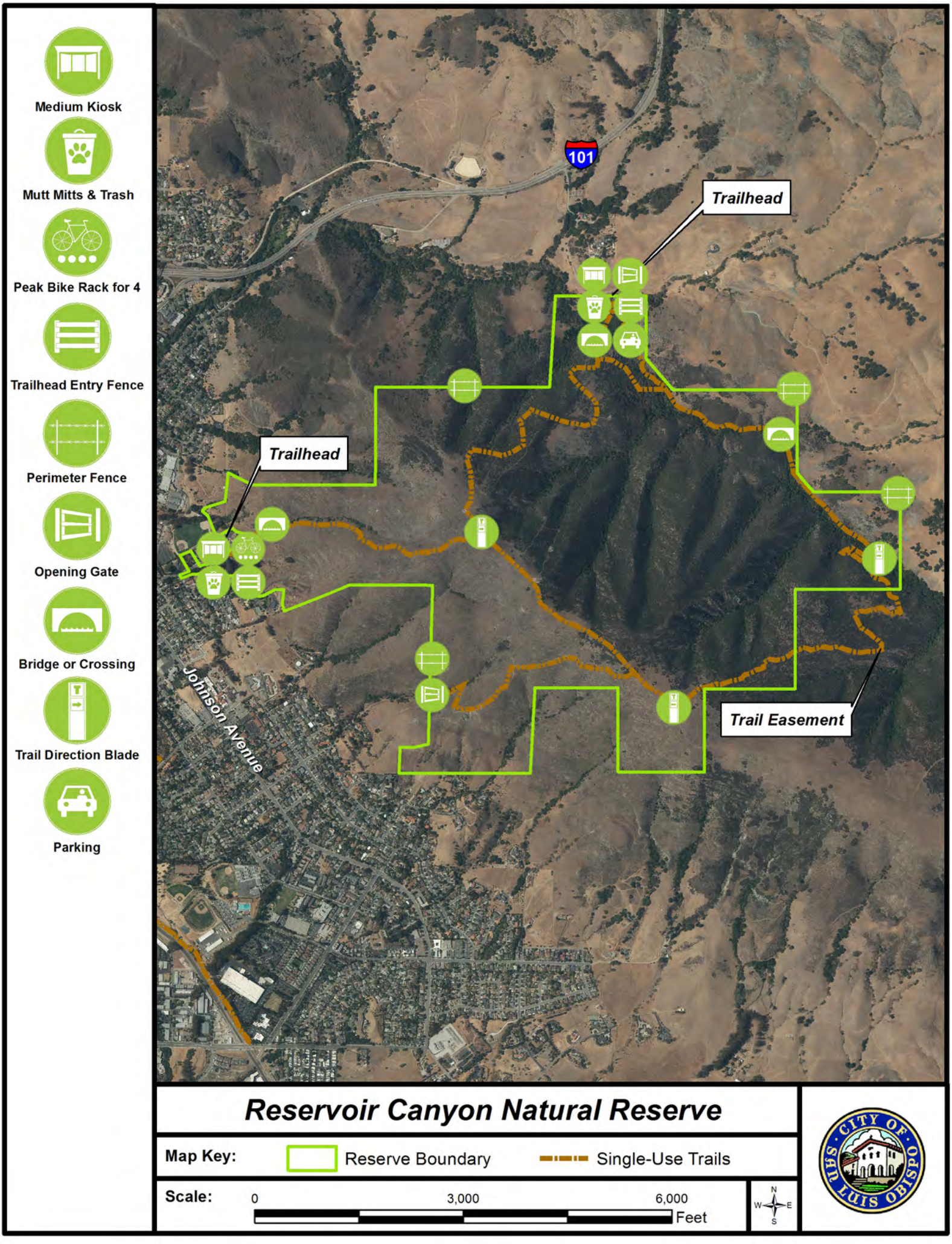
Reservoir Canyon Natural Reserve is located just northeast of the City of San Luis Obispo and is situated on nearly 800 acres of open space owned by the City. It contains the Reservoir Canyon and Bowden Ranch Open Spaces. The canyon features a perennial creek fed by several streams, which contribute to a rich and diverse natural setting. Several habitat types, including chaparral, serpentine coastal scrub, serpentine grassland, and riparian. Key plant species include mariposa lilies, owl's clover, dudleyas, spineflowers, and the endangered Chorro Creek bog thistle. Reservoir Canyon offers a unique opportunity for passive recreation within an environment full of native and rare plants.

Reservoir Canyon Conservation Plan
http://www.slocity.org/home/showdocument?id=1922

MAINTENANCE ACTIVITIES

Vegetation Maintenance	Structure Maintenance	Sign Maintenance	Trail/Road Maintenance	Drainage Maintenance	Trail Construction
Brushing / Clearing (Fuel reduction / Trails) Y	Gate/Entry repair Y	Sign design installation Y	Road & Parking Maintenance	Winterization/Cleaning culverts drainage ditches	New Trails Y
Remove fallen trees/branches Y	Fence repair Y	Sign repair Y	Trail repair Y	Erosion control Y	Trail Maintenance Y
Slope revegetation Seasonal Mowing	Bridge repair Y	Sign replacement Y	Trimming Y	Install culverts and grade dips Y	Decommission Y
Invasive Species Control Y	Kiosks,Trail Amenities Y	Barricade Closure device repair	Remove loose rocks Y	Monitor/Repair drainage ditches Y	Reroute N/A

Trails	Land Use Designation	Notable Maintenance Projects
Difficulty: Moderate to Difficult Elevation: 400 - 1,712 feet Distance: 3.2 miles one way Estimated Time: 2.5- 3 hours Area: 789 acres	Habitat: 725 acres Management / Grazing / Trail Corridor: 70 acres Restoration: 1 acres Cultural / Historic: 2 acres Total: 789 acres	1. Install signs / kiosks / trash and mutt mitts 2. Address trail erosion 3. Coordinate with PG&E on maintenance and restoration of powerline corridor 4. Coordinate with Friends of La Loma Adobe on Bowden Ranch trailhead 5. Wildland-Urban Interface fuel reduction 6. Improved parking on Reservoir Canyon side and all-season creek crossings


Medium Kiosk
Mutt Mitts & Trash
Peak Bike Rack for 4
Trailhead Entry Fence
Perimeter Fence
Opening Gate
Bridge or Crossing
Trail Direction Blade
Parking
101
Trailhead
Trailhead
Trail Easement
Johnson Avenue
Reservoir Canyon Natural Reserve
Map Key:
Reserve Boundary
Single-Use Trails
Scale:
0
3,000
6,000
Feet
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CITY OF SAN LUIS OBISPO

SAN LUIS OBISPO CREEK NATURAL RESERVE

San Luis Obispo Creek Natural Reserve is comprised of three properties, the Bianchi Lane Open Space, Mathews Open Space donated by the Mathews Family and "The Bulb". The Bianchi Lane Open Space was acquired by the City in 1977 from the State of California. This parcel was part of Caltrans Right-of-Way (ROW) purchased by the City with the master-plan of using that property for flood control. This parcel and the adjacent downstream property called "The Bulb", factor into the Mid-Higuera Bypass Project which is under design and calls for 2 significant flood bypass channels, one on each parcel. The Bianchi Lane Open Space comprises approximately 5 acres, has a sign with rules and regulations and a trail/maintenance road. Annual winter and summer vegetation maintenance occurs on this property. The Bulb is another approximately 5 acre parcel that is currently landlocked (access to the property is from Hwy 101) and again annual winter and summer maintenance programs take place here.

MAINTENANCE ACTIVITIES

Vegetation Maintenance	Structure Maintenance	Sign Maintenance	Trail/Road Maintenance	Drainage Maintenance	Trail Construction
Brushing / Clearing (Fuel reduction / Trails)	Gate/Entry repair Y	Sign design installation Y	Road & Parking Maintenance N/A	Winterization/Cleaning culverts drainage ditches	New Trails N/A
Remove fallen trees/branches Y	Fence repair N/A	Sign repair Y	Trail repair N/A	Erosion control	Trail Maintenance N/A
Slope revegetation Seasonal Mowing	Bridge repair N/A	Sign replacement Y	Trimming N/A	Install culverts and grade dips N/A	Decommission N/A
Invasive Species Control Y	Kiosks,Trail Amenities N/A	Barricade Closure device repair	Remove loose rocks N/A	Monitor/Repair drainage ditches N/A	Reroute N/A

Trails	Land Use Designation	Notable Maintenance Projects
Bianchi Lane Trail Difficulty: Easy Elevation: Level Distance: 625 feet Total Area: 11.4 acres	Habitat: 7.6 acres Management / Trail Corridor: 3.8 acres Total: 11.4 acres	1. Install signs / kiosks / trash and mutt mitts 2. City maintenance of San Luis Obispo Creek for habitat protection and flood control 3. City maintenance of future Bob Jones Bike Trail extension through the site 4. City patrol and enforcement of San Luis Obispo Municipal Code 12.23 "Creeks, Tributaries, and Riparian Corridor Regulations" due to persistent transient use and occupation of San Luis Obispo Creek area on site and nearby

Medium Kiosk

Small Kiosk

Mutt Mitts & Trash

Bridge or Crossing

Perimeter Fence

Opening Gate

Notes:

1. This Reserve is comprised of three separate open spaces, and is therefore a "Natural Reserve" in accordance with SLO Muni Code 12.22. It is referred to herein as the San Luis Obispo Creek Natural Reserve.

2. This site is anticipated for the Mid-Higuera Bypass Flood Control and Habitat Improvement Project, as well as a future segment of the Bob Jones Bike Trail.

San Luis Obispo Creek Natural Reserve

Map Key: Reseve Boundary — Multi-Use Trail

Scale: 0 — 600 — 1,200 Feet

CITY OF SAN LUIS OBISPO

SOUTH HILLS NATURAL RESERVE

The South Hills Natural Reserve is located on the southern part of town and is a rocky serpentine series of hills which are part of the Morro Rock-Islay Hill outcrop complex. The property is approximately 131 acres and is situated north of Tank Farm Road, east of South Higuera Street and south of South Street. The elevation ranges between 200 and 575 feet. South Hills contains several natural habitat types and 8 sensitive and rare plant species located on the property. Serpentine bunchgrass and rock outcrops, annual grasslands, wetland seeps (both natural and artificial) and several temporary drainages are found on the property. The South Hills Natural Reserve supports a special complex of rare plants and animals.

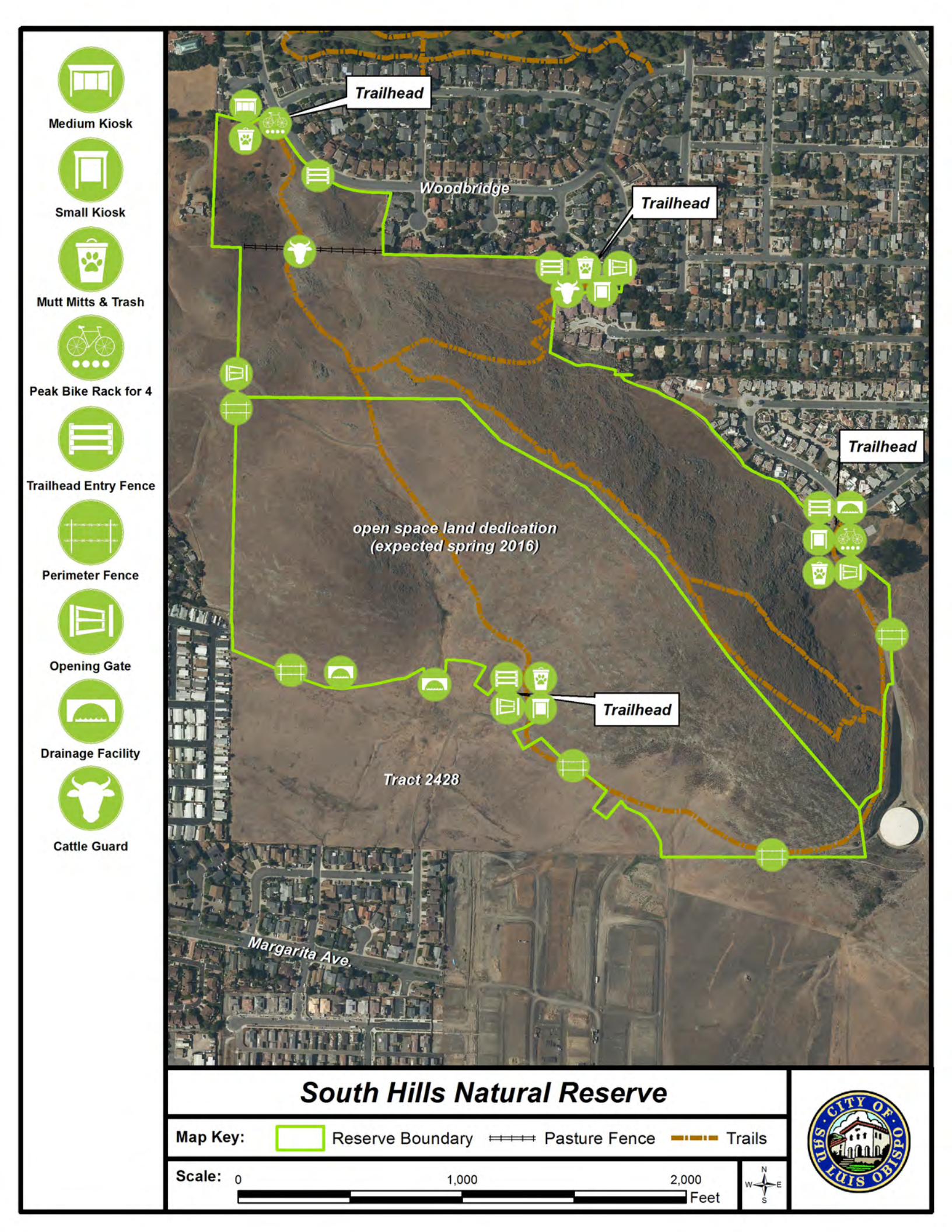
South Hills Conservation Plan

http://www.slocity.org/home/showdocument?id=1928

MAINTENANCE ACTIVITIES

Vegetation Maintenance	Structure Maintenance	Sign Maintenance	Trail/Road Maintenance	Drainage Maintenance	Trail Construction
Brushing / Clearing (Fuel reduction / Trails) N/A	Gate/Entry repair Y	Sign design installation Y	Road & Parking Maintenance Y	Winterization/Cleaning culverts drainage ditches	New Trails N/A
Remove fallen trees/branches Y	Fence repair Y	Sign repair Y	Trail repair Y	Erosion control	Trail Maintenance Y
Slope revegetation Seasonal Mowing	Bridge repair N/A	Sign replacement Y	Trimming Y	Install culverts and grade dips	Decommission Y
Invasive Species Control Y	Kiosks,Trail Amenities Y	Barricade Closure device repair	Remove loose rocks Y	Monitor/Repair drainage ditches	Reroute N/A

Trails	Land Use Designation	Notable Maintenance Projects
Difficulty: Easy to Moderate Elevation: 580 feet Distance: 2 miles round trip Estimated Time: 1 hour Total Area: 131.1 acres	Habitat: 125.5 acres Management / Trail Corridor: 4 acres Restoration: 1.5 acres Cultural / Historic: .1 Total: 131.1 acres	1. Install signs / kiosks / trash and mutt mitts 2. Address trail erosion 3. Maintain restoration projects with rare plants 4. Wildland-Urban Interface fuel reduction (evaluate future livestock grazing management plan for maintenance and ecologically-beneficial purposes)


Medium Kiosk
Small Kiosk
Mutt Mitts & Trash
Peak Bike Rack for 4
Trailhead Entry Fence
Perimeter Fence
Opening Gate
Drainage Facility
Cattle Guard
Trailhead
Woodbridge
Trailhead
Trailhead
open space land dedication
(expected spring 2016)
Trailhead
Tract 2428
Margarita Ave.
South Hills Natural Reserve
Map Key:
Reserve Boundary
Pasture Fence
Trails
Scale:
0
1,000
2,000
Feet
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CITY OF SAN LUIS OBISPO

STENNER SPRINGS OPEN SPACE

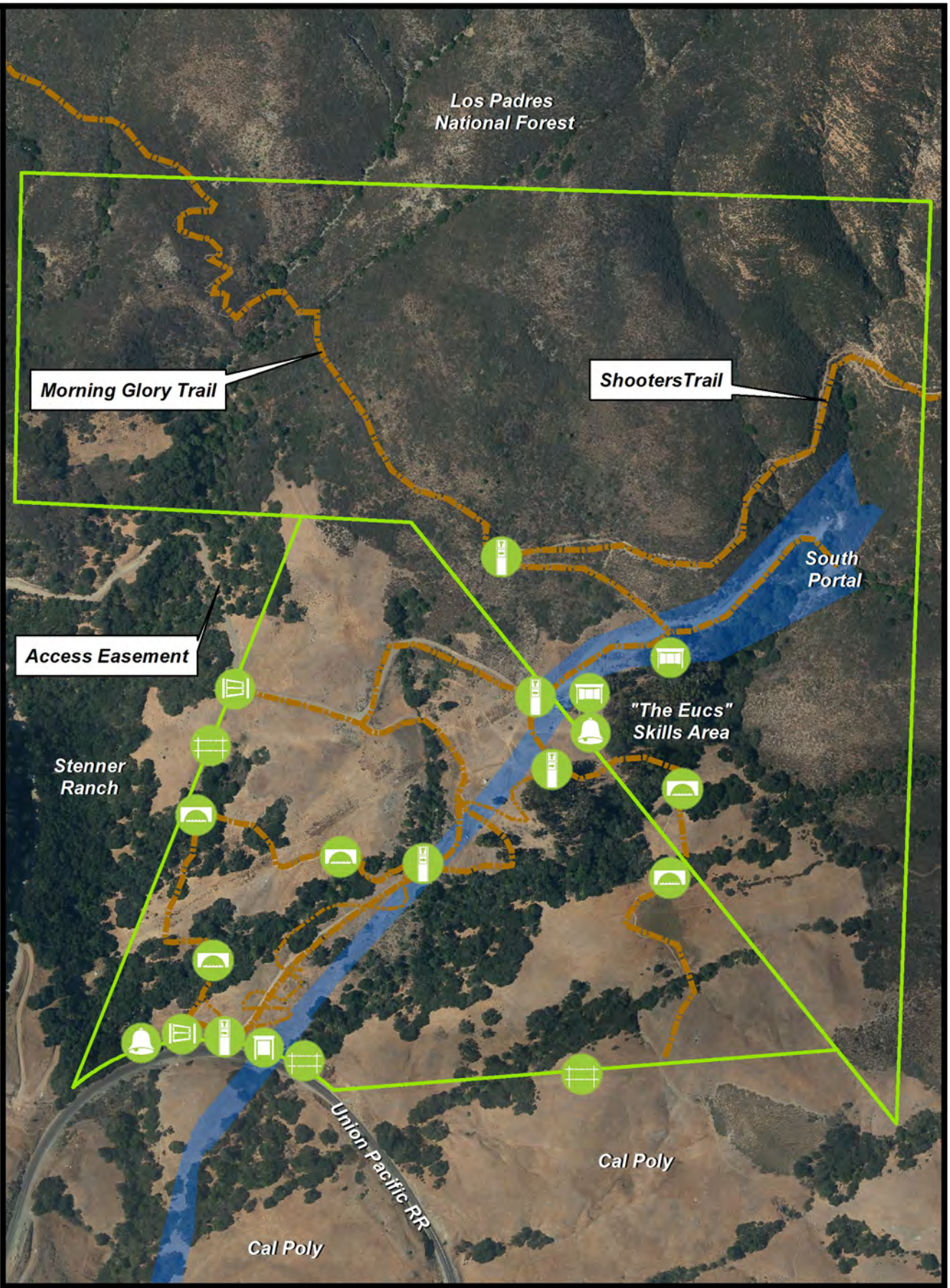
The Stenner Springs Natural Reserve is a 363 acre area in four parcels situated among the Los Padres National Forest, Camp San Luis Obispo, Cal Poly and the privately owned Stenner Ranch. The property lies 4 miles north of the City of San Luis Obispo. Parcels 1, 2, and 3 have long been enjoyed for their hiking, biking, outdoor education, and research opportunities. In contrast, parcel 4 lies within the boundaries of Camp San Luis Obispo and has historically not been accessible for public recreational use. The land is referred to as Stenner Springs because of the numerous springs on the property which flow into Stenner Creek, a perennial stream that flows from this site through the Cal Poly campus and several ranch properties into the City of San Luis Obispo. The property is generally rugged, steep and covered with dense brush and is used primarily for watershed protection, and limited recreation.

Stenner Springs Conservation Plan

http://www.slocity.org/home/showdocument?id=1930

MAINTENANCE ACTIVITIES					
Vegetation Maintenance	**Structure Maintenance**	**Sign Maintenance**	**Trail/Road Maintenance**	**Drainage Maintenance**	**Trail Construction**
Brushing / Clearing (Fuel reduction / Trails) Y	Gate/Entry repair Y	Sign design installation Y	Road & Parking Maintenance Y	Winterization/Cleaning culverts drainage ditches	New Trails N/A
Remove fallen trees/branches Y	Fence repair Y	Sign repair Y	Trail repair Y	Erosion control	Trail Maintenance Y
Slope revegetation Seasonal Mowing	Bridge repair Y	Sign replacement Y	Trimming Y	Install culverts and grade dips	Decommission Y
Invasive Species Control Y	Kiosks,Trail Amenities Y	Barricade Closure device repair	Remove loose rocks Y	Monitor/Repair drainage ditches	Reroute Y

Trails	Land Use Designation	Notable Maintenance Projects
Parts or all of the trails Botanical, Shooters, Morning Glory, Eucalyptus, and Elevator pass through the Stenner Springs Natural Reserve. The trails may also go through Los Padres National Forest and Cal Poly property. Difficulty: Moderate to Strenuous Total Area: 363 acres	Habitat: 289 acres Management / Trail Corridor: 63 acres Restoration: 12 acres Total: 363 acres	1. Install signs / kiosks / trash and mutt mitts 2. Address trail erosion 3. Invasive species control 4. Install protective fencing around main spring area 5. Coordinate with Utilities, County of SLO Public Works, and Central Coast Water Authority on road maintenance, easement areas, and the South Portal 6. Coordinate with Camp San Luis Obispo on maintenance of the “50/50” parcel and with Cal Poly and US Forest Service on regional trail infrastructure into and out of the property.



Medium Kiosk

Small Kiosk

Bike Bell Box

Bridge or Crossing

Perimeter Fence

Opening Gate

Trail Direction Blade

Notes:

1. SSNR contains two other parcels (not shown) with no improvements other than trails.

2. SSNR contains the South Portal & two water pipelines maintained by Utiltiies, County of SLO, and Central Coast Water Authority (CCWA).

3. "The Eucs" is maintained by FASTA.

Stenner Springs Natural Reserve

Map Key: Reserve Boundary — Trails — CCWA Easement

Scale: 0 — 750 — 1,500 Feet

N W E S

CITY OF SAN LUIS OBISPO

TERRACE HILL OPEN SPACE

The Terrace Hill Open Space provides beautiful panoramic views of San Luis Obispo. The trail is short and quickly leads to a terraced plateau. The summit of Terrace Hill was bulldozed many years ago, creating a mesa at the highest point. From the terraced plateau you can view many of the other Morros. To the north and east is the Santa Lucia Range, which defines the city's border. Terrace Hill offers a full host of both natural and modified landscape features across a site of 23 acres. The primary entry and access to the site is from Bishop Street, where a locked gate can be opened to a dirt road that leads to the top of the hill. Terrain ranges from nearly level along the top, to steep side slopes. A second trailhead exists along a narrow, paved path beginning at the corner of Rachel Street and Jennifer Street facilitated by a public, pedestrian access easement. There are four memorial viewing benches that have been installed by the City along the perimeter of the loop trail at the top of the hill. A drainage basin and facility exists near the Bishop Street entrance, while five-strand barbed wire fence protects the frontage of Terrace Hill along Bishop Street to prevent unauthorized vehicle access and unsanctioned trails. The City's Utilities Department maintains a large water storage tank at the southeast corner along Bishop Street, but this structure is on a separate parcel and is not considered a part of Terrace Hill Open Space.

Terrace Hill Conservation Plan http://www.slocity.org/home/showdocument?id=5917

MAINTENANCE ACTIVITIES					
Vegetation Maintenance	**Structure Maintenance**	**Sign Maintenance**	**Trail/Road Maintenance**	**Drainage Maintenance**	**Trail Construction**
Brushing / Clearing (Fuel reduction / Trails) Y	Gate/Entry repair Y	Sign design installation Y	Road & Parking Maintenance Y	Winterization/Cleaning culverts drainage ditches	New Trails Y
Remove fallen trees/branches Y	Fence repair Y	Sign repair Y	Trail repair Y	Erosion control	Trail Maintenance Y
Slope revegetation Seasonal Mowing	Bridge repair N/A	Sign replacement Y	Trimming Y	Install culverts and grade dips	Decommission Y
Invasive Species Control Y	Kiosks,Trail Amenities Y	Barricade Closure device repair	Remove loose rocks Y	Monitor/Repair drainage ditches	Reroute Y

Trails	Land Use Designation	Notable Maintenance Projects
Difficulty: Easy to Moderate Elevation: 500 ft Distance: 0.4 miles round trip Estimated Time: 20 minutes Area: 23 acres	Habitat: 20 acres Management / Trail Corridor: 3 acres Total: 23 acres	1. Install signs / kiosks / trash and mutt mitts 2. Restore westside trail above Jennifer Street 3. Regular trash and broken glass pick-up 4. Remove derelict drip tubing 5. Maintain drainage basins and culverts 6. Implement pilot project for seasonal goat grazing

Terrace Hill Open Space Reserve

Map Key: Open Space Boundary — Trail Restoration — Trails

Scale: 0 — 500 — 1,000 Feet

N W E S

CITY OF SAN LUIS OBISPO

ACKNOWLEDGEMENTS

Prepared by the City of San Luis Obispo's Open Space Team, a partnership of the Natural Resources Protection and Ranger Service Programs. Graphic design by Jamie Bell, Parks and Recreation Marketing Specialist. Special recognition goes to the following individuals for their valuable contributions to this document.

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Shelly Stanwyck, Parks and Recreation Director
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Lindsey Stephenson, Administrative Analyst

City of San Luis Obispo
Vegetation Management Plan:
The Wildland-Urban Interface

Prepared for:

City of San Luis Obispo
Natural Resources Protection Program
Fire Department

Prepared by:

Danielle Rose Althaus
Master of City & Regional Planning
California Polytechnic State University, San Luis Obispo

June 2014

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EXECUTIVE SUMMARY

The City of San Luis Obispo is located in San Luis Obispo County on the Central Coast of California, with a population of about 45,000 people (U.S. Census Bureau, 2010 Census). There are 12 large open space lands totaling about 4,000 acres, as well as additional conservation easements, all operated by the City.

This plan is intended to be a comprehensive document which addresses how the City is managing wildfire preparedness in city-owned Open Space properties. This document could be used to organize and prioritize future pre-fire and vegetation management projects in the Open Space properties. Each Open Space property is addressed, identifying its location, vegetation, topography, assets, access points, water supply, evacuation routes, historical fire data, predominant risk exposure, current wildfire preparedness plan, as well as a priority ranking. There is also a proposed implementation plan.

Management Plan Framework

The Conservation and Open Space Element of the City of San Luis Obispo General Plan requires that each Open Space in San Luis Obispo have its own "Open Space Conservation Plan," and that each of those plans shall contain a "Wildfire Preparedness Plan." The content developed for each open space in the Management Plan will be consistent with General Plan, and be contributing to, deriving information from, and adding to the Wildfire Preparedness Plan sections in the Conservation Plans for each Open Space.

Goals

The goal of this Vegetation Management Plan is to:

- Reduce total cost and losses of life and property from wildland fire

This will be achieved through the following objectives:

- Describe all open space properties owned by the city
- Assess pre-fire management prescriptions
- Identify high-risk areas and ways to reduce hazards and risks
- Promote continuous multidisciplinary and intergovernmental collaborative efforts to reduce wildland fire risk

DESCRIPTION OF THE CITY AND FIRE PROTECTION DISTRICT

Overview of the City of San Luis Obispo

The City of San Luis Obispo is located in San Luis Obispo County on the central coastal of California. It is approximately 12.8 square miles, located in a valley surrounded by the Coastal Range. The topography of San Luis Obispo is extremely hilly. Additionally, State Highways 1 and 101, San Luis Creek, Southern Pacific Railroad lines, and mountains split the community.

The City has a fire protection contract with California Polytechnic State University (Cal Poly) to provide emergency services to students and faculty, although the University itself it is not located in the city limits. There are approximately 20,000 students and faculty at the university as of 2011. Cal Poly is recognized internationally for its excellence in preparing undergraduates for careers in applied technical and professional fields. Cal Poly graduates are highly sought after to fill architecture, agriculture, business, computer science and engineering positions.

The Diablo Canyon Nuclear Power Plant, operated by Pacific Gas and Electric Company, consists of two nuclear power generating units. This plant is located on the San Luis Obispo County coast approximately 12 miles southwest of the City. Diablo Canyon has been identified as a potential terrorist target and is on the California National Guard's Critical Asset List. The City is in the Basic Emergency Planning Zone (BEPZ) established by the California Emergency Management Agency (Cal EMA) as required by the Nuclear Regulatory Commission and FEMA.

San Luis Obispo County is primarily a rural and agricultural area encompassing 3,300 square miles of land, 100 miles of coastline, and is home to over 238,000 residents. There are seven cities within the County borders, but large unincorporated areas separate most of them. The County's location and size dictates that individual fire agencies use mutual aid assistance from their neighboring agencies.

Demographics

The City of San Luis Obispo is a beautiful central coast community with a population of 44,350. The San Luis Obispo area presents a unique combination of rural living and a sophisticated cultural environment, enhanced by the presence of Cal Poly State University. The City is the County seat and center of County activity, with a daytime population of over 75,000.

Climate

The climate is pleasant year round with summer temperatures rarely exceeding 90 degrees and it is not uncommon to have winter days in the 70s. The ideal weather provides numerous opportunities for outdoor recreation. San Luis Obispo is a destination location for tourists.

Water

The water distribution program delivers potable water from the water treatment plant and wells to customers and fire hydrants via ten pump stations, thirteen water storage facilities, and approximately 170 miles of water mains. It is unlikely this basic distribution pattern will change, since the water treatment plant will continue to be the principal source of treated water for the City.

Growth within the City has placed increased demands on the water distribution system. Additionally, some of the pipes in the system are undersized based on current standards which reduce the fire flow capacity. The undersized pipes will be replaced over time with new 8-inch or larger mains that will improve fire flow capabilities. Even without growth or fire protection requirements, aging pipes must be replaced to avoid major service disruptions and leaks due to deterioration.

There are approximately 170 miles of water distribution pipelines throughout the City. The engineering estimate for the life expectancy of these facilities is 50 years. Complete replacement within the term of life expectancy would require that the City replace an average of 2% of the system infrastructure each year, which the City has established as the goal.

Transmission System

Parts of the City's water transmission and distribution system are over 100 years old. Most of the older pipes are made of cast iron. Other pipes are made of asbestos cement (located primarily in the Laguna Lake area), ductile iron or, since the mid-1970's, PVC. Water pipes serve two basic functions. The larger pipes or transmission mains move large volumes of water from one portion of the City to another. They range in size from 12 inches to 30 inches. The smaller pipes or distribution mains are to distribute water within a local area and deliver it to each property in the City. They range in size from 6 inches (in the older portions of the City) to 12 inches. The current minimum standard is 8 inches for distribution mains.

Treated water from the City's water treatment plant is divided into two separate pressure zones before leaving the plant site. The transfer pump station located on the water treatment plant site pumps approximately 50% of the water into the high pressure zone that provides water to Stenner Canyon Reservoir, Cal Poly, and other portions of the City, generally north and east of the Union Pacific Railroad tracks. The other portion of water flows by gravity to the lower pressure zone areas of the City.

Pressure Zones

The water delivered from the treatment plant is split into two main distribution networks. About 50% flows into the City by gravity and the other 50% is pumped to a storage reservoir at a higher elevation and then flows into the various service areas by gravity and through pressure reducing valves (PRV's). The most apparent strain is in the pumped delivery system. Since electrical power for pumping water is a major expense, a goal is to develop a system which minimizes pumping. The goal of the water supply system is to deliver water at pressures

between 40 pounds per square inch and 80 pounds per square inch at the customer's meter without using a pressure reducing valve on the pipe connecting the water main to the meter. This pressure range will meet the needs of most irrigation sprinklers and other uses, and provide adequate pressure for fire sprinkler systems. Pressure zones are established in the distribution system to maintain these pressure ranges. The City currently has 16 pressure zones divided between the gravity and pumped delivery systems.

Fire Department Overview

San Luis Obispo City Fire Department currently protects a population of approximately 45,000 people; however that number increases to over 75,000 during the daytime hours as we are also the county seat. Our department also provides fire protection for California Poly State University (Cal Poly) which adds an additional 20,000 people to our population. We provide services for everything from EMS to structural firefighting, from wildland/WUI fires to structural collapse, and from earthquakes to explosions or terrorist activities. San Luis Obispo is the largest community neighboring the Diablo Canyon Nuclear Power Plant and provides mutual aid to the plant during emergencies.

The emergency response program protects life and property by responding to medical emergencies, fires, hazardous materials incidents, and other emergencies. Program goals are timely responses to emergency calls (4 minutes for fire suppression and for medical responses), no loss of life from reported emergencies and minimal property damage from reported emergencies.

Fire Station One

(2160 Santa Barbara Avenue) The newest firehouse in the city, Fire Station One at Broad and South Streets, and designed to support the Fire Department into the next century, the facility cost about $3.2 million. It houses the administrative offices, the Fire Prevention Bureau, and the department's maintenance shop with one mechanic, as well as emergency response vehicles. The station is staffed by a Battalion Chief and a 4-person paramedic truck company. Truck 1 is a 2010 Pierce 1500 GPM Quint with a 100 foot aerial ladder. Station 1 also houses a second line 1993 Pierce 1500 GPM Quint with a 75 foot ladder, Patrol 1, a 2007 Ford F-550 4X4 Type-4 Patrol, and Squad 1, a 1998 Ford E450 Wheeled Coach Emergency Patient Transport.

Fire Station Two

(126 No. Chorro) This is the oldest station, built in 1954. The station is staffed with a 3-person paramedic engine company. Engine 2 is a 2000 Pierce Lance 1500 GPM Triple-combination pumper. Station 2 also house OES 271, a State owned 2000 KME Westates Type-2 heavy rescue engine.

Fire Station Three

(1280 Laurel Lane) Completed in 1960 to cover growth at the south end of the city, Station 3 is located at the corner of Laurel Lane and Augusta Street. The station is staffed by a 3-person paramedic engine company. Engine 3 is a 2003 Pierce Lance 1500 GPM Triple-combination pumper. Station 3 also houses Engine 5, a 1991 Pierce Javelin 1500 GPM Triple-combination pumper (reserve).

Fire Station Four

(1395 Madonna Road) Constructed in 1978, Fire Station Number Four is located at the intersection of Madonna Road and Los Osos Valley Road. The station is staffed by a 3-person paramedic engine company. Engine 4 is a 1997 Pierce Lance 1500 GPM Triple-combination pumper. Station 4 also houses Engine 6, a 2007 Westmark Type 3 1000 GPM 4X4 Wildland Unit.

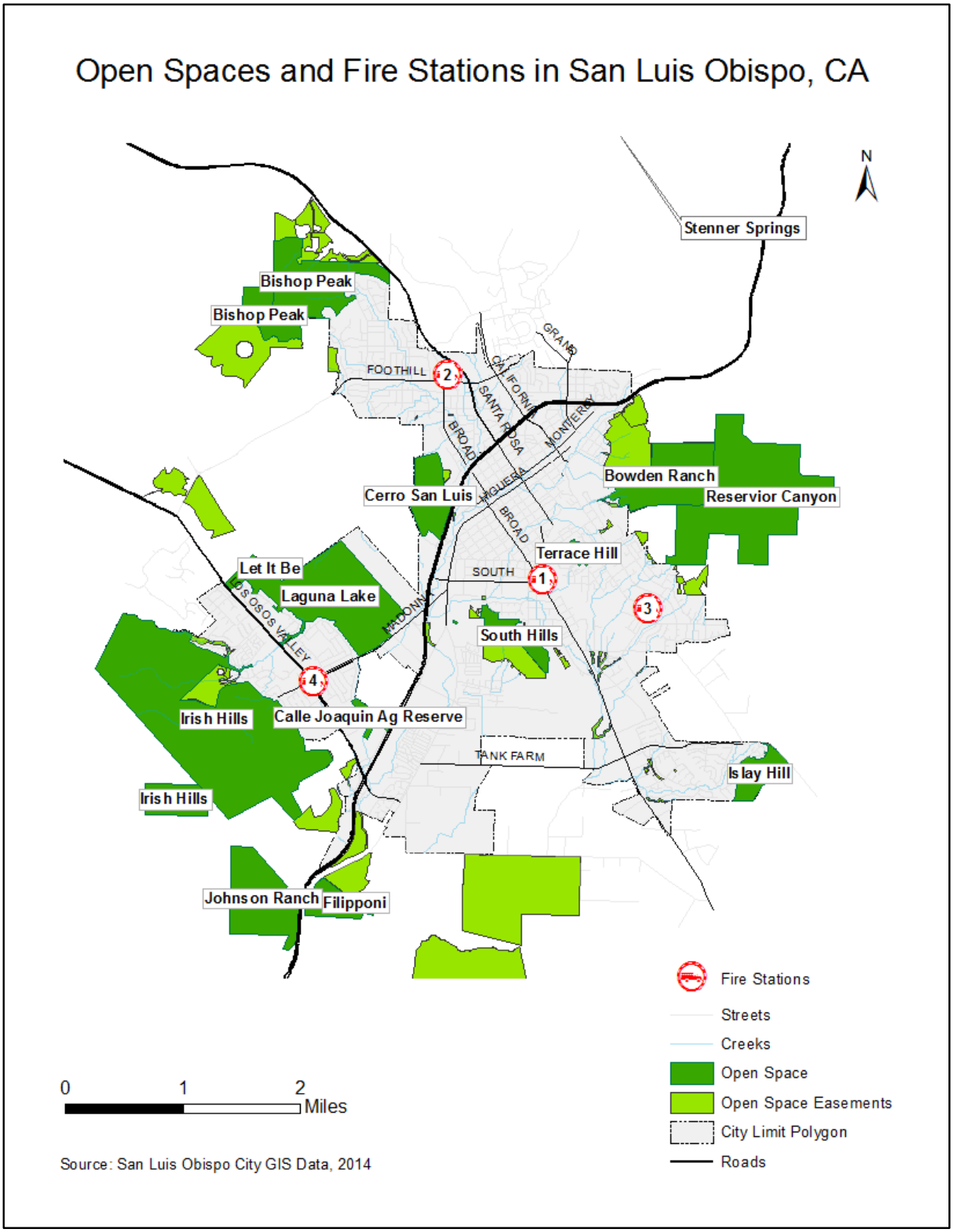


Figure 1. Open Spaces and Fire Stations in San Luis Obispo, CA.

Mutual and Automatic Aid Agreements

There is an automatic aid agreement with CAL Fire that whichever agency is closest to the incident with available resources will respond, regardless if it is in city owned property or not. Any Open Space areas that are adjacent to the State Responsibility Area (SRA) is located in a Mutual Threat Zone; therefore, CAL Fire will also commit the resources to protect the area. The "State Responsibility Area" is an area where the State of California is financially responsible for prevention and suppression of wildfires.

Values at Risk

Open Space

The Open Space Properties that are addressed in this plan are as follows:

- Johnson Ranch
- Cerro San Luis
- Terrace Hill
- Irish Hills
- Laguna Lake
- South Hills
- Bishop Peak
- Reservoir Canyon Natural Reserve
    - Reservoir Canyon
    - Bowden Ranch
- Stenner Springs

Historical Data

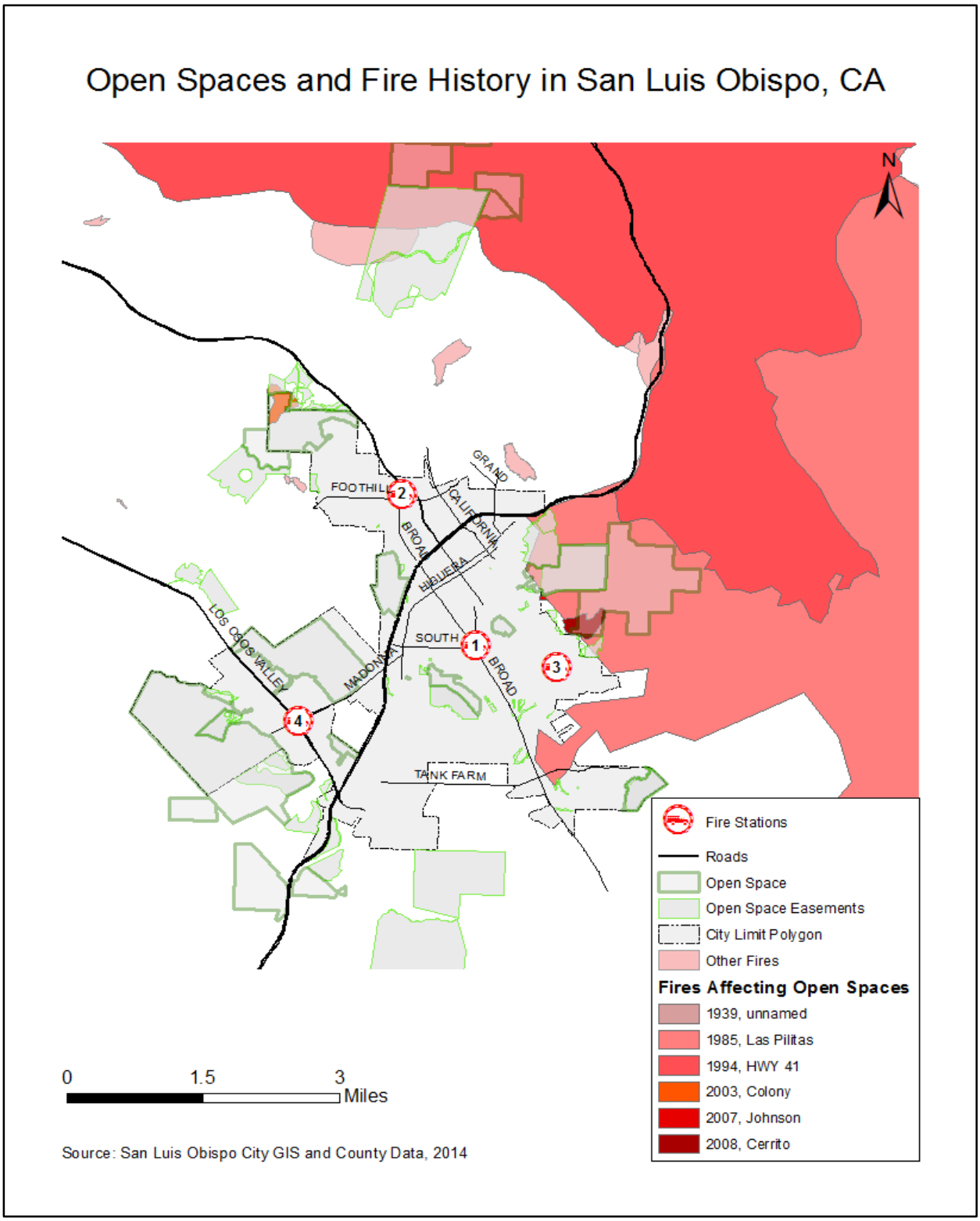


Figure 2. Open Spaces and Fire History in San Luis Obispo, CA.

Description of the shape file:

> CAL FIRE, USDA Forest Service Region 5, BLM, NPS, Contract Counties and other agencies jointly maintain a comprehensive fire perimeter GIS layer for public and private lands throughout the state. The data covers fires back to 1878. For the National Park Service, Bureau of Land Management, and US Forest Service, fires of 10 acres and greater are reported. For CAL FIRE, timber fires greater than 10 acres, brush fires, fires greater than 50 acres, grass fires greater than 300 acres, and fires that destroy three or more residential dwellings or commercial structures are reported. (CAL FIRE, 2013)

Open Space properties that were affected by these fires reported:

- Bowden Ranch
  - Johnson, 2007
  - Las Pilitas, 1985
- Reservoir Canyon
  - Las Pilitas, 1985
  - Cerrito, 2008
  - HWY 41, 1994 approached Reservoir Canyon
- Stenner Springs
  - Un-named, 1939
  - HWY 41, 1994
- Bishop Peak
  - Colony, 2003

NOTE: There have been other fires in the open space areas, but not reported on this GIS file due to their small size. A few of these fires were noted in the update to the San Luis Obispo Local Hazard Mitigation Plan. They were the Bishop Peak Fire, which took place in July of 2013 and was a "1 acre brush fire near Bishop Peak in San Luis Obispo" (City of San Luis Obispo, 2014, p. 38). Another fire that occurred near open space areas was the Bowden Ranch Fire on August 27, 2013, described as a "small brush fire in San Luis Obispo" (City of San Luis Obispo, 2014, p. 38).

Fire Hazard Severity Zones

Fire Hazard Severity Zones are determined by CAL Fire. They were obtained from San Luis Obispo County GIS Data, and are given a ranking of Moderate, High, or Very High Severity. In wildfire preparedness, a "hazard refers to a fuel complex defined by its volume, type, condition, arrangement, and location" (Blonski, Miller, & Rice, 2007, p. 7). Figure 3 shows a map of Fire Hazard Severity Zones in San Luis Obispo, and their proximity to Open Spaces.

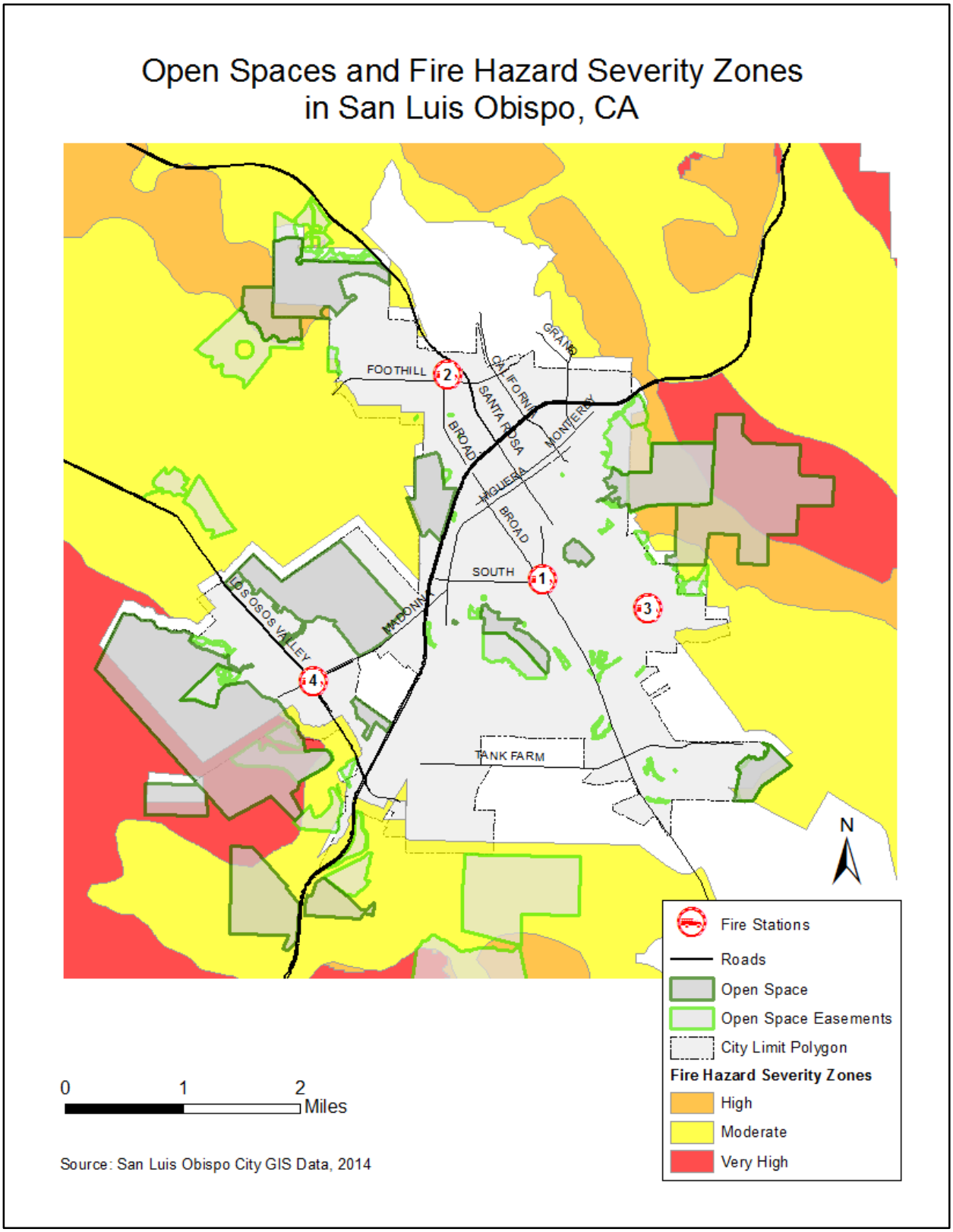


Figure 3. Open Spaces and Fire Hazard Severity Zones in San Luis Obispo, CA.

Open Space Areas with Very High Fire Hazard Severity Zones:

- Irish Hills
- Johnson Ranch
- Reservoir Canyon
- Bowden Ranch
- Stenner Springs

Open Space Areas with High Fire Hazard Severity Zones:

- Bishop Peak
- Bowden Ranch
- Reservoir Canyon

Open Space Areas with Moderate Fire Hazard Severity Zones:

- Johnson Ranch
- Reservoir Canyon
- Stenner Springs
- Boarder of Bishop Peak
- Boarder of Cerro San Luis
- Boarder of Laguna Lake, however there is no overlap

Open Space Areas not located in Fire Hazard Severity Zones:

- Terrace Hill
- South Hills
- Laguna Lake

PRE-FIRE MANAGEMENT STRATEGIES AND TACTICS

Pre-fire Planning

There are multiple fire management strategies and tactics available for wildfire prevention and preparedness, such as providing adequate staffing and resources, requiring homeowners to have defensible space, and fuel or vegetation management. Some pre-fire management strategies that are going to be addressed and potentially used as projects are:

- Manual/Hand Labor
- Tree Removal
- Mechanical
- Prescribed Burning
- Grazing
- Chemical Treatment

Vegetation management is not a one-size-fits-all, and the procedure used at each location will vary. In order to determine the best management practice for each open space, there will be numerous factors to consider.

In *Managing Fire in the Wildland Interface* by Blonski, Miller, & Rice (2010), there are several vegetation management techniques explained, including average costs, limitations, and advantages and disadvantages:

Manual/Hand labor

Skilled laborers prune, cut, or remove weeds or shrubs by hand or manual tools, such as a weed whip, "weed wrench," or chain saws, for example. This method is slow, yet selective, and is useful for small-scale sites. It is best used in spot applications and areas with sensitive environmental concerns. The timing can be staggered throughout the growing season, and some limiting factors such as poison oak or availability of labor should be taken into consideration. Some advantages are: it can be selective; it is possible to execute in most conditions; it is quiet; and there is the least amount of soil disturbance. Some disadvantages are that this method is expensive, slow, short term, and can be difficult to schedule. The cost can vary from $10,000 to $1,500 per acre, depending on the timing, size of the project, and level of specificity required.

Tree removal

Tree removal can vary from individual trees to removal of an entire overstory. This process can be selective with limited impacts, and also generates considerable debris that should be removed or sold commercially. Some limiting factors to consider are the social and political acceptance of tree removal, the topography of the area, and slope stability. Advantages of tree removal include: selectiveness, reducing of spotting

potential, cost effectiveness, and potential commercial value. Disadvantages of tree removal are: expense, follow-up treatment and removal of debris, potentially restricting physical conditions, and erosion potential. Lastly, the cost can be approximately $3,000-5,000 per acre.

Mechanical

Mechanical treatments, such as grading, chipping, mowing, involve the "removal of weeds, shrubs, and small trees with use of tractor or other machinery" (p. 343). This method is ideal for larger areas or for fuel breaks and is often used with other techniques and are usually maintained annually. Cost is about $500 per day with a contracted service and can modify one-half acre an hour. Some limitations are that mechanical treatments cannot be used on slopes over 30%, the machines can be hard to maneuver or be selective, the equipment can weigh up to 20 tons and cannot be used on unstable soils, and there is a concern for the distribution of exotic species. Advantages of mechanical treatments: some species may benefit from mowing, this process can be efficient in larger flat areas, it can be effective in poison oak, there are minimal health concerns, it is a relatively fast process, and it can be an appropriate roadside treatment. Some disadvantages are: grading can shift natural soil profiles, mowing or disking may disturb ground nesting birds or burrowing animals, there is a required scheduling and supervising process, the effects are generally short term machinery is not suitable for steep terrain, and there are considerable maintenance, noise, and access issues associated with the equipment.

Prescribed Burning

Prescribed burning is "reintroducing fire into the ecosystem," which reduces overall volume, increases moisture of remaining fuel by removing dead and dry material, reduces fuel bed height, and changes structure through vertical and horizontal separation (p. 345). There are a number of steps that need to be taken before a prescribed burn can be performed, such as coordinating with regulating agencies, obtaining approval and permits, and notifying the surrounding community and public agencies. Prescribed burning is most effective in certain vegetation such as grasslands, Eucalyptus groves, or oak woodland, and timing is critical due to weather constrictions. It is the "fasted, most thorough, and can be the least expensive method of removing fuel from an area" (p.345). Some advantages addressed are: that it is cost effective, it supports plants that have adapted to fire, it promotes new growth, it creates a natural-appearing boundary, it can be relatively quiet with minimal soil disturbance, it is effective in steep terrain or overstory, and it can release nutrients. Potential disadvantages of prescribed burning are: prescribed burning can be politically or socially unpopular, there is a minimum size of five acres, there is a risk of escaped fire, it requires extensive preparation, expertise, scheduling, equipment, coordination, and supervision, there are health considerations from smoke and poison oak, and there are short term visual impacts.

Grazing

Grazing is the "intentional use of animals to consume vegetation, thus reducing the amount or density of fuel," is usually done through private contract or lease arrangements, and it can occur approximately once every three years or two successive years out of six (p. 346). Grazing is ideal for grass or shrub areas, and the costs can vary from $300 to $1,000 per acre. Some things to consider would be the foraging preferences of the animals, fencing, water sources, predators, availability of livestock, protection of certain plant species, and public safety. Some advantages are: it is a historical land use, minimal health concerns are involved, it is quiet, can be used in areas with overstory, there is potential for revenue, and it is an excellent tool for grasslands. Disadvantages of grazing are: availability of livestock, environmental concerns for soil erosion, sensitive species, and water quality, livestock do not necessarily eat all undesirable plants, there is sometimes a strong odor associated, it requires a specialized management, and there can be some visual impacts.

Chemical Treatment

Vegetation can be killed or reduced through chemical treatment in limited areas, however, public health and environmental concerns have limited the use of these treatments. Some techniques include: chemicals that prevent germination of seeds and kill sprouted plants for firebreaks and roadside treatments; Roundup and Garlon 4-a for eradication of eucalyptus resprouting; Foliar application with Roundup of French Broom and Eucalyptus resprouts; and roadside spraying in areas of high ignition risk. Although it can be fairly inexpensive, the repetition required makes this process costly. Additionally, other limiting factors include: environmental sensitivity; timing; and effectiveness. Advantages of chemical treatment: the process is selective if done by hand; can be done in most physical conditions, such as wet ground and steep slopes; it is relatively quiet and quick; and there are minimal soil or erosion impacts. Some disadvantages: environmental and political sensitivity; expense; it requires follow up treatment; there are potential health hazards to the applicator, residents, and visitors; environmental damage to plants, wildlife, soil, water; timing; and government requirements.

Other necessary pre-fire planning techniques that should be utilized for pre-fire planning is fire prevention information and education of residents and people who use the open space property. This is especially important due to the risk of human-caused ignition, as well as to maintain trust and communication with residents when performing certain vegetation management techniques. This can be done through signage at the open space property, as well as through focused outreach activities with local residents.

Statutes and Regulations

There a few statutes and regulations that pertain to vegetation management in the City of San Luis Obispo. There is the Municipal Code on Weed Abatement, the Conservation/Open Space Zoning Code, and the Public Resources Code Section 4291 regarding defensible space.

The City of San Luis Obispo's weed abatement program is written in Municipal Code 8.8: Hazardous Weeds and Debris, subsection "08.020 Nuisance declared – permitting accumulation of weeds and debris unlawful – permission required to burn weeds or debris," which states that "all weeds growing upon private property or streets in the city and all debris on private property or streets in the city are public nuisances. (City of San Luis Obispo, 2014). This makes the property owner responsible for removal of weeds and debris, which can be enforced by the City.

In the City of San Luis Obispo Zoning Regulations, "Chapter 17.32: Conservation/Open Space (C/OS) Zone" states that the purpose of the conservation and open space zone "is intended to prevent exposure of urban development to unacceptable risks posed by natural hazards and to protect natural resources from disruptive alterations" (City of San Luis Obispo, 2010, p. 96). Therefore, it is City responsibility to address potential fire hazards, and protect natural resources from damages.

Public Resources Code (PRC) Section 4291 – "Clearance around Structures" is about defensible space, which states:

> "Any person that owns, leases, controls, operates, or maintains any building or structure in, upon, or adjoining any mountainous area of forest-covered lands, brush-covered lands, or grass-covered lands, or any land which is covered with flammable material, shall at all times:
> (a) Maintain around and adjacent to such building or structure, a fire break made by removing and clearing away, for a distance of not less than 30 feet on each side thereof or to the property line, whichever is nearer, all flammable vegetation or other combustible growth. This subdivision does not apply to single specimens of trees, ornamental shrubbery, or similar plants which are used as ground cover, if they do not form a means of rapidly transmitting fire from the native growth to any building or structure.
> (b) Maintain around and adjacent to any such building or structure, additional fire protection or fire break made by removing all brush, flammable vegetation, or combustible growth which is located from 30 feet to 100 feet from such building or structure or to the property line, whichever is nearer, as may be required by the director if he finds that, because of extra hazardous conditions, a fuel break of only 30 feet from such building or structure is not sufficient to provide reasonable fire and life safety. Grass and other vegetation located more than 30 feet and less than 18 inches in height above the ground may be maintained where necessary to stabilize the soil and prevent erosion.

(c) Remove that portion of any tree which extends within 10 feet of the outlet of any chimney or stovepipe.
(d) Maintain any tree adjacent to or overhanging any building free of dead or dying wood.
(e) Maintain the roof of any structure free of leaves, needles, or other dead vegetative growth.
(f) Provide and maintain at all times a screen over the outlet of every chimney or stovepipe that is attached to any fireplace, stove, or other device that burns any solid or liquid fuel. The screen shall be constructed of nonflammable material with openings of not more than one-half inch in size.
(g) The director may adopt regulations exempting structures with exteriors constructed entirely of nonflammable materials, or conditioned upon the contents and composition of same, he may vary the requirements respecting the removing or clearing away of flammable vegetation or other combustible growth with respect to the area surrounding said structures.
No such exemption or variance shall apply unless and until the occupant thereof, files with the department, in such form as the director shall prescribe a written consent to the inspection of the interior and contents of such structure to ascertain whether the provisions hereof and the regulations adopted hereunder are complied with at all times" (California Department of Forestry and Fire Protection, 2000).

This code is enforced in the City, specifically near Open Space areas that are a fire hazard.

OPEN SPACES AND PROJECT DESCRIPTIONS

Context

There are 12 large Open Space lands totaling about 4,000 acres, as well as additional conservation easements, all operated by the City. Each Open Space property in San Luis Obispo is unique, with various topography, vegetation, and access points. For each Open Space, there is a description of the following:

- General Description
    - Location
    - Fuel/Vegetation
    - Topography
- Assets at Risk/Structures
- Access
- Water Supply
- Evacuation Routes
- Predominant Risk Exposure
- Pre-Fire Plan and Proposed Projects with a Priority Ranking

Background information was collected from existing Open Space Conservation Plans, San Luis Obispo City and County GIS Data, and collaboration with the City Fire Marshall and Natural Resources Manager.

Vegetation

Vegetation for each Open Space was analyzed based upon GIS Data from the City and from Open Space Conservation Plans.

GIS Data from the City of San Luis Obispo was utilized to determine the vegetation. This data is more detailed than the County GIS Vegetation Data, and contains the following Types and (Categories):

1. Bay-Oak Woodland
2. Cactus Scrub
3. Chaparral
4. Coastal Sage Scrub (Scrub Habitats)
5. Cultivated Crops
6. Eucalyptus Woodland
7. Freshwater Marsh
8. Non-native Grassland
9. Oak Riparian
10. Oak Woodland (Woodland Habitats)
11. Oak-Sycamore-Bay Riparian

12. Open Water
13. Other Mixed Riparian
14. Potential Wetland
15. Ruderal (Agricultural/Disturbed Habitats)
16. Seasonal Wetland
17. Serpentine Chaparral (Grassland Habitats)
18. Serpentine Coastal Sage Scrub
19. Serpentine Grassland (Grassland Habitats)
20. Sycamore Riparian
21. Urban Area Dominated By Buildings or Paving (Developed Habitats)
22. Urban Area Dominated by Tree Canopy, Landscaping
23. Willow Riparian
24. Willow-Sycamore Riparian

There were a few discrepancies in the GIS data and consistency between the City Data and a few of the approved Conservation Plans, and those discrepancies are addressed in Appendix B.

Some portions of Stenner Springs Open Space did not have data from the City Vegetation data, therefore the County GIS Vegetation data was used. Additionally, information was derived from the Stenner Springs Natural Reserve Draft Conservation Plan. For the County GIS Vegetation data that was used, the description of the shape file, titled "PLN_VEG_SLOCO_2007," states that it was created in 2008 to provide a "baseline structural vegetation map and oak survey for the entire county" and adheres to the "National Vegetation Classification System" (County of San Luis Obispo, 2008).

Assets at Risk and Structures

Assets at risk can be structural or biological. For each open space, there are assets potentially at risk, including infrastructure such as houses, water tanks, and power lines. There could also be rare or endangered species or vegetation, scenic views, or recreation areas that are considered assets in the area.

Access

This section is based on routes to trailheads and any dirt, paved, or graded access road that is on or near the open space property which can be used for maintenance or emergency purposes.

Water Supply

Water supply is based on access to fire hydrants near the open space properties and any bodies of water that could be utilized in firefighting.

Predominant Risk Exposure

A fire risk is the chance of a fire starting, based upon "the presence and activity of causative agents" (Blonski, Miller, & Rice, 2007, p. 360). Risks of fire can be natural, such as lightening, or man-made, such as from cigarettes or machinery sparking.

Wildfire Preparedness Plan

This section restates the Fire Hazard Severity Zone for the property. It also addresses the projects currently occurring in the Open Spaces as outlined in the Conservation Plans, or projects that could take place in the future to manage vegetation and reduce fire hazard on the property. Furthermore, it lists potential future considerations for vegetation management. It then gives a priority ranking, described below.

Priority Ranking Criteria

Each Open Space is given a Priority Ranking of High, Medium, or Low, based upon evaluation of particular characteristics. The following criteria are taken into account:

- Vegetation
- Topography
- Assets
- Fire history
- Probability of future events

JOHNSON RANCH

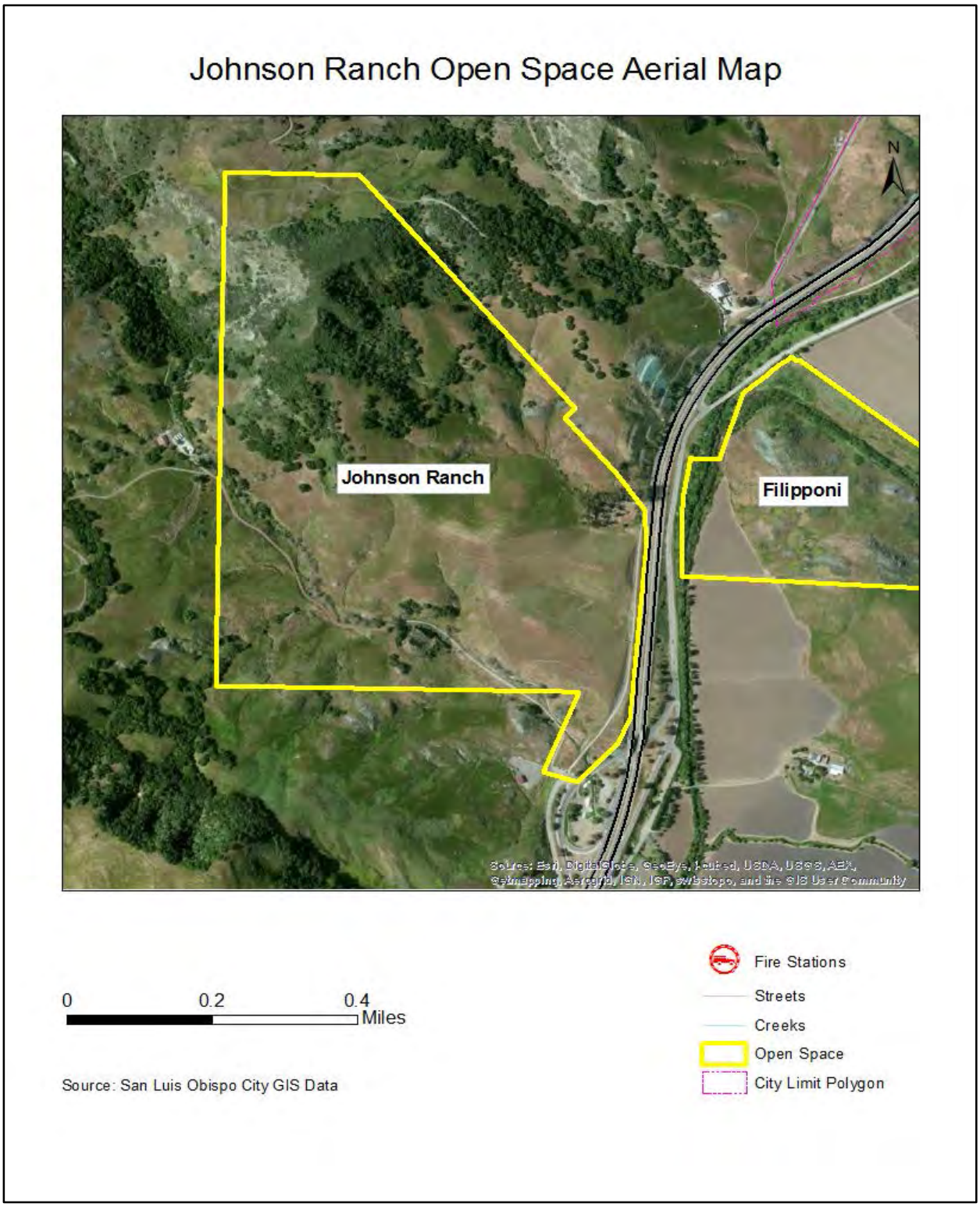


Figure 4. Johnson Ranch Aerial Map.

Description

Location

Johnson Ranch is 242 acres, and is located about 1.5 miles south of the City of San Luis Obispo on the west side of US Highway 101.

Closest Fire Station: Fire Station 4

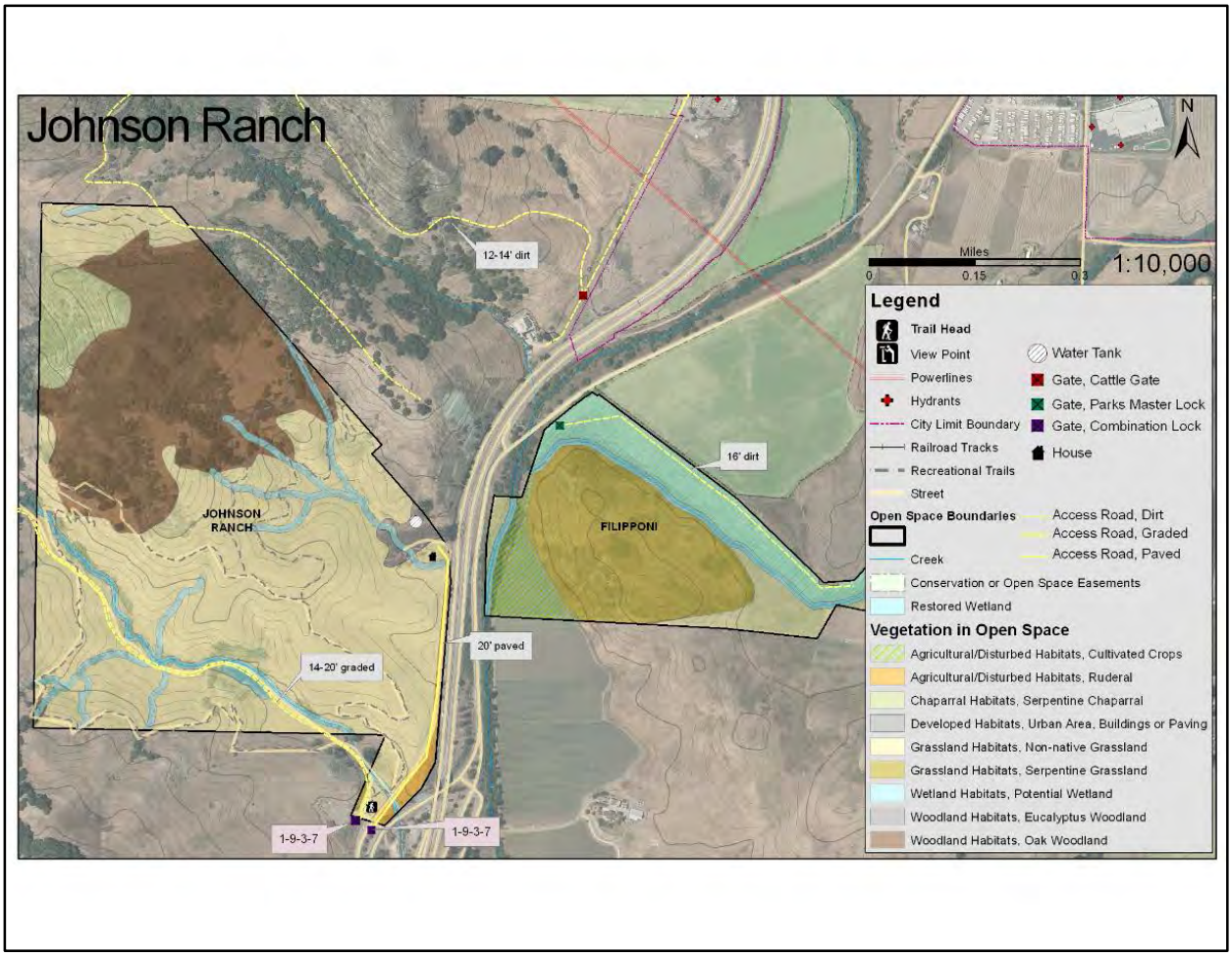


Figure 5. Johnson Ranch Map.

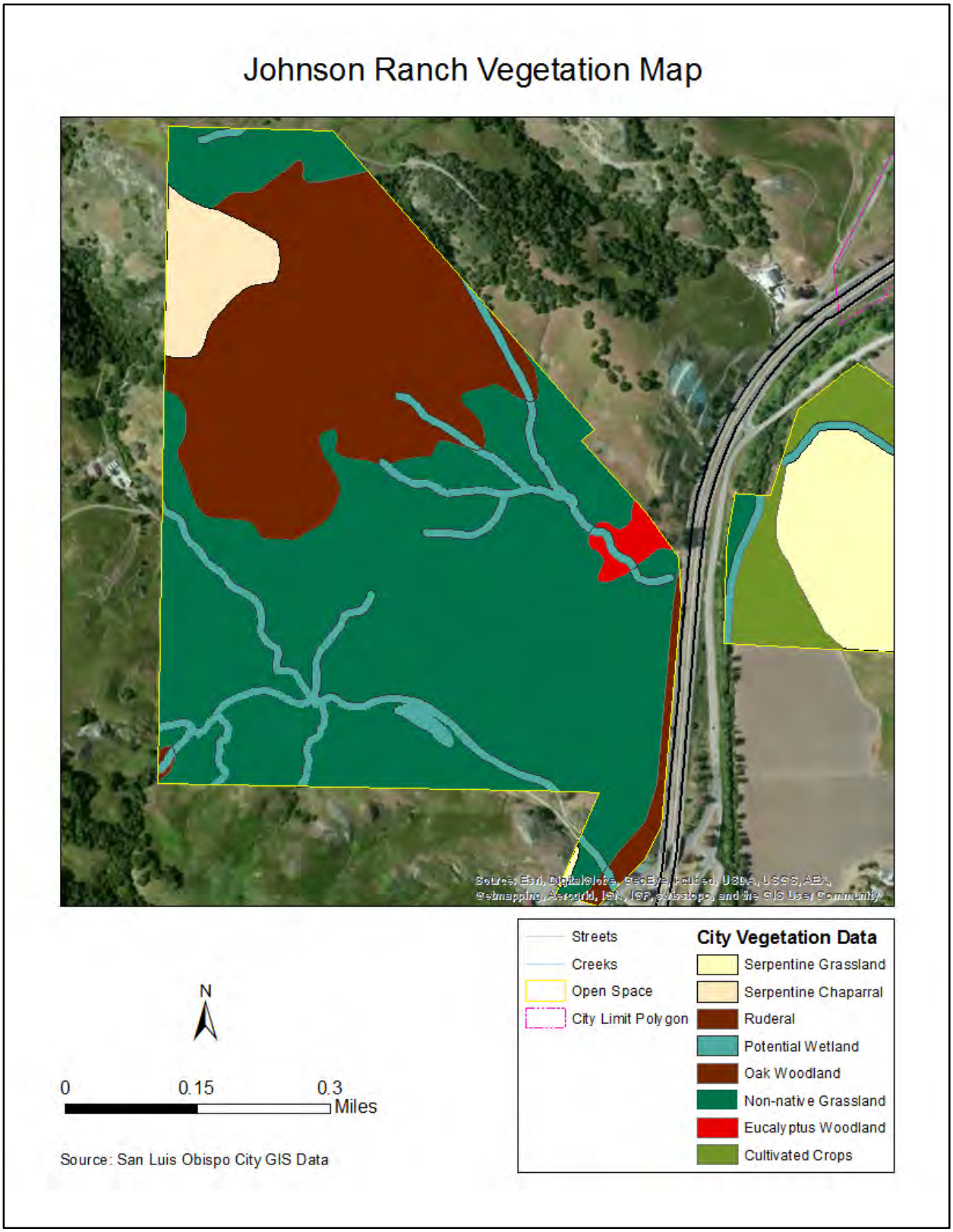


Figure 6. Johnson Ranch Vegetation Map.

Fuel/Vegetation

The vegetation in Johnson Ranch consists of Non-native Grassland, Potential Wetlands, Oak Woodland, Eucalyptus Woodland, Ruderal, Serpentine Grassland, and Serpentine Chaparral.

Oak woodland covers about 65 acres on the northern slope of the property.

A majority of the vegetation is Non-native Grassland, located north and south of the Oak Woodland. The northernmost portion is about 8.5 acres, and the rest is located to the south of the Oak Woodland, totaling about 130 acres.

Almost 10 acres of Serpentine Chaparral is found in the northwest portion of the site.

Eucalyptus Woodland is found in the eastern corner of the property and covers approximately 2 acres.

There are potential wetlands found throughout the Open Space along the creeks, concentrated in: the southwest corner covering about 9.5 acres; southeast of the Oak Woodland, totaling about 6 acres; and in the northernmost section of the property, totaling less than a half-acre.

Topography

Elevation ranges from 80 feet above sea level at the south eastern corner of the property to 761 feet above sea level atop the hill on the northern portion of the site.

Assets at Risk/Structures

- Buildings on the Johnson Ranch property:
    - five sheds
    - two barns
    - one residence

Access

The trailhead for the Johnson Ranch Open Space is located at the turnout to the intersection of South Higuera Street and Ontario Road.

There is also a 20’ wide partially paved road used to access the farmhouse on the property, which is used as a residence.

There is another 14’-20’ graded road that provides legal access to a neighboring property to the west and is part of an easement which goes along the edge of Dry Creek about 0.75 miles.

Adjacent to the northeastern part of the property is a 12’-14’ dirt road that is accessible off of the residential area through a cattle gate.

Water Supply
Water resources are limited. There is Dry Creek, which is a small stream that enters Johnson Ranch from the adjacent Miramonte Ranch on the west, and flows in a southeasterly direction for about 0.75 mile to the easterly boundary.

Evacuation Routes
The turnout to the intersection of South Higuera Street and Ontario Road to HWY 101.

Historical Data
There is no history of major fires at this open space.

Predominant Risk Exposure
This Open Space is located off of HWY 101, which is a high risk for fire started by vehicles or people.

Wildfire Preparedness Plan

Fire Hazard Severity Zone
Very High & Moderate

Current Pre-Fire Plan
The following is from the Jonson Ranch Open Space Conservation Plan:

> Due to the fact that Johnson Ranch Open Space is outside of the developed area of the City, if wildfire is to break out, the most attention would be to protecting the buildings on the property. Approximately 60% of the property is grassland and is grazed which limits the fuel available for fire, but there is chaparral located at the top of the ridge and a grove of eucalyptus trees is located adjacent to the buildings. An active fire hazard abatement program is underway around the buildings and forest litter from the eucalyptus trees is periodically removed to reduce the fuel loading in the area. Mechanical control of fires within the chaparral areas would not be undertaken, due to the steepness and relatively small size of the area. Rangeland fires can be easily contained on the boarders of the chaparral.
>
> Approximately 60% of the property is grassland and allows grazing, which is currently on a month to month lease. Cattle have access to the entire property. There are fences that are creating two pastures, and one being constructed to prevent livestock from accessing the riparian corridor. A third pasture will be established in the triangular area south of Dry Creek. Grazing will occur generally from March 1 to November 1, and adjusted as necessary due to water supply and forage conditions. (Havlik & Otte, 2008, p. 16)

Additionally, there is a tractor that mows along the US 101 Frontage.

Future Considerations

If it is ever appropriate to do a prescribed burn, this property would be optimal to consider.

Priority Ranking: High

Based upon the fact that this area is in the Very High Fire Hazard Severity Zone, hazardous vegetation such as chaparral on the property, and assets at risk, as well as potential risk from being located near the freeway, Johnson Ranch is a high priority to continue to manage. There is already an abatement program underway on the property, and forest litter is removed periodically from Eucalyptus trees. This should continue on a regular schedule.

CERRO SAN LUIS NATURAL RESERVE

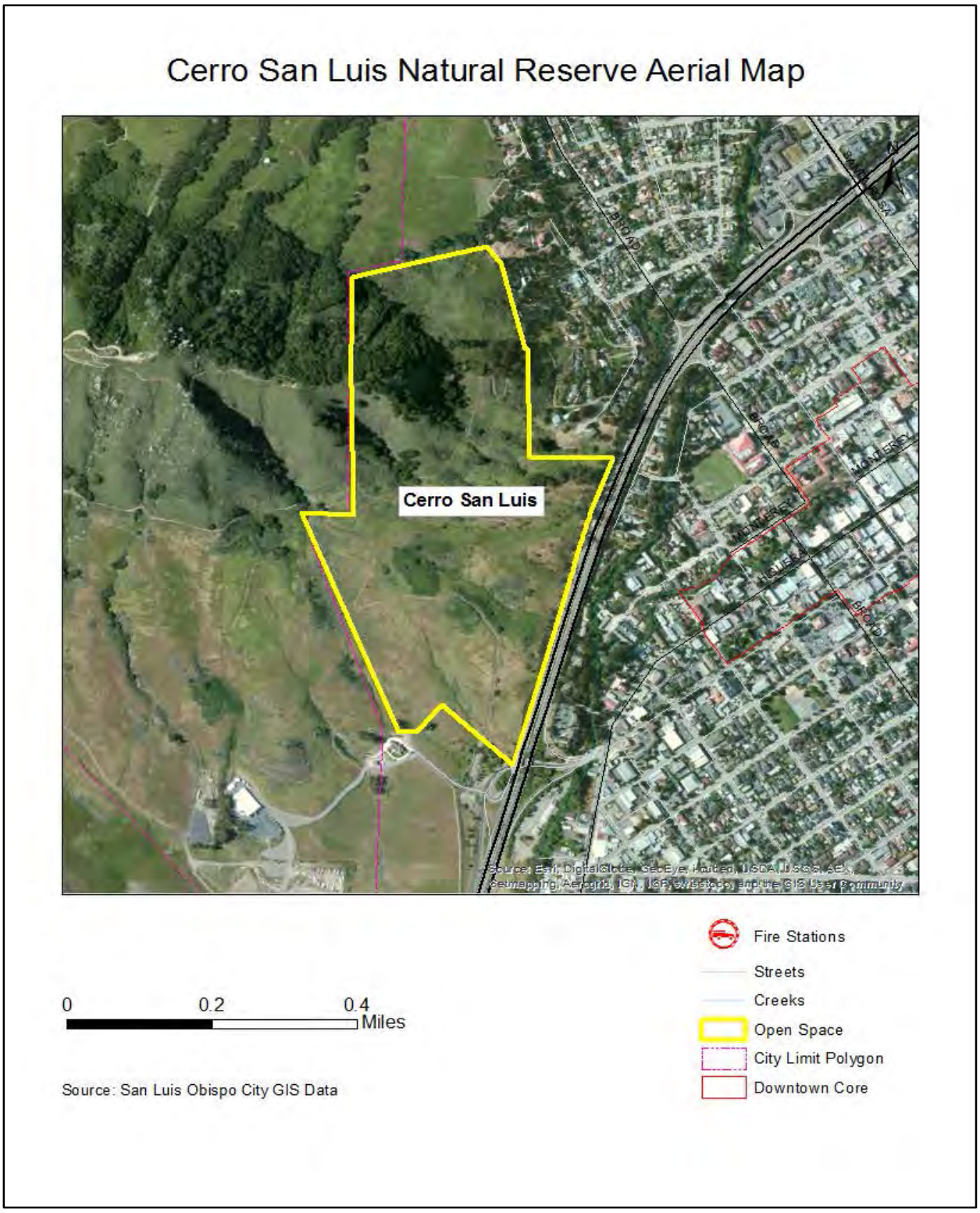


Figure 7. Cerro San Luis Aerial Map.

Description

Location

Cerro San Luis Natural Reserve is about 118 acres, north of the Marsh Street on-ramp on the Southbound US Highway 101, with US Highway 101 bordering the area to the east.

Closest Fire Station: Fire Station 2

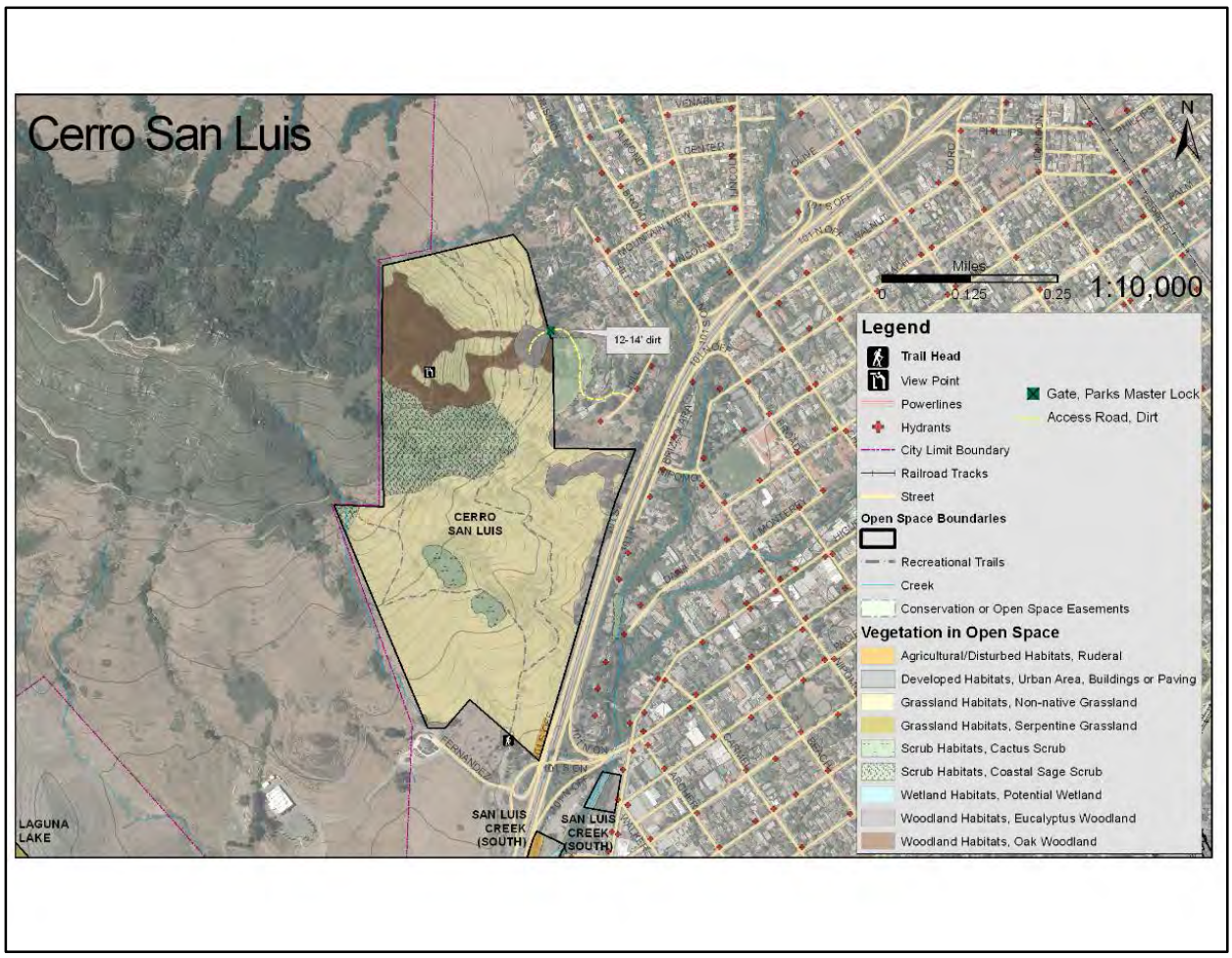


Figure 8. Cerro San Luis Map.

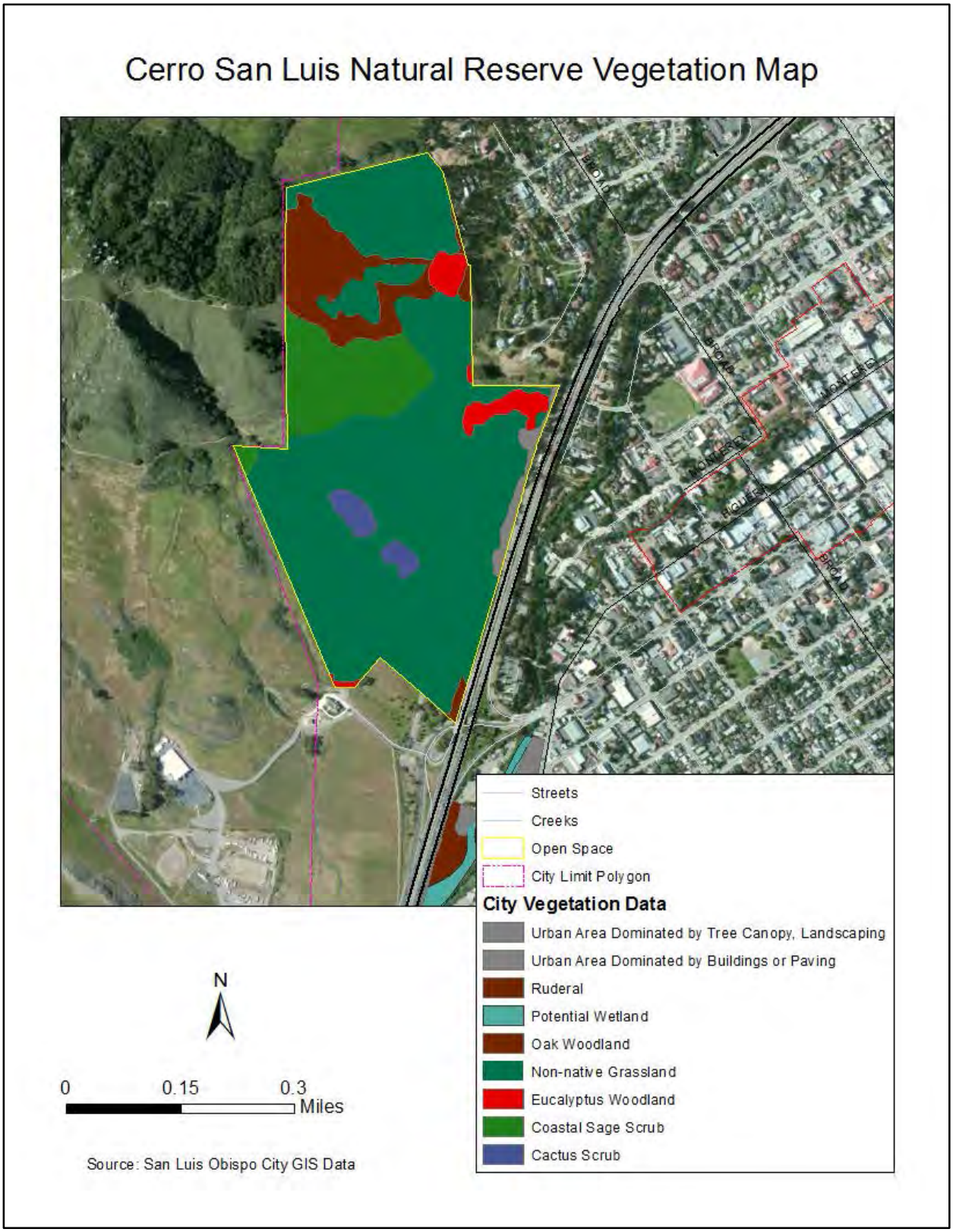


Figure 9. Cerro San Luis Vegetation Map.

Fuel/Vegetation

Mostly Non-native Grassland, covering about 76 acres on the middle and lower slopes of Cerro San Luis

Oak Woodland covers about 12 acres near the northwest boundary

About 14 acres of Coastal Sage Scrub in the northwest

A few patches of Eucalyptus Woodland on the east side and southernmost boundary, totaling approximately 4 acres

About two acres of Cactus patches.

Topography

Generally moderate to steep slopes and elevations range from about 190 feet along the US Highway 101 easement to about 920 feet along the western boundary (City of San Luis Obispo Natural Resources Protection Program, 2005).

Assets at Risk/Structures

- Sensitive Habitats: Immediately south of Cerro San Luis Natural Reserve is a roosting site for monarch butterflies.
- The "M" on the hillside facing downtown has been determined as historic or cultural significance to the community by the City's Cultural Heritage Committee.
- Two archeological sites are located on the open space.
- The northeast and eastern section is bordered by developed residential neighborhoods.
- Adjacent neighborhoods in the northwest

Access

Turn right onto Fernandez Road just before the southbound 101 Marsh Street on-ramp.

For maintenance use: there is a common driveway serving private residences at 663, 665, and 667 Hill Street. There is a 12-14' dirt access road off of Hill Street.

Water Supply

Hydrants are located at the end of Hill Street at the northeastern access.

Evacuation Routes

From the Fernandez road access point, exit from Fernandez Road onto the southbound 101 Marsh Street on-ramp.

From the southern access point of Hill Street, head North on Hill and then East on Lincoln. From the northern part of Hill Street, head south on Hill and east on Mountain View.

Historical Data
There is no history of major fires at this open space.

Predominant Risk Exposure
This area is frequented often by recreational users, increasing risk of human caused ignition. It is also located in close proximity to homes and HWY 101.

Wildfire Preparedness Plan

Fire Hazard Severity Zone
Moderate Fire Hazard Severity Zone

Current Pre-Fire Plan
As per the "Cerro San Luis Natural Reserve Conservation Plan," there are three areas designated to fire management:

> Fuel Management Area – area adjacent to the urban/wildland interface that couldn't be safely burned in a controlled manner. These areas require active pruning, mowing and/or other active management of the vegetation (including livestock grazing) to reduce fuel loads adjacent to developed properties. This includes most of the grassland areas of Cerro San Luis, and especially for the eucalyptus plantation on the easterly boundary near Hill Street. The city has an easement to access the Eucalyptus groves for thinning.
>
> Active Firefighting Area – areas acting as a buffer between the surrounding urban developments and the pristine habitat. Active firefighting techniques such as the use of heavy machinery and cutting of fuel breaks can be utilized to protect property from an advancing wildfire.
>
> These areas have also been identified because the physical resources and topography are conducive to successful restoration efforts following a wildfire.
>
> Passive (habitat sensitive) firefighting area – Areas of important wildlife habitat, mostly on steep hillsides. These areas are also somewhat removed from urban development. They are particularly sensitive to aggressive firefighting techniques such as the use of heavy machinery. Therefore, wherever practicable, firefighting strategies in these areas should be limited to low impact, habitat friendly methods. (Havlik & Clarke, 2005, p. 32).

Additionally, there is Livestock Grazing through Madonna Construction, Inc., which uses a rotational grazing system. Grazing is monitored annually and is permitted throughout the year, but the south pasture is avoided from December through February and avoided in the north pasture from December through March. (Havlik & Clarke, 2005, pp. 32-34).

Priority Ranking: High

This area is located in a Moderate Fire Hazard Severity Zone, with hazardous vegetation such as patches of eucalyptus, and there are numerous assets to protect on and near the property. However, there is continuous vegetation management through grazing and thinning that takes place, which keeps the fire hazard low. There are no proposed fire management projects for this open space, other than continuous management that is already taking place through thinning and active grazing to reduce fuel loads and continue to keep the hazards to a minimum.

TERRACE HILL

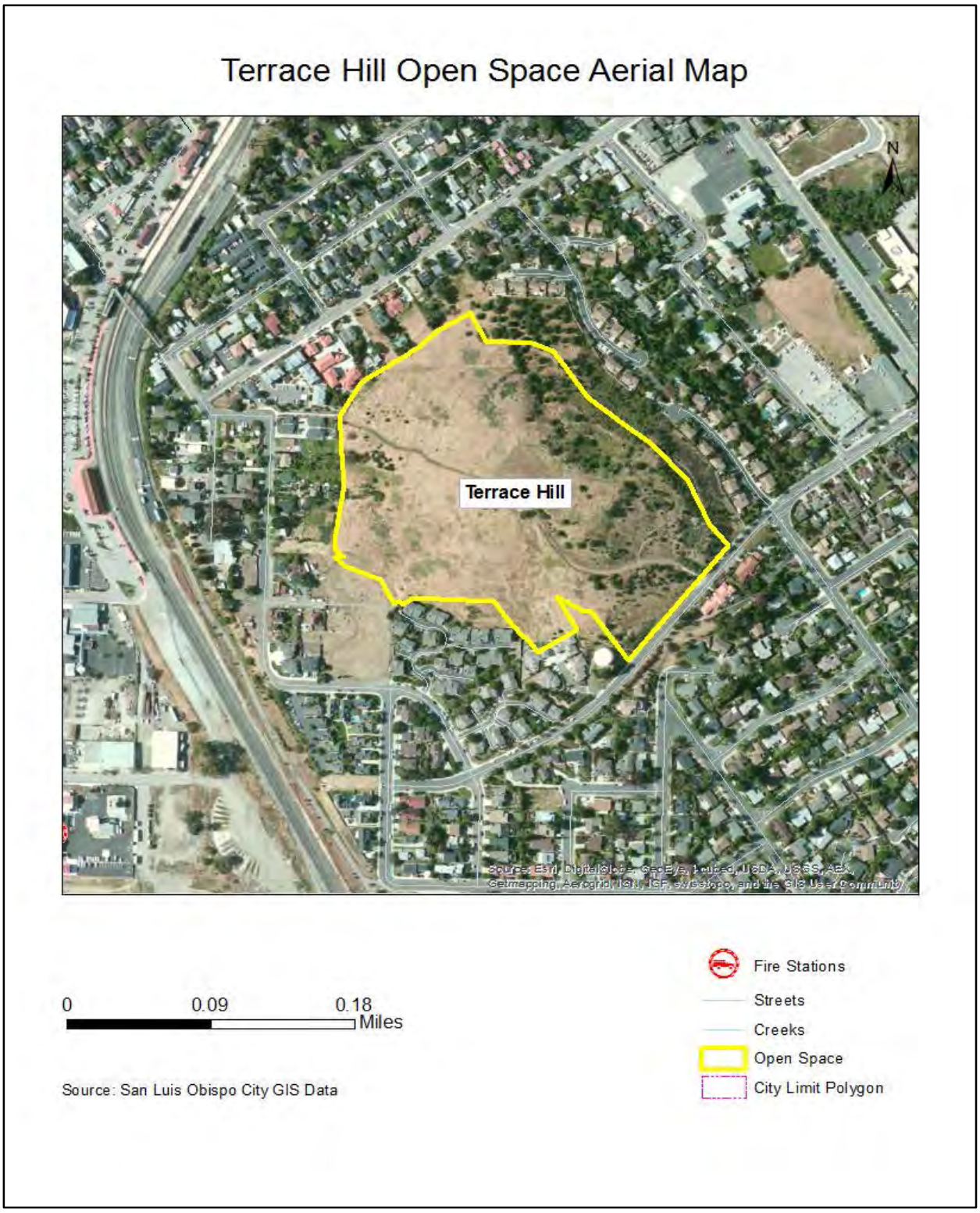


Figure 10. Terrace Hill Aerial Map.

Description

Location

Terrace Hill is 22 acres and located on the east side of the city, between the Railroad Recreation Train to the west, Johnson Avenue on the east side, Ella Street on the north side and Bishop Street on the south side.

Closest Fire Station: Fire Station 1

Figure 11. Terrace Hill Map.

Figure 12. Terrace Hill Vegetation Map.

Fuel/Vegetation
There is about 14 acres of Non-native Grassland on the west side and about 7 acres of Coastal Sage Scrub on the east side.

Topography
The elevation of Terrace Hill goes from approximately 300 ft. to 500 ft.

Assets at Risk/Structures
- The area is surrounded by residential property.
- There is also a water tank located south of the property.

Access
Trailhead is located on Bishop Street off of Johnson Avenue. There is a 16' dirt access road off of Bishop Street.

There is also limited access from Binns Court, off of Ella Street from Johnson Avenue, as well as limited access from Augusta Court north of Bishop Street off of Johnson Avenue.

Water Supply
There are fire hydrants located along Bishop Street, as well as on Binns Court and Augusta Court.

Evacuation Routes
Evacuation would be northeast on Bishop Street and south on Johnson Avenue. Also, Northeast on Ella St and North on Johnson Avenue.

Historical Data
There is no history of major fires at this open space.

Predominant Risk Exposure
Terrace Hill is surrounded by residential areas, which could pose a risk for human caused fires.

Wildfire Preparedness Plan

Fire Hazard Severity Zone
Terrace Hill is not located in a Fire Hazard Severity Zone

Current Pre-Fire Plan
- There is currently mowing on top of the hill
- There is also mowing behind housing that comes up the property
- East side of the property should be doing its own weed abatement

Future Considerations

The side slopes are at about a 30% grade, making it too steep for mowing. Potential for livestock grazing of goats or sheep, granted that a contractor would be confident the livestock wouldn't escape or if there were fencing put in place.

Priority Ranking: Low

Terrace Hill is mostly grassland and scrub, and not a high fire hazard, especially considering there is continuous mowing. This should be continued.

IRISH HILLS NATURAL RESERVE

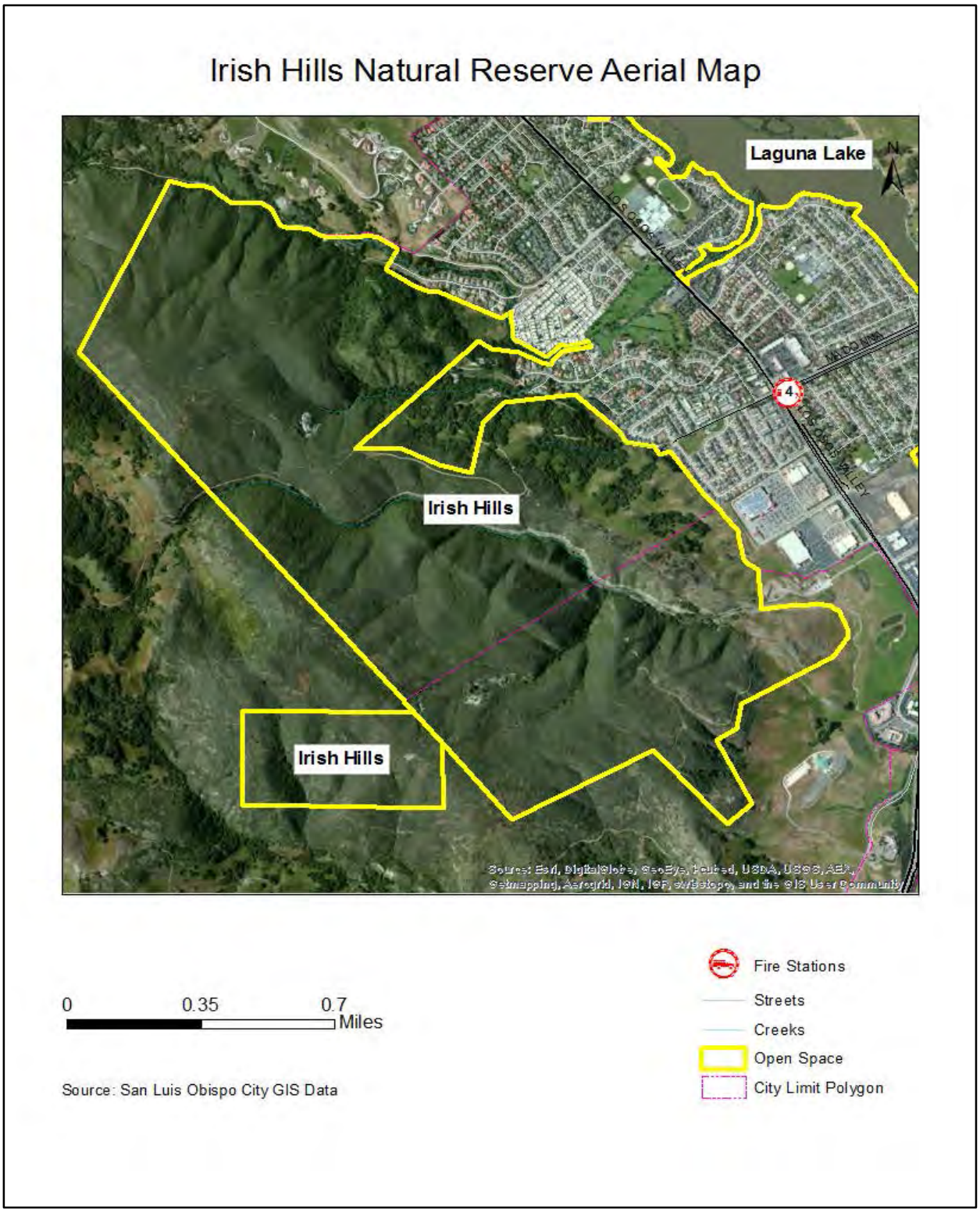


Figure 13. Irish Hills Aerial Map.

Description

Location

Irish Hills Natural Reserve is about 1,110 acres, located west of Los Osos Valley Road, south of Prefumo Canyon Road.

Closest Fire Station: Fire Station 4

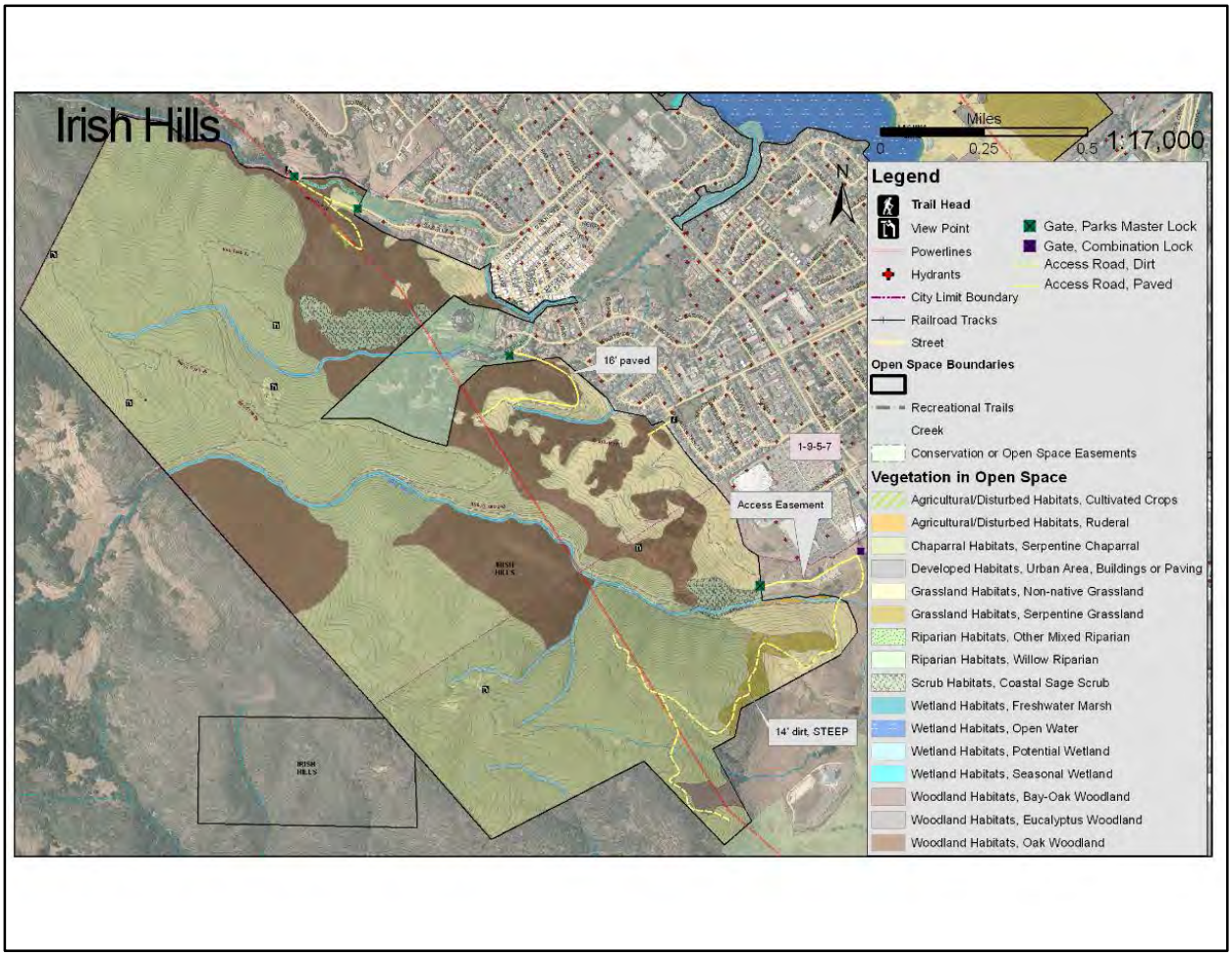


Figure 14. Irish Hills Map.

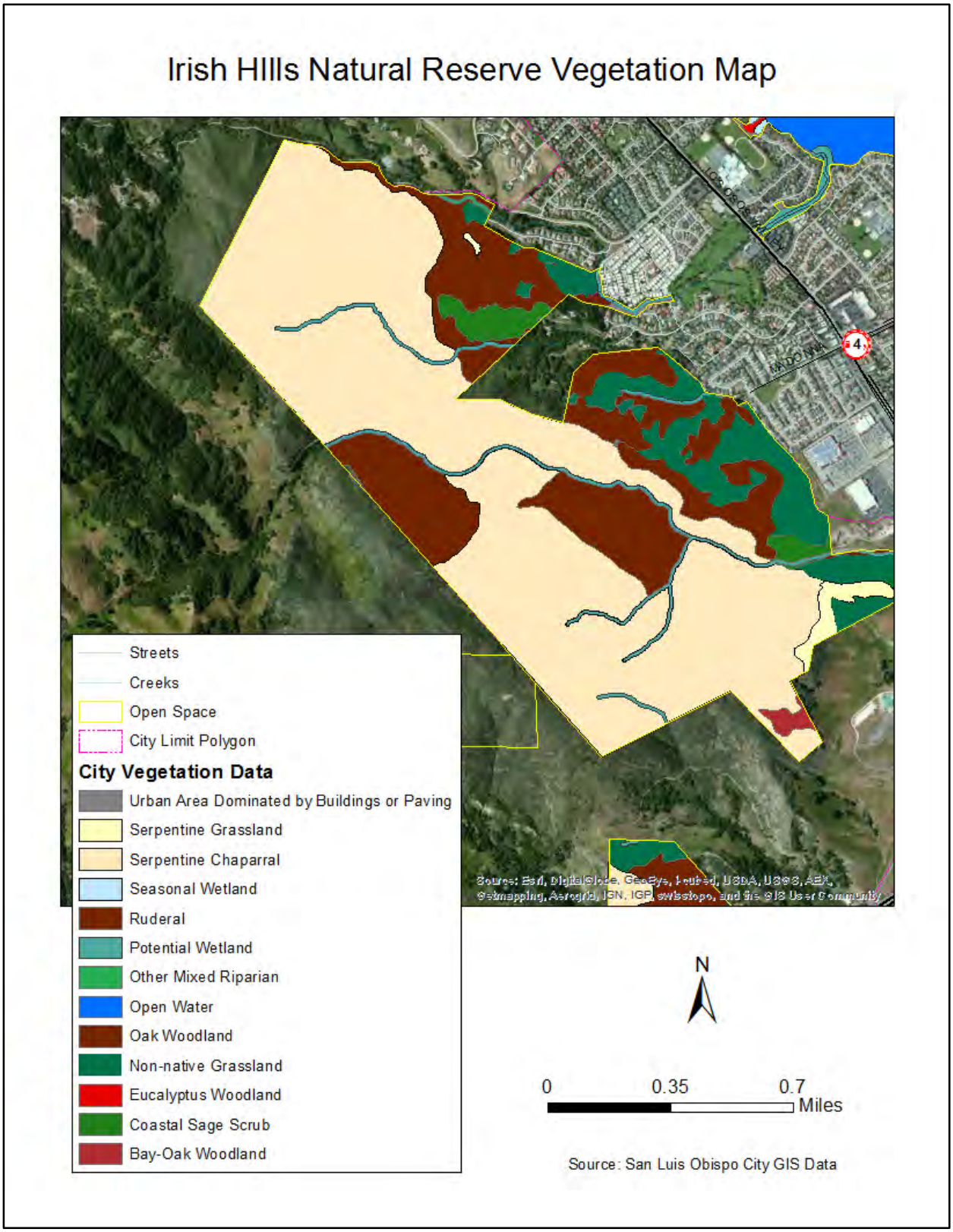


Figure 15. Irish Hills Natural Reserve Vegetation Map.

Fuel/Vegetation

A majority of the property is covered in Serpentine Chaparral, totaling about 630 acres

Oak woodland covers about 234 acres, mostly along hillsides that face north or northeast and around riparian areas.

There are about 95 acres of Non-native Grassland along the eastern boundary

There are about 13 acres of Serpentine Grassland in the southeast corner

There are also some Potential Wetland and Riparian Habitats, covering approximately 30 acres, lining the stream banks of Perfumo Creek, Froom Creek, and the tributary of Perfumo Creek which flows past Sterling Drive.

Topography

Ranging from 140 feet to a peak elevation of 1,160 feet. There are canyons along Froom Creek and Perfumo Creek.

Assets at Risk/Structures

There are important features noted in the "Irish Hills Natural Reserve Conservation Plan Update:"

Natural Features

- Threatened Steelhead trout in the two streams
- Endangered Plant Species (Chorro Creek Bog Thistle)
- Several rare plant and animal species
- Chaparral, Oak Woodland, and Grassland on Serpentine Soils
- Four former mine sites
- Large tracts of intact, high quality wildlife habitat

Built Features

- High-tension power lines and towers owned by PG&E
- Mines from the early 1900's. (Havlik, Otte, & Riley, 2011, p. 2)

Access

Prefumo Canyon Trailhead: From Highway 101, take Los Osos Valley Road north towards Los Osos. Turn left onto Prefumo Canyon Road. Follow this road for one mile and the trailhead will be on the left after and bridge crossing.

Madonna Road Trailhead: From Highway 101, take Los Osos Valley Road north towards Los Osos. Turn left on Madonna Road. Follow the street to the end. There is a 16' paved access road.

There is a paved road at the end of Sterling Drive, and it is about 14-16’ wide and about 1.2 miles long and there is a steep, unpaved stretch. This access road is in need of continuous maintenance.

There is another dirt access road at the end of Isabella Way.

There is an Access Easement on the eastern part of the property and a 14’ wide very steep dirt road past a combination lock.

Water Supply

Near Perfumo Canyon: At the end of Perfumo Canyon Drive there is a hydrant. There are also hydrants located along Isabella Way and at the end of Jane Drive.

Sterling Drive and Madonna Road Access: There is a hydrant located at the end of Sterling Drive, which leads to an access road. There is also a hydrant at the end of Royal Way, Partridge Drive, Quail Drive, and along Devaul Ranch Drive on the opposite side of the street and along the Park. There are also hydrants behind Costco and Home Depot.

Evacuation Routes

From Perfumo Canyon: Perfumo Canyon to Los Osos Valley Road, Del Rio Avenue to Perfumo Canyon to Los Osos Valley Road. Via Laguna Vista to Diablo Drive to Los Osos Valley Road.

From Sterling Drive and Madonna Road access: Exit Sterling Drive to Royal Way to Los Osos Valley Road. Exit Partridge Drive to Royal Way to Los Osos Valley Road. Exit Quail Drive to Royal Way north to Los Osos Valley Road. Exit Eto Circle to Madonna Road to Los Osos Valley or Madonna Road. Exit Spooner Drive or Madonna Road to Los Osos Valley Road of Madonna Road. Exit DeVaul Ranch to Los Osos Valley Road.

Historical Data

There is no history of major fires at this open space.

Predominant Risk Exposure

This area is very high risk, particularly due to the fact that there is hazardous fuel and no significant fire history. It is also located along multiple properties with risk of man-made fires from homes or visitors to the property.

Wildfire Preparedness Plan

Fire Hazard Severity Zone
Very High Fire Hazard Severity Zone

Current Pre-Fire Plan
As per the Irish Hills Conservation Plan, there are four areas identified for wildfire preparedness:

> Potential prescribed burning area – area that has a high load of vegetative fuel that could be reduced by burning.
>
> Fuel management area – adjacent to urban/wildland interface that will require active pruning, mowing, and/or other active management of the vegetation to reduce fuel loads adjacent to developed areas.
>
> Active firefighting area – areas acting as a buffer between the surrounding urban developments and the pristine habitat lying to the west of IHNR. Heavy machinery and cutting of fuel breaks can protect life and property from advancing wildfire.
>
> Passive (habitat sensitive) firefighting area – areas of important wildlife habitat and are somewhat removed from urban development. Strategies in these areas should be limited to low impact methods. The city will conduct annual mowing in grassland areas behind homes on Isabella, Partridge, Eto, and DeVaul Ranch Drives at width of 20-30 feet. The city will also continue to mow the meadow at the North end of Isabella Street on an annual basis as well as conduct regular brush abatement every 5+ years in the previously stated areas behind homes up to a distance of 200 feet from homes as deemed necessary. (Havlik, Otte, & Riley, 2011)

Pre-fire plan would include fuel breaks, mowing, weed-whacking and clearing brush against houses. There are also peripheral shaded fuel breaks that need to be maintained.

Future Considerations
Perfumo Creek has Scotch Broom that needs to be removed.

Priority Ranking: High
Irish Hills is the most intensive fire hazard. It has both natural and man-made assets, steep slopes, as well as hazardous vegetation on the property. This open space also does not have any fire history, which could pose a higher threat. Without property vegetation management and clearance, if there were to be a wildland fire it has potential to be much more severe.

LAGUNA LAKE

Figure 16. Laguna Lake Aerial Map.

Description

Location

Laguna Lake is about 360 acres, the entrance is at the corner of Madonna Road and Dalidio. It is north of Madonna Road, east of Laguna Middle School and west of Dalidio.

Closest Fire Station: Fire Station 4

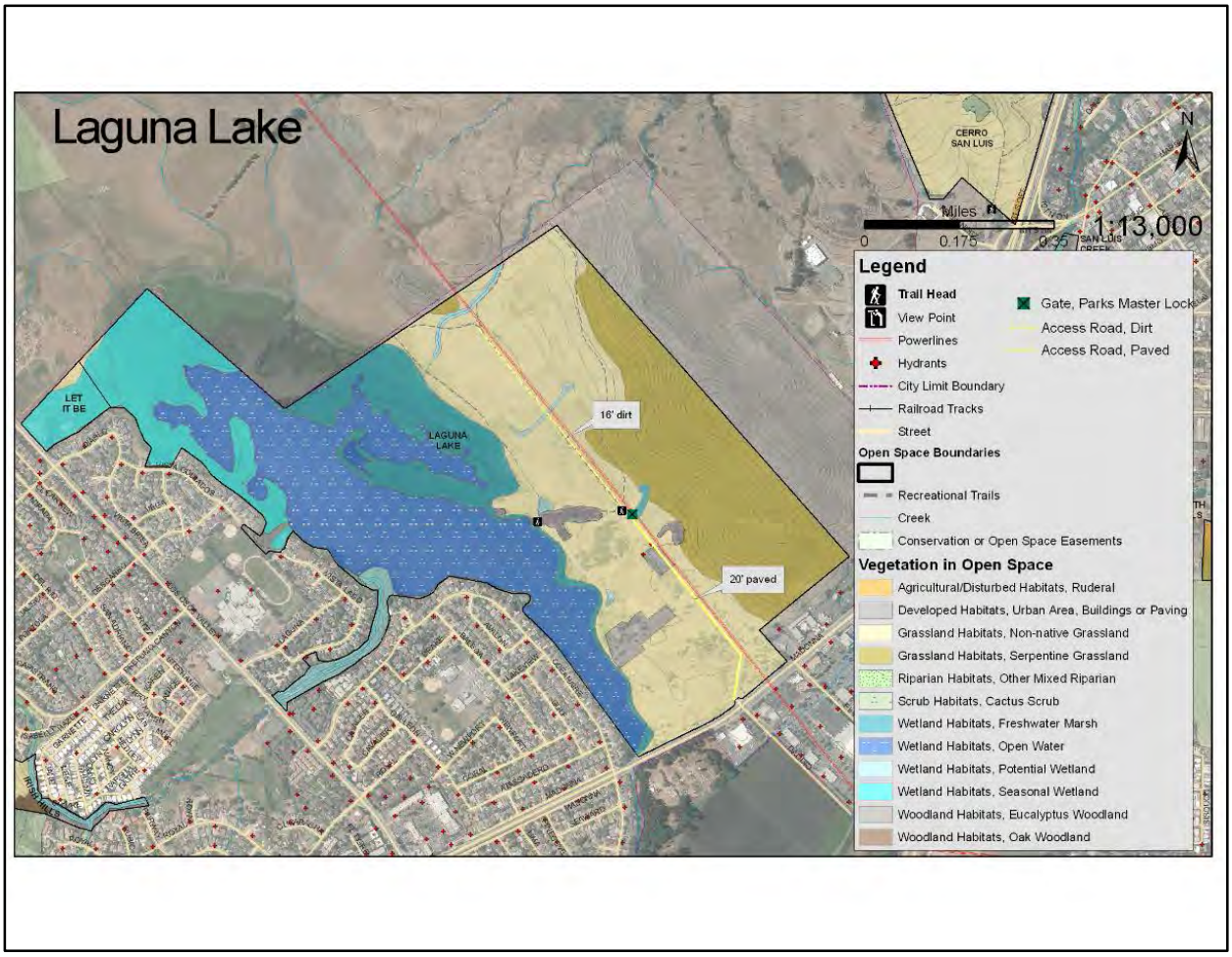


Figure 17. Laguna Lake Map.

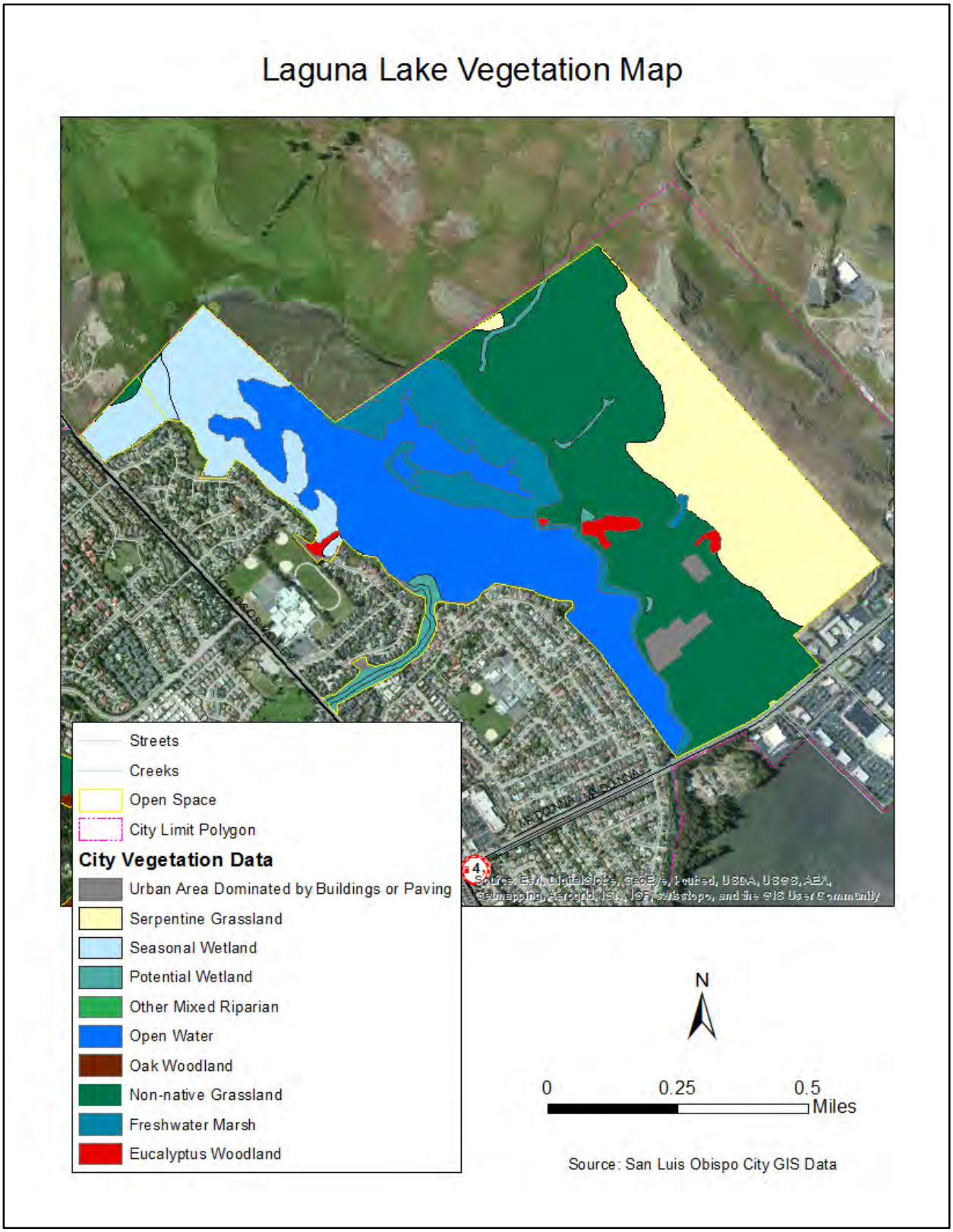


Figure 18. Laguna Lake Vegetation Map.

Fuel/Vegetation
The western half of Laguna Lake open space is about 100 acres of open water, 35 acres of freshwater marsh, and 7 acres of potential wetland and about 42 acres of seasonal wetland.

The other half of Laguna Lake is about 203 acres of Non-native Grassland and 77 acres of Serpentine Grassland, with a few patches of Eucalyptus Woodland, totaling about 4 acres.

Topography
Elevation changes from 120-200 feet, with the hilly area on the eastern portion of the property.

Assets at Risk/Structures
- Some endangered plants are found in the open space
- Nearby residential properties, separated from the vegetation by a lake
- Hotels on the south side of the open space along Madonna Road

Access
Heading west on Madonna Road, turn right on Dalidio Drive into Laguna Lake Park.

There is an access road from Dalidio that is 20' wide and paved, which leads to a locked gate and connects to a 16' wide dirt road. There is also access along the lake on the east side, connecting from Dalidio Drive.

Water Supply
There are two hydrants located at the end of Dalidio before the gate access to the dirt road. Additionally, the lake could be used for helicopter access to water if necessary.

There are also hydrants located along the roads adjacent to Laguna Lake on the western side.

Lastly, there are hydrants located along Madonna Road behind the hotels adjacent to the southeastern boundary.

Evacuation Routes
Evacuation would take place from the main driveway out of Dalidio to Madonna Road.

Historical Data
There is no history of major fires at this open space.

Predominant Risk Exposure
There is a high risk of human caused ignition on this property. There is also potential for ignition from the power lines that cross the open space.

Wildfire Preparedness Plan

Fire Hazard Severity Zone

There is a Moderate Fire Hazard Severity Zone nearby, however, there is no overlap.

Current Pre-Fire Plan

There is no prescription for Laguna Lake Open Space, as it isn't an immediate threat or a high priority. The Parks and Recreation Department is responsible for mowing, and there is weed whacking which takes place behind the hotels. There is also a limited grazing regime to reduce the heights of the grasses in the meadow.

Future Considerations

The areas with larger trees in the riparian areas as well as the eucalyptus trees near the peninsula should be monitored and managed to reduce fuel hazards. Lastly, the area adjacent to the boat launch should be mowed in the spring and early summer as well as any dead or downed trees should be removed.

Priority Ranking: Low

The grassland vegetation which is a majority on this property does not pose a high risk, so long as there is continued monitoring and managing of the larger trees and eucalyptus, as well as continuous annual mowing and weed whacking to the meadow and the power lines are maintained properly.

SOUTH HILLS

Figure 19. South Hills Aerial Map.

Description

Location

South Hills Natural Reserve is approximately 131 acres bordered by the Woodbridge and Stoneridge developments to the north and the new Margarita Area Development will boarder along the south.

Closest Fire Station: Fire Station 1

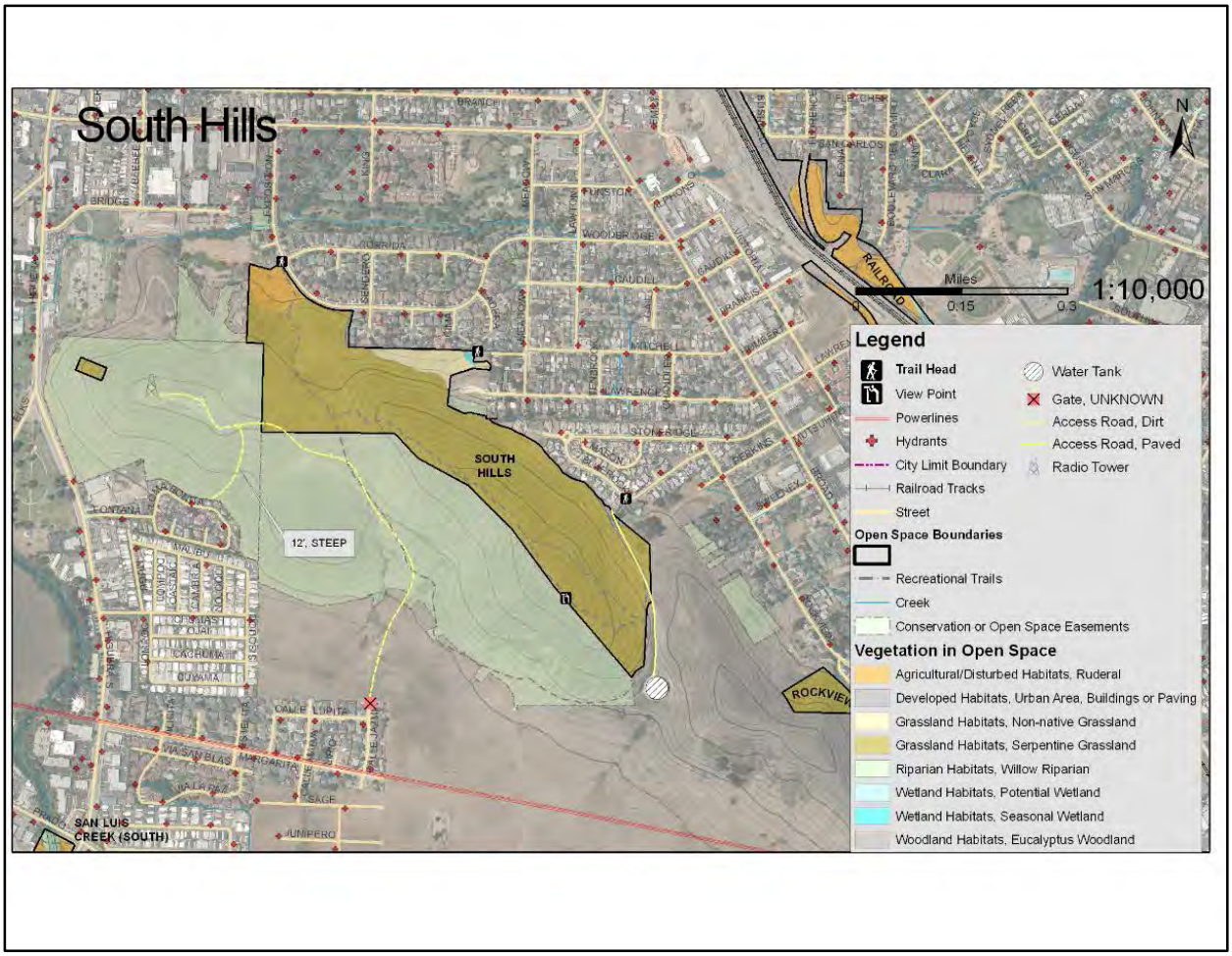


Figure 20. South Hills Map.
***Note: "UNKNOWN" gate is a Parks Master Lock**

Figure 21. South Hills Vegetation Map.

Fuel/Vegetation

South Hills is mostly serpentine grassland and annual grasslands.

Serpentine Grassland covers about 58 acres. Non-native Grassland is about 3 acres. The northernmost section of property of 3 acres is Agricultural/Disturbed habitats. There is also a small seasonal wetland on the eastern edge adjacent to the non-native grassland. There are a few small patches of Eucalyptus woodland on the eastern edge and southeast edge of the property.

Topography

Elevation ranges between 200 and 575 feet. It's a series of short ridges of serpentine running in a northwest-southeast direction with a saddle area in between the two ridges.

Assets at Risk/Structures

- Surrounding neighborhoods adjacent to the property
- Communication towers on the western summit
- Water tank southeast of the property

Access

Woodbridge Trailhead: Take South Street east and turn right onto Exposition Drive. Go straight and the road turns into Woodbridge Street. The trailhead is on the right.

Bluerock Trailhead: Taking Broad Street south, turn right onto Stoneridge Road. Go through a round-about and turn left onto Bluerock Drive. Trailhead is located just behind the Stoneridge Park on the right. This serves as a maintenance road for the City's water tank and for emergency vehicle access. There is an unpaved fire road that breaks off the paved road to the water tank and bisects the property to serve as an access road to the communication site located on the ridge above the "saddle" area on private property (Havlik & Otte, 2007).

There is also 4wd access on Calle Yasmine to the South.

There are two more access points proposed with the approved development.

There is access at Fontana to the south, leading to the radio and cell towers.

Water Supply

Hydrants are located at Calle Jazmin at Calle Lupita at the south access, Across from Stoneridge Park on Bluerock at the east access, along Woodbridge on the north, and along South Higuera and Loma Bonita on the west access.

Evacuation Routes
Margarita west to South Higuera; Woodbridge east to Meadow to South Street; Woodbridge west to Exposition to South Street; Bluerock and Stoneridge to Broad Street; Bridge (not accessible for Engine, only auto) to west to Higuera.

Historical Data
There is no history of major fires at this open space.

Predominant Risk Exposure
Major risks of ignition to this property would be from adjacent residential property, human causes, or from power lines which are south and run parallel to the Open Space.

Wildfire Preparedness Plan

Fire Hazard Severity Zone
Not located in a Fire Hazard Severity Zone

Current Pre-Fire Plan
As stated in the "South Hills Natural Reserve Conservation Plan:"

> Since there is basically no brush to be controlled or modified for fire protection purposes at SHNR, wildfire preparedness will concentrate on ensuring that emergency access designated in the Conservation Plan will be able to serve those needs, and that a minimum 20 foot mowed buffer will be maintained on the perimeter of the Reserve where it is adjacent to developed property. Some adjacent developments are already required to do such work, but in some places this requirement is not in effect, and City staff will ensure that this program is carried out in those areas. (Havlik & Otte, 2007, p. 18).

There is currently weed whacking the northern border. Additionally, cell phone towers on private property through a conservation easement.

Future Considerations
Margarita Specific Plan is on the southern boarder; once this comes in there should be a fence constructed. There is currently livestock permitted since the Open Space is not fenced off from the private property on the south. Eventually, livestock grazing will no longer be permitted.

Priority Ranking: Low
South Hills Natural Reserve is comprised of mostly flashy fuels without an imminent fire threat and can be maintained. Management, such as maintaining emergency access roads and a buffer, should be continued.

BISHOP PEAK

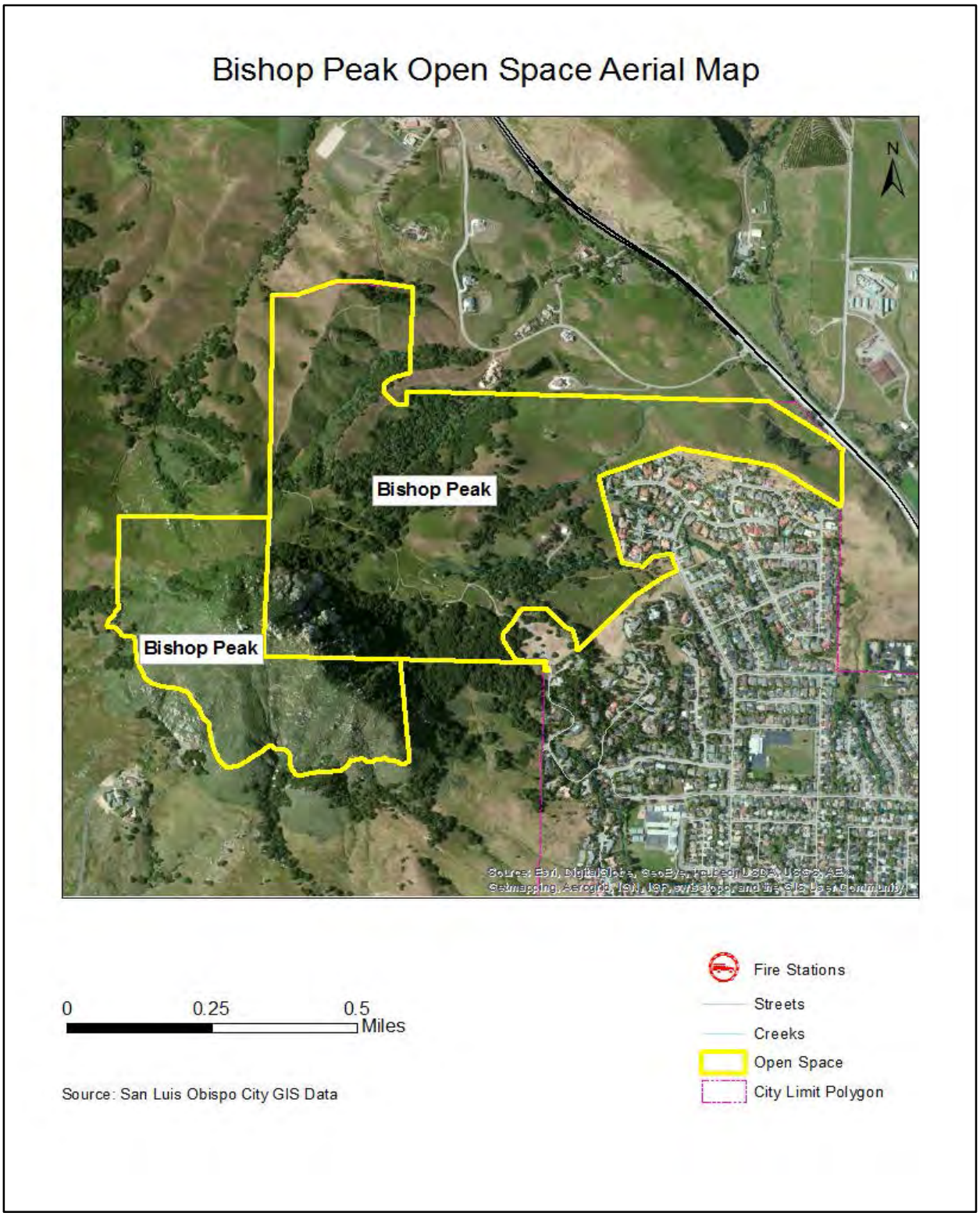


Figure 22. Bishop Peak Aerial Map.

Description

Location

Bishop Peak Natural Reserve is 352 acres. It is in both the City and County Limits in the northwest portion of San Luis Obispo. It is south of Highway 1 and north of Foothill Boulevard, with Patricia Drive on the east side.

Closest Fire Station: Fire Station 2

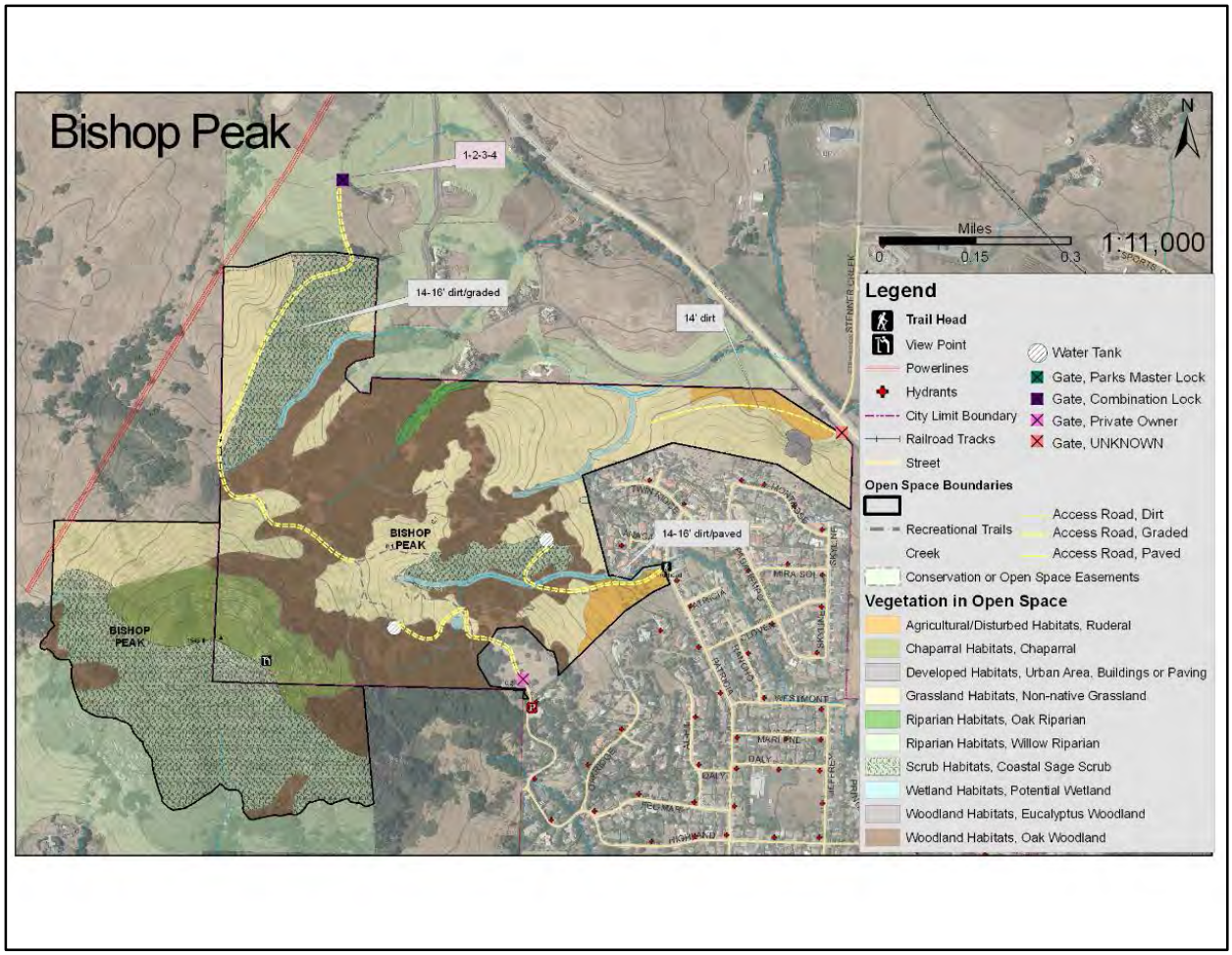


Figure 23. Bishop Peak Map.
***Note: "Unknown Gate" is a Parks Master Lock**

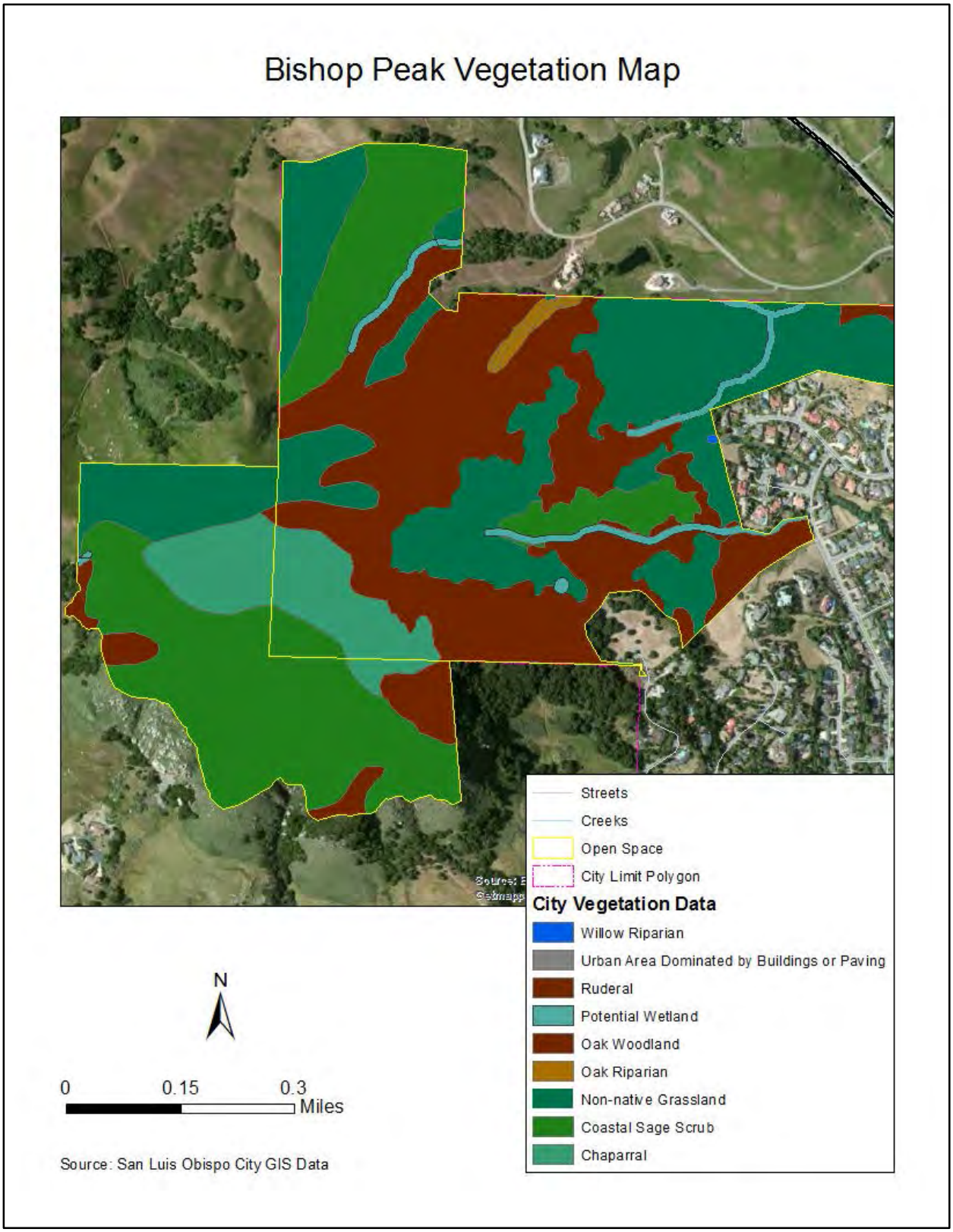


Figure 24. Bishop Peak Vegetation Map.

Fuel/Vegetation

Oak Woodlands cover about 100 acres in the center of the property, on the north and east facing hillsides and swales.

There are about 101 acres of Non-native Grasslands.

Coastal Sage Scrub is found in the northern, southern, and western areas, totaling about 83 acres.

Chaparral covers 25 acres.

Potential Wetlands run on the eastern portions of the property along creeks, totaling about 6 acres.

Topography

Elevation from about 550 ft. to 1559 ft. at the peak

Assets at Risk/Structures

- Neighborhoods north and east of the Open Space
- Two water tanks located on the property

Access

Patricia Avenue: Heading west on Foothill Boulevard, turn right onto Patricia Drive. Follow Patricia Drive and just after Patricia Court is the trailhead on the left. 14-16' dirt and paved road leading up to a water tank. Used for maintenance or emergency services.

Highland Drive: Heading west on Highland Drive up to Brittany Circle leads to an as an access road which leads up to a water tank.

Highway 1 gate: Emergency services access and cattle access only. Private Owner Gate to a 14' wide dirt road.

Bishop Peak Ranch Northern Gate: Not open to the public. Emergency and maintenance. 14-16' dirt/graded road.

Bishop Peak Ranch Southern Gate: Not open to the public. Movement of cattle, pedestrian emergency services and maintenance.

Bishop Peak Ranch Middle Gate: Not open to public. Movement for cattle, pedestrian emergency services and maintenance.

Water Supply

There are hydrants located on Brittany Circle off of Highland Drive as well as along Patricia, including near the trailhead south of Anacapa Circle.

There is a hydrant at the end of Anacapa Circle, and at the corner of Twin Ridge Drive and Twin Ridge Court to the north. There are also hydrants located along Montrose Drive.

Another hydrant is located at the end of Clover Drive off of Patricia Drive.

Evacuation Routes

From the north, take Patricia Drive South, then east on Highland Drive.

From the south, take Brittany Circle south, then east on Highland Drive.

Take Oakridge Drive south to Highland Drive east.

Historical Data

Colony Fire, 2003
Bishop Peak Fire, July 16, 2013

Predominant Risk Exposure

Bishop peak is a highly active recreation site, with high risk of human cased ignition. It also has power lines that run along the western portion of the property. Lastly, it is adjacent to numerous residential properties to the east and north.

Wildfire Preparedness Plan

Fire Hazard Severity Zone

High Fire Hazard Severity Zone
Moderate Fire Hazard Severity Zone on the boarder of the property

Current Pre-Fire Plan

As per the "Bishop Peak Natural Reserve Conservation Plan," five areas have been identified for vegetation management procedures:

> Potential Prescribed Burning Area – areas identified as supporting a high load of vegetative fuel that could be safely reduced by burning under prescribed weather and wind conditions.
>
> Fuel Management Area – areas adjacent to the urban/wildland interface that could not be safely burned in a controlled manner. These areas will require active pruning,

mowing, and/or other active management of the vegetation (including livestock grazing) to reduce fuel loads adjacent to developed properties

Active Firefighting Area – areas acting as a buffer between the surrounding urban developments and the pristine habitat lying to the west but still within the BPNR. Active firefighting techniques such as the use of heavy machinery and cutting of fuel breaks can be used to isolate property from an advancing wildfire. These areas have also been identified because the physical resources and topography are conducive to successful restoration efforts following a wildfire.

Passive (habitat sensitive) firefighting area – areas of important wildlife habitat, mostly on steep hillsides. These areas are also somewhat removed from urban development. They are particularly sensitive to aggressive firefighting techniques such as the use of heavy machinery. Therefore, wherever practicable, firefighting strategies in these areas should be limited to low impact, habitat friendly methods.

Construction of continuous emergency maintenance road – at the present time, vehicular access to portions of BPNR which experience high maintenance and occasional emergency access is poor. This is particularly problematic in the area of the pond. A ¼ mile of new jeep road connecting to the upper Bunnel Road to the road from Brittany Court (Highland Drive), which reaches Highway 1, will be constructed. This will create a continuous emergency/maintenance road access across the property. Due to two recent fires on the open space and the level of heavy use the area receives, City staff believe that construction of this portion of the access road is essential ensure the continued safety of people using the reserve (Havlik & Clarke, 2004, pp. 35-36).

This has been constructed for the most part, but the entire alignment has not been made.

Additionally, there is annual mowing treatment, and areas adjacent to residential properties require active mowing, thinning, and reduction of fuel loads.

There is a fire break that needs to be maintained on the Felsman Loop back bridge.

Future Considerations

The continuous emergency management road should be completed in the future.

The fire break on the Felsman Loop back bridge also needs to be maintained in the future.

Livestock grazing could also be utilized, as per the Conservation Guidelines for Bishop Peak Natural Reserve (BPNR). This would be permitted on the Ferrini Open Space portion and will be divided by fencing into upper and lower pastures. The upper pasture will allow livestock grazing during the growing season from March 15 to around June 15. The lower pasture will allow

livestock grazing from approximately March 15 to November 1. Therefore, there will be no livestock grazing from approximately November 1 to March 15. (Havlik & Clarke, 2004).

Priority Ranking: High

Due to Fire History, assets at risk, vegetation on the property such as chaparral, steep slopes, and minimal escape routes from the property, Bishop Peak is a High priority ranking.

RESERVOIR CANYON NATURAL RESERVE

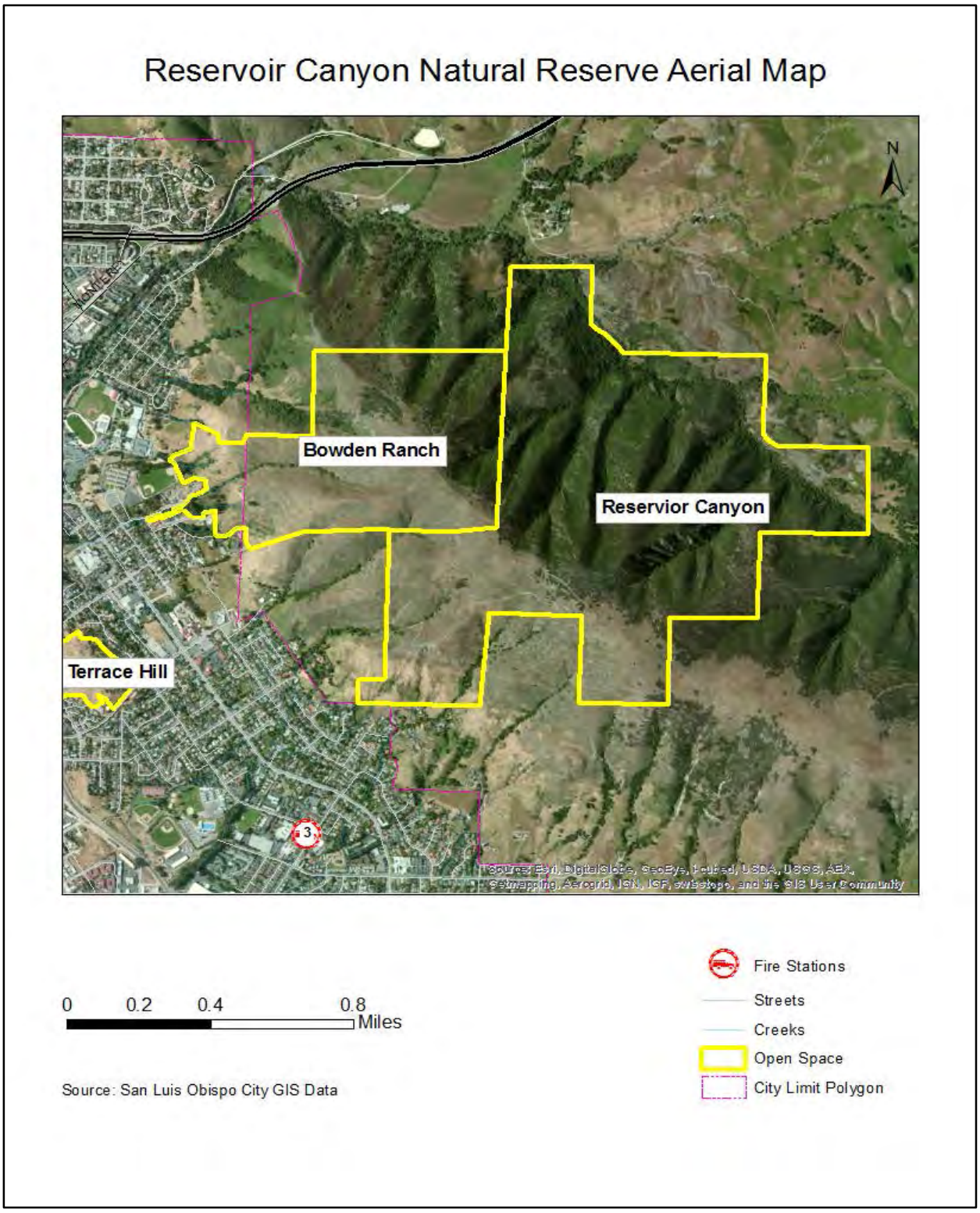


Figure 25. Reservoir Canyon Natural Reserve Aerial Map.

Description

Location

Reservoir Canyon Natural Reserve is about 800 acres, located off Highway 101 northeast of the city. It contains Reservoir Canyon Open Space on the east and Bowden Ranch Open Space on the West. It is owned by the city, yet located in the County's jurisdiction.

Closest Fire Station: Fire Station 3

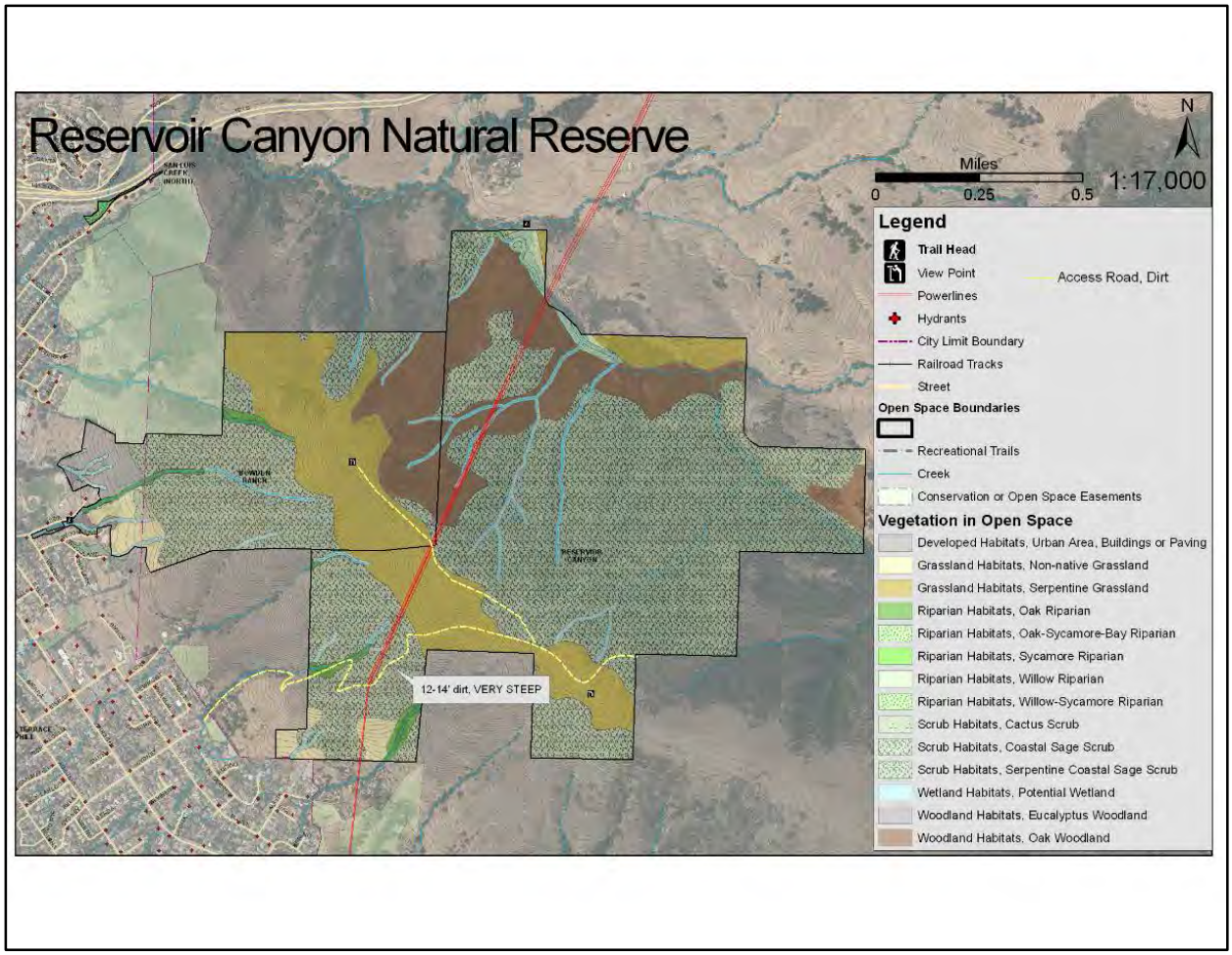


Figure 26. Reservoir Canyon Natural Reserve Map.

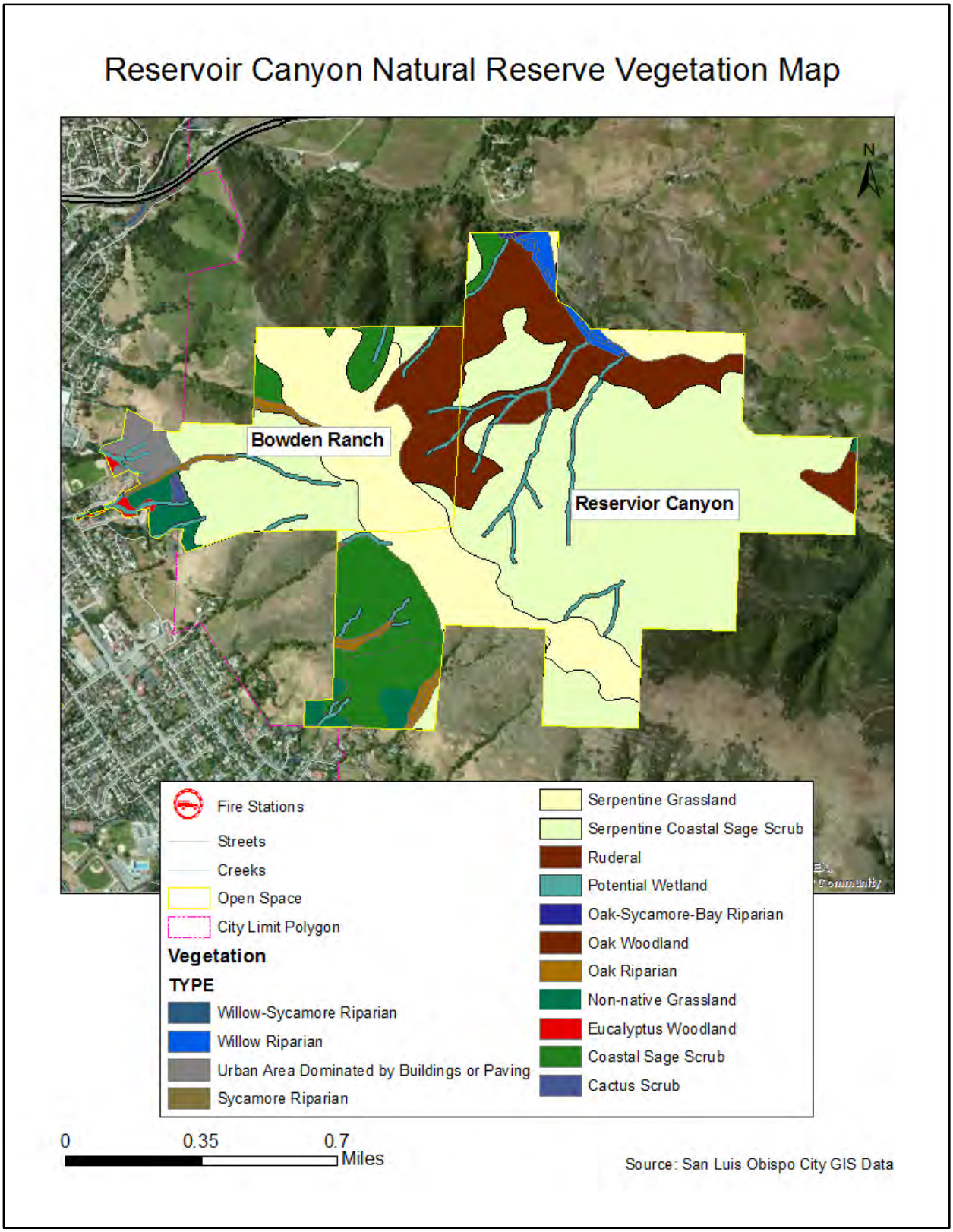


Figure 27. Reservoir Canyon Natural Reserve Vegetation Map.

Fuel/Vegetation

There are a few habitats found in the Reservoir Canyon Natural Reserve, including Serpentine Coastal Sage Scrub, Oak Woodland, Serpentine Grassland, and Coastal Sage Scrub.

A majority of both properties is Serpentine Coastal Sage Scrub, covering about 400 acres.

There is also about 75 acres of Coastal Sage Scrub, found at the northern portion of both Open Spaces, as well as the southwestern portion of Reservoir Canyon Open Space.

About 110 acres of Oak Woodland is found in the northern part of the canyon, with Willow Riparian and other potential wetland habitat following the creeks.

There are two perennial creeks which are fed by springs and seeps along the ridge, which leads to riparian habitats at the bottom of the canyon (Havlik, Hill, Otte, & Provenzale, 2013). These Riparian habitats and Potential Wetlands lead to about 2 acres of Eucalyptus Woodlands.

There are about 140 acres total of Serpentine Grassland, which runs along the northern portion of Bowden Ranch and down through to the southeastern portion of Reservoir Canyon, as well as the northern portion of Reservoir Canyon above the Oak Woodlands.

Coastal Sage Scrub takes up approximately 75 acres in the southwestern part of Reservoir Canyon as well as a few patches in the northern portions of Bowden Ranch and Reservoir Canyon.

In the western portion of Bowden Ranch, there are almost 10 acres of Non-Native Grassland Habitat and about 8 acres of Oak Riparian Habitat and Potential Wetlands. Lastly, there is about an acre of Cactus Scrub habitat.

Topography

Ranges from 400 feet to 1,715 feet of mostly steep terrain.

Assets at Risk/Structures

- Lizzie St. Neighborhood
- Surrounding neighborhoods to the west and south of the Open Space
- La Loma Adobe has historical significance and is proposed to be included in the Reservoir Canyon Natural Reserve

Access

Access at the north entrance is from Reservoir Canyon Road, one mile north of the City of San Luis Obispo limits, east off of Highway 101.

There is another access point off of the top of Lizzie Street through the Bowden Ranch Open Space entrance.

There is a 12-14' very steep dirt access road from the end of Sydney Street.

Water Supply

There are hydrants located on Lizzie Court, Woodland Court, and Woodland Drive. There are also hydrants located along Flora Street, Sunset Drive, and at the end of Sydney Street.

Evacuation Routes

Lizzie Court west and then north on Johnson Avenue, Woodland Court to north on Wilding Lane and west on Lizzie Street.

Head southwest on Sydney Street and north on Johnson Avenue.

Historical Data

Las Pilitas Fire in July of 1985, burned a total of 75,000 acres in the county
Highway 41 in 1994
Highway 58 in 1996
Johnson Fire, 2007 (Bowden Ranch)
Bowden Ranch Fire, August 27, 2013 (Bowden Ranch)

Predominant Risk Exposure

There are power lines which traverse through the Natural Reserve, which is a risk for potential ignition. Additionally, Highway 101 is located northwest of the property, with risk for ignition from motor vehicles. Lastly, there are residential properties against the property as well as the risk from humans.

Wildfire Preparedness Plan

Fire Hazard Severity Zone

Very High Fire Hazard Severity Zone
High Fire Hazard Severity Zone
Moderate Fire Hazard Severity Zone

Current Pre-Fire Plan

As stated in the Reservoir Canyon Natural Reserve Conservation Plan, the Natural Reserve is owned by the city, yet mostly in County Jurisdiction. Additionally, most of the land is in the State Responsibility Area. The City's primary responsibility area is the portion of the boundary which contains Eucalyptus groves near the Bowden Ranch entrance to the property. The Conservation Plan also states that "these groves will continue to be managed with safety pruning and selection removal over time in order to allow younger oak trees light and space to grow, while maintaining the tree canopy of the larger eucalyptus trees that provide the character and backdrop to the neighborhood. These activities will be undertaken outside of

nesting bird season and with notice to neighbors unless an imminent safety hazard is determined" (Havlik, Hill, Otte, Provenzal, 2013, p. 23)

There should be continuous thinning behind homes as needed, especially in the Eucalyptus grove behind Taylor Field with access through school district property.

Access is limited to some of the property; therefore more fire suppression would potentially be from the air.

Future Considerations

There is a shaded fuel break at Bowden Creek which gets maintained every three years and is going to be continued in the winter of 2014-2015.

Continued thinning behind homes, especially in the Eucalyptus grove behind Taylor Field.

There should also be a focused outreach with the Lizzie Street neighborhood to address concerns with vegetation management and educate the community on ways to manage risks and steps that the City is taking to ensure public safety and natural resources protection.

Priority Ranking: High

Due to the fire hazard, fire history, assets at risk, and steep topography of the area, Reservoir Canyon Natural Reserve is a High priority for the City to manage.

STENNER SPRINGS

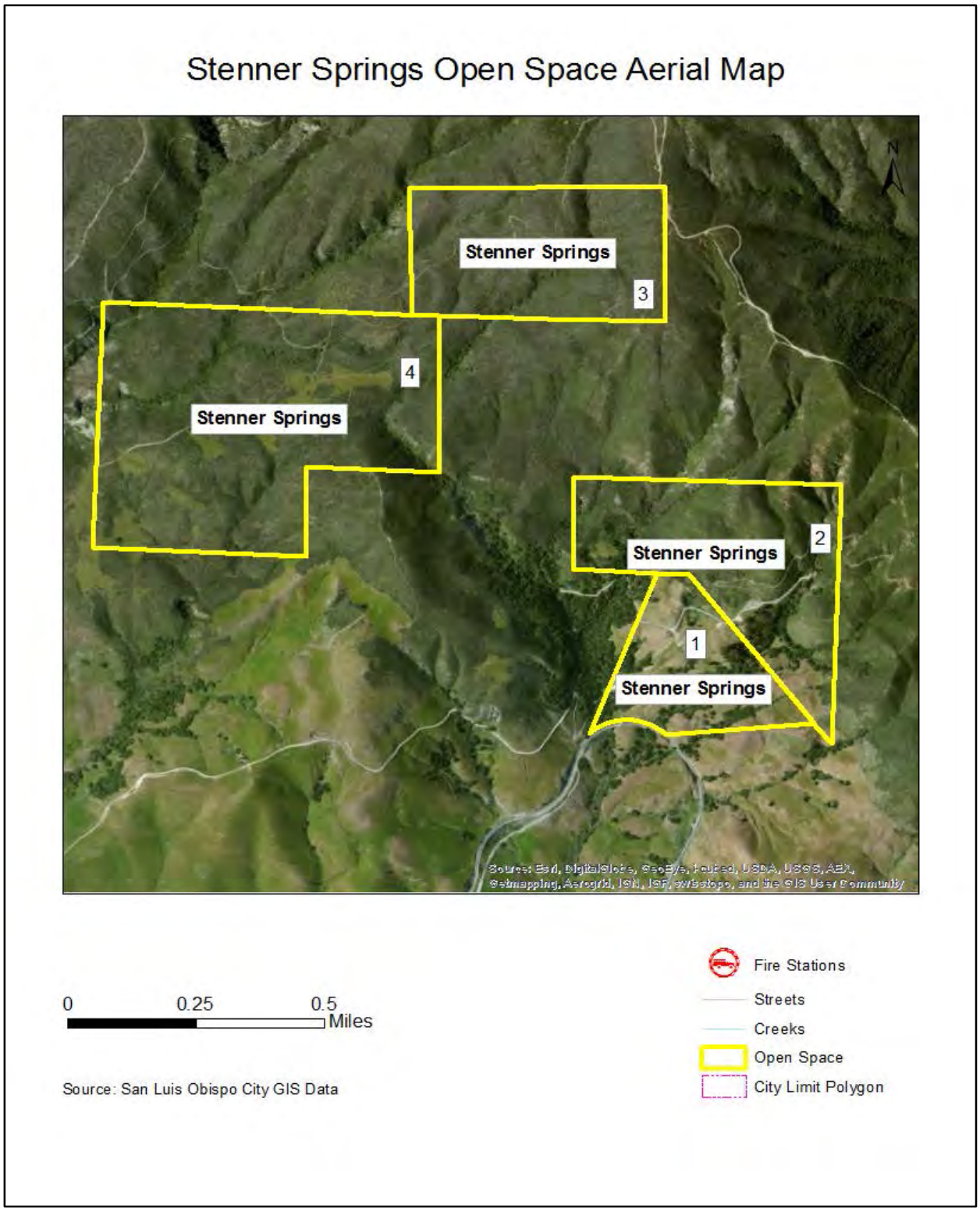


Figure 28. Stenner Springs Aerial Map.

Description

Location

Stenner Springs is about 365 acres divided into four parcels, located partially within and partially adjacent to Los Padres National Forest in Stenner Creek Canyon, about four miles north of the City of San Luis Obispo. It's bordered by the US Forest Service, Cal Poly, Camp San Luis Obispo, and a private property known as Stenner Ranch. The property is about four miles north of the City of San Luis Obispo.

Closest Fire Station: Fire Station 2

Ownership: two sections are Conservation Easements held by the Land Conservancy; one parcel is 50% ownership with the state of California

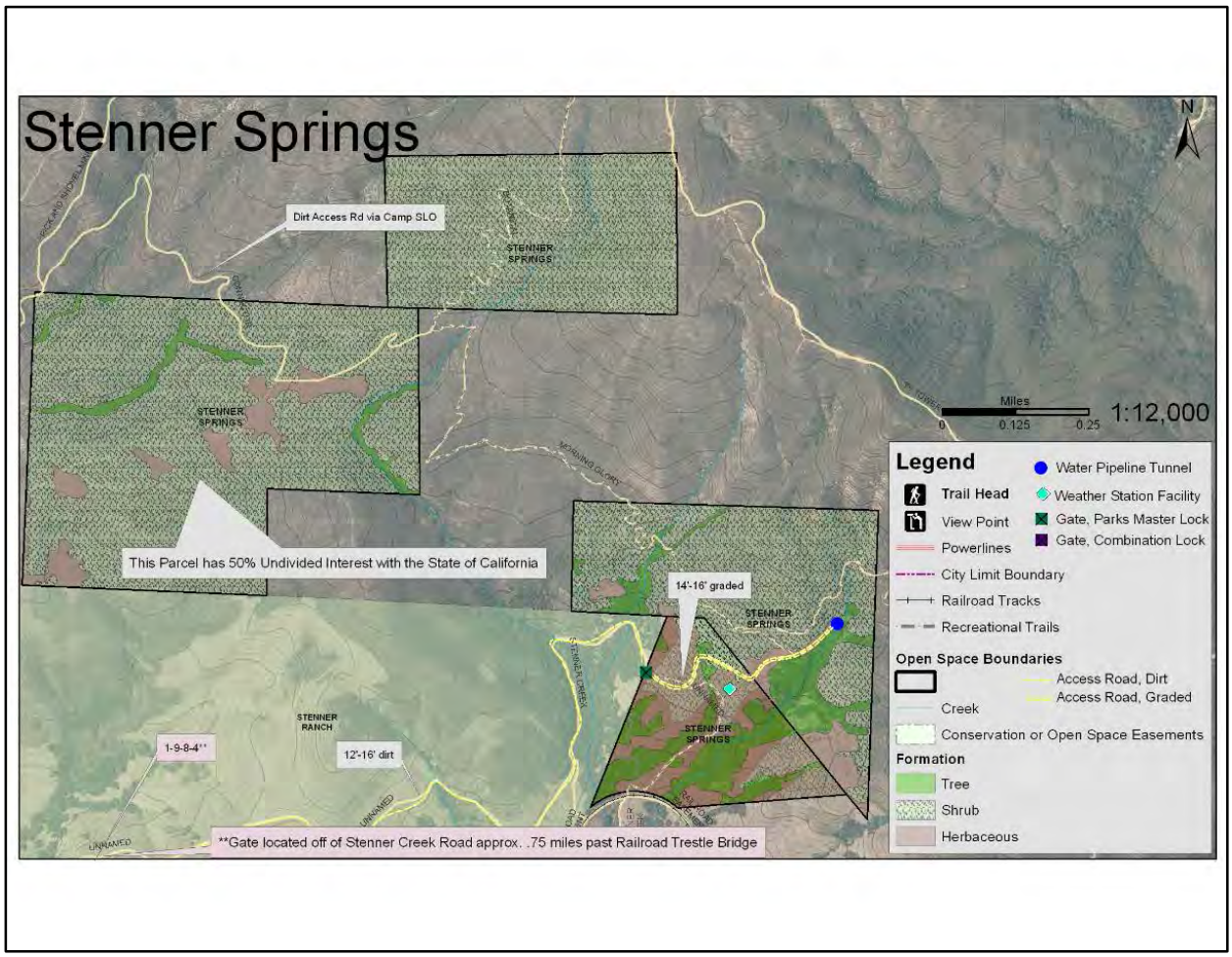


Figure 29. Stenner Springs Map.

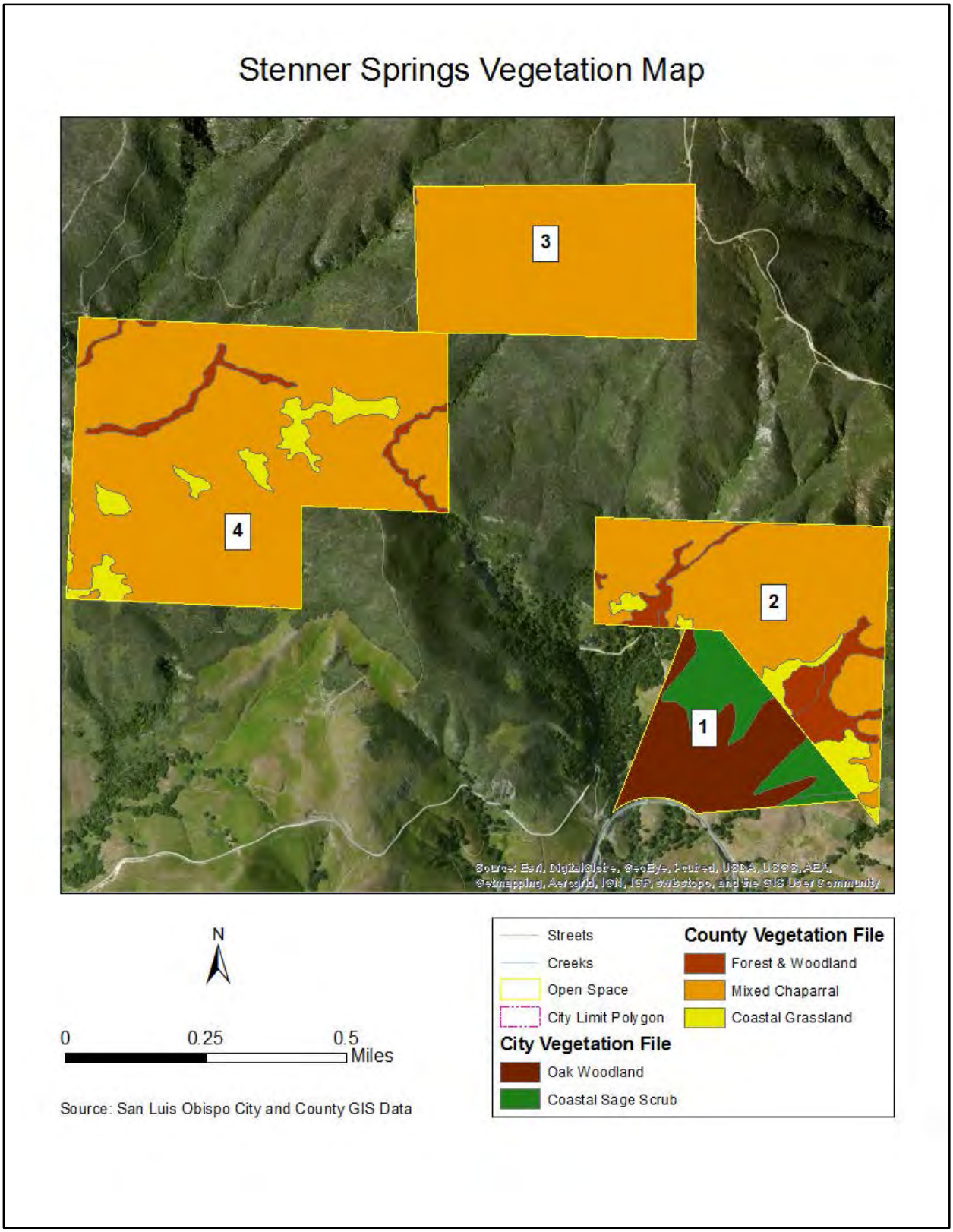


Figure 30. Stenner Springs Vegetation Map.

Fuel/Vegetation

The City GIS Data was not available for the entire section of Stenner Springs, therefore the County GIS Vegetation Data and information from the Stenner Springs Conservation Plan was used for analysis.

A majority of the properties are shrubland and grassland, which is specified in the Conservation Plan as chaparral and coastal scrub.

There are also some patches of coastal grassland, or serpentine bunchgrass found on parcels 2 and 4.

There are also oak woodlands occurring along waters and in lower elevations of the parcels.

There are two planted eucalyptus groves which cover about four acres, and that have a dense understory.

Wetlands of springs and waterways with Sargent Cypress are found on parcels 3 and 4. A much larger strand of Sargent Cypress is on the National Forests Land directly north of parcel 3.

Topography

Elevations range from 900 to 2200 feet above sea level

Assets at Risk/Structures

- Multiple sensitive and rare plant and animal species, such as the endangered California Red-legged frogs
- City and state water and a water pipeline tunnel
- Weather station facility
- Fire Communication

Access

Eastern access: take US Highway 101 north from San Luis Obispo to the top of Cuesta Grade. Head west on TV Tower Road about one mile to mountain bike train “Shooters” and 2.5 miles to hiking trails “Morning Glory” and “Botanical.”

Southern access: head west out of San Luis Obispo on Highway 1 towards Morro Bay, slightly less than a mile outside of town turn right onto Stenner Creek Road. Follow Stenner Creek Road for about 2.5 miles to the end. There is a gate located off of Stenner Creek Road approximately 0.75 miles past Railroad Thistle Bridge, which leads to a 12-16’ dirt access road up to Stenner Springs Property in the southern parcel. There is another Gate and a 14-16’ graded access road which leads to the Water Pipeline Tunnel.

Vehicular access for maintenance purposes is available through Camp San Luis Obispo on a dirt access road from the west.

Water Supply
There are no fire hydrants located in close proximity to Stenner Springs.

Evacuation Routes
TV Tower Road east to US Highway 101 north or south.

Stenner Creek Road south to Highway 1.

Historical Data
Unnamed fire in 1939.
HWY 41 Fire was a major fire in 1994, but the health of the vegetation is considered very good and almost in full recovery.

Predominant Risk Exposure
Major risks to this area are from recreational users, railroad tracks, and power lines.

Wildfire Preparedness Plan

Fire Hazard Severity Zone
Very High Fire Hazard Severity Zone
Moderate Fire Hazard Severity Zone

Current Pre-Fire Plan
Livestock grazing is currently permitted from the adjacent Cal Poly lands to the south.

As noted in the Wildfire Preparedness Plan section of the Stenner Springs Conservation Plan, this property "is located in such a remote location without an immediate wildland urban interface, therefore management is deferred to the county and a specific Wildfire Preparedness Plan isn't necessary. However, access for fire and safety vehicles should be maintained" (Havlik, Otte, & Lloyd, 2007, p. 24).

Future Considerations
Interagency coordination is necessary for this property, especially considering its proximity to other agency's responsibility areas.

Priority Ranking: Medium
Stenner Springs has chaparral, oak woodland, and eucalyptus groves, which are hazardous, as well as risk from nearby vehicular traffic, recreational users, and risk from the railroad and power lines. Stenner Springs is a high priority when taking into account critical infrastructure and fire hazards. There is significant potential for loss of property. However, from a Wildland Urban Interface perspective, this area is not a high priority due to its separation from urban

areas. Additionally, this Stenner Springs is found in a State Responsibility Area, and CAL FIRE can use fees for fuel breaks in this area, and projects should be collaborated on with City staff. Therefore, Stenner Springs is considered a High Priority to manage, but the management should be done through interagency coordination and the City should initiate interagency projects.

IMPLEMENTATION PLAN

Priority Raking of Open Spaces

The City should address Open Spaces that are seen as a High Priority first, and determine the best management plans, utilizing a master timeline of projects for each Open Space. It would be ideal to create a timeline of projects that should take place and potential costs far in advance of fire season. It would also be beneficial to be prepared for potential setbacks such as waiting for obtainment of grant resources or environmental considerations such as nesting season.

Open Spaces with a High Priority Ranking:

- Johnson Ranch
- Cerro San Luis
- Irish Hills
- Bishop Peak
- Reservoir Canyon

Open Spaces with a Medium Priority Ranking:

- Stenner Springs

Open Spaces with a Low Priority Ranking:

- Terrace Hill
- Laguna Lake
- South Hills

Community Outreach Suggestions

All of the wildfire preparedness plans that are ongoing and that have been proposed through Open Space Conservation Plans have gone through considerable community outreach and received public input. However, it is still important to communicate with local residents, especially those who use the areas for recreation and those who live adjacent to the property. When projects such as trimming or removal of trees or chemical management are utilized, it is necessary to inform and educate local residents on the necessity of the project and precautions that have been taken to ensure that both the public and natural resources are protected. Some suggested methods of outreach could be informational brochures provided for residents at their homes, holding informational meetings, or having an active website that addresses vegetation management projects that are occurring in their neighborhood.

Fiscal Statement

There are costs associated with each project for the vegetation management. Natural Resources Program has funds in its operating budget. Ranger Services also has funds available in its operating budget. Parks and Maintenance (Public works) has some funds in its budget. City Fire Department has money in fire budget, as well as FireSafe Council grants, and as well as Mutual Aid Resources though CAL Fire.

CONCLUSIONS

The City Fire Department can effectively manage the risk of wildland fires in the City Open Space Property through pre-fire planning and vegetation management, therefore reducing the risk of loss of life, property, and resources from wildland fires. There are necessary precautions that should be taken into account such as nesting season and sensitive biological species, and projects should be done in collaboration with the City of San Luis Obispo Natural Resources Department.

The next step would be to secure funding for projects and develop a master timeline of projects which includes every open space, based upon this management plan. It is important to simultaneously be communicating with and informing local residents on large-scale projects.

The City should update this Plan as necessary, and reflect and evaluate effectiveness of the vegetation management projects that are implemented, subsequently revising procedures as best seen fit.

APPENDIX A

References

Blonski, K., Miller, C., & Rice, C. L. (2010). *Managing fire in the wildland interface*. Point Arena, California: Solano Press Books.

CAL FIRE. (2013). [Map of fire history in San Luis Obispo County May 28, 2014]. *Fire History Data from San Luis Obispo County GIS Data.* Retrieved from Shape File: CF_FIRE_HISTORY.

California Department of Forestry and Fire Protection (2000, April). *Property Inspection Guide.* Retrieved from CAL FIRE: http://cdfdata.fire.ca.gov/pub/fireplan/fpupload/fppguidepdf38.pdf

City of San Luis Obispo. (2014). *San Luis Obispo Municipal Code.* Code Publishing, Inc. San Luis Obispo, CA. Retrieved from http://www.codepublishing.com/ca/sanluisobispo/

City of San Luis Obispo. (2014). *City of San Luis Obispo draft local hazard mitigation plan*. Retrieved from website: http://slocity.org/cityclerk/agendas/2014/020414/ph4localhazardmitigationplan.pdf

City of San Luis Obispo. (2010). *City of San Luis Obispo Zoning Regulations.* City of San Luis Obispo Community Development Department. Retrieved from http://www.slocity.org/communitydevelopment/download/Zoning%20Code%202010-Complete%20Document.pdf

County of San Luis Obispo. (2008). [Map of vegetation for the County of San Luis Obispo]. *Vegetation Shape File from San Luis Obispo County GIS Data.* Retrieved from Shape File: PLN_VEG_SLOCO_2007

Havlik, N. & Clarke, M. (2005). *Cerro San Luis Natural Reserve Conservation Plan.* City of San Luis Obispo Natural Resources Protection Program. San Luis Obispo, CA.

Havlik, N., Hill, R.A., Otte, F., & Provenzale, B.. (2013). *Reservoir Canyon Natural Reserve Conservation Plan.* City of San Luis Obispo Natural Resources Protection Program. San Luis Obispo, CA.

Havlik, N., Otte, F., Riley B. (2011). *Irish Hills Natural Reserve Conservation Plan Draft 2011 Update.* City of San Luis Obispo Natural Resources Protection Program. San Luis Obispo, CA.

Havlik, N., Otte, F., Lloyd, J. (2007). *Stenner Springs Natural Reserve Draft Conservation Plan.* City of San Luis Obispo Natural Resources Protection Program. San Luis Obispo, CA.

Havlik, N. & Otte, F. (2008). *Conservation Plan for the Johnson Ranch Open Space.* City of San Luis Obispo Natural Resources Protection Plan. San Luis Obispo, CA.

Havlik, N. & Otte, F. (2007). *South Hills Natural Reserve Conservation Plan.* City of San Luis Obispo Natural Resources Protection Plan. San Luis Obispo, CA.

United States Department of Agriculture, Forest Service. (2002). *Vegetation management planning guide: Planning and implementation for developed sites in region 2*. Retrieved from website: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_038983.pdf

APPENDIX B

Discrepancies in Data

GIS Data for City Vegetation
The data has been clipped to the open space. When figuring out acreage of an area of vegetation that runs outside the open space boundaries, the amount of acres states the total of that section, not necessarily the section within the boundary of the open space. Therefore, there was a column added to the attribute table and the acres were recalculated based on the boundaries of the Open Spaces. However, it is important to note that these acres were sometimes off and exact estimates should be used with discretion.

Another inconsistency in the data was that some of the Conservation Plans explained the vegetation for certain Open Spaces based upon the County GIS Vegetation Data, which is not as accurate or specific as the City GIS Vegetation Data. In an effort to make the most accurate portrayal of the vegetation, the City GIS Vegetation Data was used wherever possible. The discrepancies and inconsistencies are as follows:

- Johnson Ranch Open Space Conservation Plan has Vegetation Communities based upon 2007 data from the County GIS shape file. For the purposes of this plan, the City GIS Vegetation shape file was used.
- Additionally, there were discrepancies in the amount of acres of vegetation in certain open spaces from GIS data and Conservation Plans information. For example, Irish Hills Natural Reserve Conservation Plan Update has different acres of the vegetation than found on the City GIS Data. The plan states that serpentine Chaparral covers most of the property, covering 832 acres, and the GIS data has 631 acres. The plan also states that Oak Woodland habitat covers approximately 166 acres, and GIS data said 234 acres. Lastly, Non-native Grassland covers approximately 74 acres based on the Conservation Plan, and the GIS Data stated it was about 96 acres. These inconsistencies could be a variation from the GIS data or from analysis from different years, as vegetation can change over time. There is also the possibility that one vegetation survey is more accurate than another.

It is recommended that the City maintain consistency in the future with analysis of vegetation and note where the information is being obtained.

Integrated Vegetation Management Plan

FOR

Open Space Lands

Of the City of San Luis Obispo

(San Luis Obispo, CA)

2015 - 2020

PREPARED BY Jonathan Hall, The Land Conservancy of San Luis Obispo County

(Note: This plan is a modification of a weed management plan template produced by The Nature Conservancy)

Table of Contents

1. INTRODUCTION

1.1 Description of the Site and Management Goals

The City of San Luis Obispo is surrounded by a network of Open Space Areas encompassing over 3,500 acres. San Luis Obispo (SLO) residents are justly proud of their rich and diverse environmental setting. Creeks, hills, morros, valleys and farmland create a striking landscape which is home to a wide variety of plants and animals. Over two hundred species of birds have been identified in the area and many amphibians, reptile and mammal species occur as well. The many creeks provide sheltered corridors that allow wildlife to move between habitats and open space areas while supporting populations of threatened southern steelhead trout and other native fishes.

In January 1994, the City Council adopted an updated Open Space Element to the General Plan for the City of San Luis Obispo. The Conservation and Open Space Element is a tool to protect and preserve these unique community resources. **Its overarching goal is to protect resources (such as air and water, wildlife habitat, scenic and agricultural lands, watershed and historic features) with a secondary goal of accommodating passive recreation where it will not harm the environment or interfere with agricultural operations.**

The current Open Space Areas owned in fee and managed by the City of San Luis Obispo are: Stenner Springs Natural Reserve, Bishop Peak Natural Reserve, Reservoir Canyon Natural Reserve, Cerro San Luis Natural Reserve, Laguna Lake Natural Reserve, Irish Hills Natural Reserve, Johnson Ranch Open Space, Filipponi Ecological Reserve, South Hills Natural Reserve, and the Terrace Hill Open Space (Map 1).

Each open space property is divided into land use designations that define how the property will be managed. This provides a practical means of achieving management objectives. The proposed land use designations are:

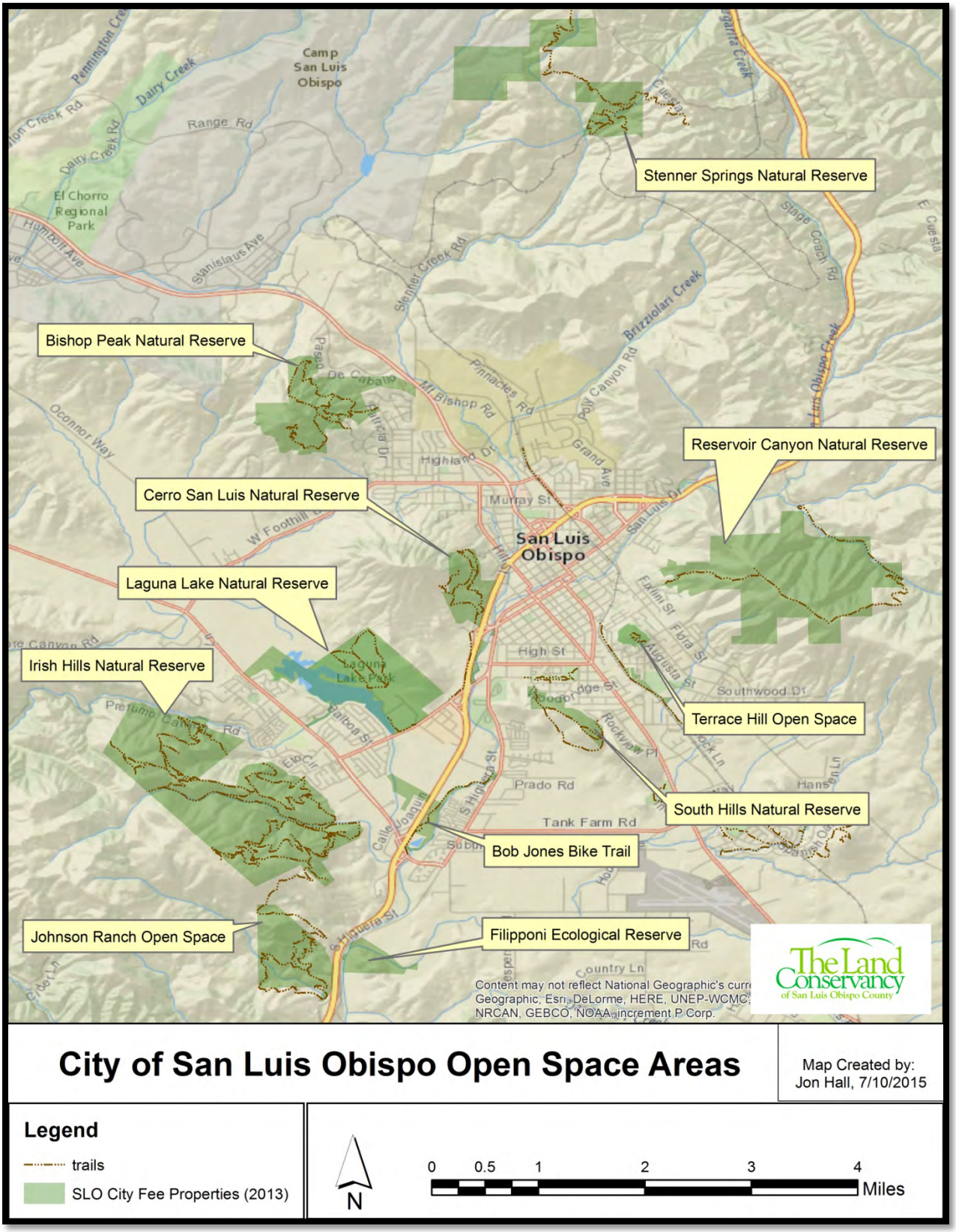
- *Habitat Area* – Land on which the primary objective will be to protect natural resources essential to the continued existence of native plants and resident and migratory wildlife.

- *Management Area/Trail Corridor* – Lands that have the potential to support low levels of recreational pressure or animal grazing; or those areas that may be impacted by adjacent land uses. Active management of land in these areas will be required to facilitate approved activities while protecting valuable natural resources.

- *Restoration Area* – Land on which restoration and enhancement of plant and animal habitats will be pursued in an effort to restore damaged or impacted natural resources.

- *Cultural/Historic Area* – Land managed to preserve and/or enhance cultural or historic resources on the site and provide for their interpretation. Restorative measures may be implemented if necessary.

- *Agricultural Area* – Land that will be managed for the production of row crops or forage (not including grazing lands) in a manner consistent with the protection and preservation of natural resources represented on the site.



Map 1. City of San Luis Obispo Open Space Areas.

1.2. How Non-Native Plants Interfere With Management Goals

The flora of the City of San Luis Obispo Open Space Areas includes over 190 non-native species, most of which were introduced and became established within the past 150 years. (For the purposes of this document, the term “non-native” is defined as a species that was introduced to California from elsewhere after the year 1542. In this document it is used synonymously with "alien", "exotic", “non-indigenous” and "introduced".) There is potential for many more exotic plant species to enter the City’s Open Space Areas in the future, and for present populations to increase in number, area covered and density.

A small percentage of non-native plant species become established, expand rapidly and have negative effects on human health, the economy, or the environment. These species are termed “invasive plants” or “noxious weeds”. There has been a tremendous expansion of invasive species across the US, including San Luis Obispo County. New problem invasive plant species arrive in San Luis Obispo every year. Invasive plants create large economic losses for agriculture in both cropland and rangeland situations. Noxious weeds often provide poorer habitat for wildlife than native vegetation and can alter ecosystem processes and threaten certain native species with extirpation. Thus, unchecked noxious weeds threaten our economic livelihood and our biological heritage.

Invasive plants are rapidly becoming one of the most pressing issues for natural resource managers. Unfortunately, most natural areas contain many alien plant species. In the vast majority of cases, there are not enough resources to control all exotic species that occur in a natural area forcing land managers to choose which invasive species they will control and which they will not, at least initially.

2. OVERVIEW OF INTEGRATED VEGETATION MANAGEMENT PLAN

2.1. General Management Philosophy

The City of San Luis Obispo follows an Integrated Pest Management (IPM) approach as identified in the *City of San Luis Obispo Open Space Lands Conservation Guidelines* (http://www.slocity.org/Home/ShowDocument?id=5911) for natural resource management. IPM is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment.

There are four underlying principles of an IPM program (http://www.ipm.ucdavis.edu/GENERAL/whatisipm.html).

1. *IPM is based on scientific research*
2. *IPM focuses on long-term prevention of pests or their damage by managing the ecosystem*
3. *In IPM, monitoring and correct pest identification help you decide whether management is needed*
4. *IPM programs combine management approaches for greater effectiveness*

These IPM principles are combined to create IPM programs. While each situation is different, five major components are common to all IPM programs (Flint & Gouveia, 2001):

1. *Pest identification* – correctly identifying the pest is critical to determining if a pest is likely to become a problem and evaluating the best management strategy.

2. *Field monitoring and population assessment* – once pests are identified, it is essential to map and assess the extent of the infestation and the effect it is having on management goals. Field monitoring helps evaluate if a pest is increasing or decreasing and whether future control actions will be needed. Over the years, these records provide valuable historical data for long-term pest management.

3. *Guidelines for when management action is needed* – control action guidelines help decide whether management actions, including pesticide applications, are needed to avoid eventual loss from pest damage. They are useful only when combined with careful field monitoring and accurate pest identification. For agriculture systems there are usually numerical thresholds to trigger management actions. They are intended to reflect the population level that will cause economic damage. When dealing with invasive plants in wildland areas, an ecological threshold that would reflect when the population level will cause ecological damage is used instead of an economic threshold. Unfortunately, ecological impact thresholds are seldom known so guidelines must be based on other factors. These are usually based on perceived potential impact, size and location of infestations, future cost if not controlled and potential for success.

4. *Preventing pest problems* – because control costs can become very high, especially once a pest is well established, preventing invasive species from getting introduced can be the best use of available resources. Using practices that prevent problems is basic to IPM.

5. *Integrating biological, chemical, cultural, and physical/mechanical management tools* – A variety of pest control tools are available for any given pest. Most pest control tools do not eliminate all pest individuals, only a percentage of the population. Many are effective against one stage but ineffective against another stage. For good control, it is essential to evaluate all the tools available for their efficiency at controlling the pest population while minimizing adverse impacts to our conservation targets, the environment and human health. In most cases, many tools and techniques integrated together will produce the most desired results. Typically, management tools fit into one of four major categories:

    a. *Biological Control* – Broadly defined, biological control is any activity of one species that reduces the adverse effect of other species. For invasive plants, biological control can be provided by herbivores, insects or plant pathogens.
    b. *Cultural Control* – Cultural controls are the modification of landscape management practices to decrease pest establishment, reproduction, dispersal, and survival. Grazing and fire management strategies fall under this category.
    c. *Mechanical and Physical Control* – These are measures specifically taken to kill the pest directly or to indirectly make the environment unsuitable for pest entry, dispersal, survival, or reproduction. Weak links in the pest's life cycle or specific behavioral patterns are often targeted. Examples include flaming, tarping, soil solarization, and mechanical removal with a weed wrench.

d. *Chemical Control* – Chemical control is the use of pesticides. In IPM, pesticides are used only when needed and in combination with other approaches for more effective, long-term control. Also, pesticides are selected and applied in a way that minimizes their possible harm to people and the environment. With IPM you'll use the most selective pesticide that will do the job and be the safest for other organisms and for air, soil, and water quality; use pesticides in bait stations rather than sprays; or spot-spray a few weeds instead of an entire area.

This Integrated Vegetation Management Plan outlines an IPM Program for Weed control as part of the overall site management for City of San Luis Obispo Open Space Areas. The focus is on the species and communities desired in place of the weed species, rather than on simply eliminating weeds. The City will implement preventative programs to keep the site free of species that are not yet established there but which are known to be pests elsewhere in the region. Priorities will be set for the control or elimination of weeds that have already established on the site, according to their actual and potential impacts on native species and communities. Action will be taken only when careful consideration indicates leaving the weed unchecked will result in more damage than controlling it with available methods.

2.2. Summary of Specific Actions Planned

Although over 190 non-native plant species have been identified in the Open Space Areas of San Luis Obispo, many become naturalized in native plant communities, and function as native species without obviously altering ecosystem functions. These species are widespread throughout the region, and attempts to control them in City Open Space Areas would be impractical due to constant reintroduction from surrounding lands. Therefore, unless such plants pose a particular threat, they are considered innocuous and are monitored to assess future potential for impact to the ecosystem.

Exotic plants posing major biological/ecological/management threats are identified in this plan, and the most disruptive have been designated as high priority species for management action. An appropriate course of action for each high priority species is determined by the number and location of plants in City Open Space Areas and the region. This plan has four categories of population distribution/density with corresponding management actions:

I. *Present in region but not in SLO City Open Space Areas*. Contact cooperating agencies and landowners. Track spread if near open space area. Prevention of species establishment inside open space areas eliminates the need for control actions.

II. *Present in SLO City Open Space Areas as individuals or small, localized populations*. Remove by hand or other precision control technique, and maintain a record of actions. Monitor the removal sites, following up with additional removal as needed. This kind of diligence keeps control costs low.

III. *Present as large infestations in parts of SLO City Open Space Areas. Native plant communities are disrupted and native species displaced from infested areas*. Remove outliers first. If possible, eliminate the exotic seed bank in outlier areas after mature plants have been removed to deter

re-establishment. Map large infestations. Plan larger attack projects. Resources permitting, implement one or more large-scale projects, aimed as follows:

a. Contain spread to within infested areas.
b. Reduce the number and size of infestations, restore native species to bared sites, and follow a strategy that minimizes dispersal and re-infestation. In general, treat the smallest, furthest outlying areas first.
c. Eliminate the larger infestations, moving from the fringes toward the source of seed dispersal.

IV. *Present as continuous infestations within and beyond SLO City Open Space Area boundaries. Displaces many or all native plants in areas of infestation*. Complete control may be possible, but only by a coordinated, comprehensive effort between the City of SLO and neighboring agencies and land managers. Extensive planning and provision for public comment will be needed. New and applied research may be required before control is possible or cost effective. Ways to share costs of eradication on a regional scale will be pursued. If costs are unreasonable, it may be possible only to restore and protect certain critical open space areas from infestation. Control steps will be similar to III.

3. INVASIVE SPECIES INVENTORY AND PRIORITIZATION

3.1 Non-Native Plant Inventory

An inventory was conducted of non-native plant species on or near City of SLO Open Space Areas (Map 1). Non-native species lists were compiled using the online databases "CalFlora" (http://www.calflora.org) and "CalWeedMapper" (http://calweedmapper.cal-ipc.org). This inventory was supplemented with a cursory on-the-ground surveillance conducted by The Land Conservancy in spring of 2015, knowledge from SLO City Biologists, Natural Resource Managers and Rangers. The inventory was then sent to the San Luis Obispo Weed Management Area Coordinator (Marc Lea) for review. These inventory lists for each open space area are summarized in Table 1.

Table 1. Non-native plant inventories

Location	Scientific Name	Family	Common Name	CAL-IPC Rating	Source
Bishop Peak Natural Reserve	*Anagallis arvensis*	Myrsinaceae	Scarlet pimpernel	Watchlist	Jon Hall personal observation
	Anthemis cotula	Asteraceae	Dog fennel	Watchlist	Calflora
	Avena barbata	Poaceae	Slim oat	Moderate	Jon Hall personal observation
	Avena fatua	Poaceae	Wild oat	Moderate	Calflora
	Bellardia trixago	Orobanchaceae	Mediterranean linseed	Limited	Calflora
	Brassica nigra	Brassicaceae	Black mustard	Moderate	Jon Hall personal observation
	Bromus diandrus	Poaceae	Ripgut brome	Moderate	Jon Hall personal observation
	Bromus madritensis ssp. rubens	Poaceae	Red brome	High	Jon Hall personal observation
	Carduus pycnocephalus	Asteracea	Italian thistle	Moderate	Jon Hall personal observation
	Carthamus lanatus	Asteraceae	Woolly distaff thistle	Moderate-Alert	Calflora
	Centaurea calcitrapa	Asteraceae	Purple starthistle	Moderate	Calflora
	Centaurea iberica	Asteraceae	Iberian knapweed	Watchlist	Calflora
	Centaurea melitensis	Asteraceae	Tocalote	Moderate	Jon Hall personal observation
	Centaurea solstitialis	Asteraceae	Yellow starthistle	High	Bob Hill personal communication
	Chenopodium murale	Chenopodiaceae	Nettle leaf goosefoot		Jon Hall personal observation
	Chondrilla juncea	Asteraceae	Skeleton weed	Moderate	Marc Lea, SLO County Ag Department
	Cynara cardunculus	Asteraceae	Artichoke thistle	Moderate	Jon Hall personal observation
	Cynodon dactylon	Poaceae	Bermuda grass	Moderate	Jon Hall personal observation
	Erodium botrys	Geraniaceae	Big heron bill	Watchlist	Jon Hall personal observation
	Erodium cicutarium	Geraniaceae	Coastal heron's bill	Limited	Jon Hall personal observation
	Festuca myuros	Poaceae	Rattail sixweeks grass	Moderate	Jon Hall personal observation
	Festuca perennis	Poaceae	Italian rye grass	Moderate	Jon Hall personal observation
	Foeniculum vulgare	Apiaceae	Fennel	High	Calflora
	Gastridium phleoides	Asteraceae	Nit grass		Calflora
	Gazania linearis	Asteraceae	Gazania	Moderate-Alert	Jon Hall personal observation
	Hirschfeldia incana	Brassicaceae	Short podded mustard	Moderate	Jon Hall personal observation
	Holcus lanatus	Poaceae	Common velvetgrass	Moderate	Calflora
	Hordeum murinum	Poaceae	Foxtail barley	Moderate	Jon Hall personal observation
	Lamarckia aurea	Poaceae	Goldentop		Jon Hall personal observation
	Malva neglecta	Malvaceae	Common mallow		Jon Hall personal observation
	Malva nicaeensis	Malvaceae	Bull mallow		Calflora
	Matricaria discoidea	Asteraceae	Pineapple weed		Jon Hall personal observation
	Medicago polymorpha	Fabaceae	California burclover	Limited	Jon Hall personal observation
	Paspalum dilatatum	Poaceae	Dallis grass	Watchlist	Calflora
	Plantago lanceolata	Plantaginaceae	English plantain	Limited	Jon Hall personal observation
	Rumex crispus	Polygonaceae	Curly dock	Limited	Jon Hall personal observation
	Senecio vulgaris	Asteraceae	Common groundsel		Jon Hall personal observation
	Sherardia arvensis	Rubiaceae	Field madder		Calflora
	Sinapsis arvensis	Brassicaceae	Charlock	Limited	Calflora
	Soliva sessilis	Asteraceae	South American soliva		Calflora
	Sonchus asper	Asteraceae	Spiny sowthistle	Watchlist	Jon Hall personal observation
	Sonchus oleraceus	Asteraceae	Common sowthistle		Jon Hall personal observation
	Spergularia rubra	Caryophyllaceae	Purple sand spurry		Calflora
	Spergularia villosa	Caryophyllaceae	Villous sand spurry		Calflora
	Stellaria media	Caryophyllaceae	Chickweed		Jon Hall personal observation
	Trifolium hirtum	Fabaceae	Rose clover	Limited	Jon Hall personal observation
	Triticum aestivum	Poaceae	Common wheat		Jon Hall personal observation

Location	Scientific Name	Family	Common Name	CAL-IPC Rating	Source
Bob Jones Bike Trail	*Avena barbata*	Poaceae	Slim oat	Moderate	Jon Hall personal observation
	Avena fatua	Poaceae	Wild oat	Moderate	Calflora
	Brassica nigra	Brassicaceae	Black mustard	Moderate	Jon Hall personal observation
	Brassica rapa	Brassicaceae	Bird's rape mustard	Limited	Jon Hall personal observation
	Bromus diandrus	Poaceae	Ripgut brome	Moderate	Jon Hall personal observation
	Bromus hordeaceus	Poaceae	Soft chess	Limited	Jon Hall personal observation
	Bromus madritensis ssp. rubens	Poaceae	Red brome	High	Jon Hall personal observation
	Carduus pycnocephalus	Asteracea	Italian thistle	Moderate	Jon Hall personal observation
	Centaurea calcitrapa	Asteraceae	Purple starthistle	Moderate	Calflora
	Conium maculatum	Apiaceae	Poison hemlock	Moderate	Jon Hall personal observation
	Delairea odorata	Asteraceae	Cape ivy	High	Calflora
	Erigeron bonariensis	Asteraceae	Flax-leaved horseweed		Calflora
	Erodium cicutarium	Geraniaceae	Coastal heron's bill	Limited	Jon Hall personal observation
	Erodium moschatum	Geraniaceae	Whitestern filaree	Watchlist	Jon Hall personal observation
	Euphorbia peplus	Euphorbiaceae	Petty spurge		Jon Hall personal observation
	Festuca myuros	Poaceae	Rattail sixweeks grass	Moderate	Jon Hall personal observation
	Foeniculum vulgare	Apiaceae	Fennel	High	Jon Hall personal observation
	Fumaria capreolata	Papaveraceae	White ramping fumitory	Watchlist	Jon Hall personal observation
	Hirschfeldia incana	Brassicaceae	Short podded mustard	Moderate	Jon Hall personal observation
	Hordeum murinum	Poaceae	Foxtail barley	Moderate	Jon Hall personal observation
	Hypochaeris radicata	Asteraceae	Hairy cat's ear	Moderate	Jon Hall personal observation
	Lactuca serriola	Asteraceae	Prickly lettuce	Watchlist	Jon Hall personal observation
	Lepidium draba	Brassicaceae	Whitetop	Moderate	Jon Hall personal observation
	Malva nicaeensis	Malvaceae	Bull mallow		Jon Hall personal observation
	Marrubium vulgare	Lamiaceae	White horehound	Limited	Jon Hall personal observation
	Melilotus indicus	Fabaceae	Annual yellow sweetclover		Jon Hall personal observation
	Phoenix canariensis	Arecaceae	Canary Island date palm	Limited	Jon Hall personal observation
	Picris echioides	Asteraceae	Bristly oxtongue	Limited	Jon Hall personal observation
	Plantago lanceolata	Plantaginaceae	English plantain	Limited	Jon Hall personal observation
	Pseudognaphalium luteoalbum	Asteraceae	Jersey cudweed		Jon Hall personal observation
	Raphanus sativus	Brassicaceae	Wild radish	Limited	Jon Hall personal observation
	Ricinus communis	Euphorbiaceae	Castor bean	Limited	Jon Hall personal observation
	Rubus ulmifolius var. anoplothyrsus	Rosaceae	Elmleaf bramble	Watchlist	Jon Hall personal observation
	Rumex crispus	Polygonaceae	Curly dock	Limited	Jon Hall personal observation
	Schinus molle	Anacardiaceae	Peruvian pepper tree	Limited	Jon Hall personal observation
	Silybum marianum	Asteraceae	Milk thistle	Limited	Jon Hall personal observation
	Sonchus asper	Asteraceae	Spiny sowthistle	Watchlist	Jon Hall personal observation
	Sonchus oleraceus	Asteraceae	Common sowthistle	Watchlist	Jon Hall personal observation
	Stipa miliacea var. miliacea	Poaceae	Smilo grass	Limited	Jon Hall personal observation
	Taraxacum officinale	Asteraceae	Dandelion		Jon Hall personal observation
	Tropaeolum majus	Tropaeolaceae	Garden nasturtium		Jon Hall personal observation
	Vinca major	Apocynaceae	Vinca	Moderate	Jon Hall personal observation

Location	Scientific Name	Family	Common Name	CAL-IPC Rating	Source
Cerro San Luis Natural Reserve	*Avena barbata*	Poaceae	Slim oat	Moderate	Jon Hall personal observation
	Avena fatua	Poaceae	Wild oat	Moderate	Jon Hall personal observation
	Brassica nigra	Brassicaceae	Black mustard	Moderate	Jon Hall personal observation
	Bromus diandrus	Poaceae	Ripgut brome	Moderate	Jon Hall personal observation
	Bromus hordeaceus	Poaceae	Soft chess	Limited	Jon Hall personal observation
	Bromus madritensis ssp. Rubens	Poaceae	Red brome	High	Jon Hall personal observation
	Carduus pycnocephalus	Asteracea	Italian thistle	Moderate	Jon Hall personal observation
	Carpobrotus edulis	Aizoaceae	Iceplant	High	Jon Hall personal observation
	Centaurea calcitrapa	Asteracea	Purple starthistle	Moderate	Jon Hall personal observation
	Centaurea melitensis	Asteraceae	Tocalote	Moderate	Jon Hall personal observation
	Centaurea solstitialis	Asteraceae	Yellow starthistle	High	Jon Hall personal observation
	Cirsium vulgare	Asteraceae	Bull thistle	Moderate	Jon Hall personal observation
	Cotoneaster pannosus	Rosaceae	Woolly cotoneaster	Moderate	Calflora
	Dipsacus fullonum	Dipsacaceae	Fuller's teasel	Moderate	Jon Hall personal observation
	Erodium botrys	Geraniaceae	Big heron bill	Watchlist	Jon Hall personal observation
	Erodium cicutarium	Geraniaceae	Coastal heron's bill	Limited	Jon Hall personal observation
	Festuca perennis	Poaceae	Italian rye grass	Moderate	Jon Hall personal observation
	Foeniculum vulgare	Apiaceae	Fennel	High	Jon Hall personal observation
	Genista monspessulana	Fabaceae	French Broom	High	Jon Hall personal observation
	Hirschfeldia incana	Brassicaceae	Short podded mustard	Moderate	Jon Hall personal observation
	Hordeum murinum	Poaceae	Foxtail barley	Moderate	Jon Hall personal observation
	Lamarckia aurea	Poaceae	Goldentop		Jon Hall personal observation
	Lamium purpureum	Lamiaceae	Purple dead nettle		Calflora - on top of mountain, not in open space
	Marrubium vulgare	Lamiaceae	White horehound	Limited	Jon Hall personal observation
	Oxalis pes-caprae	Oxalidaceae	Sourgrass	Moderate	Jon Hall personal observation
	Pennisetum setaceum	Poaceae	Fountaingrass	Moderate	Calflora
	Pennisetum villosum	Poaceae	Feathertop	Watchlist	Jon Hall personal observation
	Picris echioides	Asteraceae	Bristly oxtongue	Limited	Jon Hall personal observation
	Plantago lanceolata	Plantaginaceae	English plantain	Limited	Jon Hall personal observation
	Ratibida columnifera	Asteraceae	Upright praire coneflower		Calflora
	Rumex crispus	Polygonaceae	Curly dock	Limited	Jon Hall personal observation
	Schinus molle	Anacardiaceae	Peruvian pepper tree	Limited	Jon Hall personal observation
	Silybum marianum	Asteraceae	Milk thistle	Limited	Jon Hall personal observation
	Sonchus asper	Asteraceae	Spiny sowthistle	Watchlist	Jon Hall personal observation

Location	Scientific Name	Family	Common Name	CAL-IPC Rating	Source
Filipponi Ecological Reserve	*Anagallis arvensis*	Myrsinaceae	Scarlet pimpernel	Watchlist	Jon Hall personal observation
	Avena fatua	Poaceae	Wild oat	Moderate	Jon Hall personal observation
	Brassica nigra	Brassicaceae	Black mustard	Moderate	Jon Hall personal observation
	Brassica rapa	Brassicaceae	Bird's rape mustard	Limited	Jon Hall personal observation
	Bromus diandrus	Poaceae	Ripgut brome	Moderate	Jon Hall personal observation
	Bromus hordaceus	Poaceae	Soft chess	Limited	Jon Hall personal observation
	Bromus madritensis ssp. rubens	Poaceae	Red brome	High	Jon Hall personal observation
	Carduus pycnocephalus	Asteraceae	Italian thistle	Moderate	Jon Hall personal observation
	Centaurea melitensis	Asteraceae	Tocalote	Moderate	Jon Hall personal observation
	Conium maculatum	Apiaceae	Poison hemlock	Moderate	Jon Hall personal observation
	Dipsacus fullonum	Dipsacaceae	Fuller's teasel	Moderate	Jon Hall personal observation
	Erodium cicutarium	Geraniaceae	Coastal heron's bill	Limited	Jon Hall personal observation
	Erodium moschatum	Geraniaceae	Whitestern filaree		Jon Hall personal observation
	Euphorbia peplus	Euphorbiaceae	Petty spurge		Jon Hall personal observation
	Festuca myuros	Poaceae	Rattail sixweeks grass	Moderate	Jon Hall personal observation
	Festuca perennis	Poaceae	Italian rye grass	Watchlist	Jon Hall personal observation
	Foeniculum vulgare	Apiaceae	Fennel	High	Jon Hall personal observation
	Fumaria capreolata	Papaveraceae	White ramping fumitory	Watchlist	Jon Hall personal observation
	Geranium dissectum	Geraniaceae	Wild geranium	Limited	Jon Hall personal observation
	Hirschfeldia incana	Brassicaceae	Short podded mustard	Moderate	Jon Hall personal observation
	Hordeum murinum	Poaceae	Foxtail barley	Moderate	Jon Hall personal observation
	Lactuca serriola	Asteraceae	Prickly lettuce	Watchlist	Jon Hall personal observation
	Lepidium draba	Brassicaceae	Whitetop	Moderate	Jon Hall personal observation
	Malva neglecta	Malvaceae	Common mallow		Jon Hall personal observation
	Medicago polymorpha	Fabaceae	California burclover	Limited	Jon Hall personal observation
	Melilotus indicus	Fabaceae	Annual yellow sweetclover		Jon Hall personal observation
	Picris echioides	Asteraceae	Bristly ox-tongue	Limited	Jon Hall personal observation
	Raphanus sativus	Brassicaceae	Wild radish	Limited	Jon Hall personal observation
	Rumex crispus	Polygonaceae	Curly dock	Limited	Jon Hall personal observation
	Schinus molle	Anacardiaceae	Peruvian pepper tree	Limited	Jon Hall personal observation
	Silybum marianum	Asteraceae	Milk thistle	Limited	Jon Hall personal observation
	Sonchus asper	Asteraceae	Spiny sowthistle	Watchlist	Jon Hall personal observation
	Sonchus oleraceus	Asteraceae	Common sowthistle	Watchlist	Jon Hall personal observation

Location	Scientific Name	Family	Common Name	CAL-IPC Rating	Source
Irish Hills Natural Reserve	*Ailanthus altissima*	Simbaroubaceae	Tree-of-heaven	Moderate	Scott Couture personal observation
	Avena barbata	Poaceae	Slim oat	Moderate	Jon Hall personal observation
	Avena fatua	Poaceae	Wild oat	Moderate	Jon Hall personal observation
	Briza maxima	Poaceae	Rattlesnake grass	Limited	Calflora
	Carduus pycnocephalus	Asteracea	Italian thistle	Moderate	Jon Hall personal observation
	Carthamus lanatus	Asteraceae	Woolly distaff thistle	Moderate-Alert	Dan Dixon, personal observation
	Centaurea melitensis	Asteraceae	Tocalote	Moderate	Jon Hall personal observation
	Centaurea solstitialis	Asteraceae	Yellow starthistle	High	Scott Couture personal observation
	Conium maculatum	Apiaceae	Poison hemlock	Moderate	Jon Hall personal observation
	Cortaderia jubata	Poaceae	Jubata grass	High	Jon Hall personal observation
	Delairea odorata	Asteraceae	Cape ivy	High	Dan Dixon, personal observation
	Erigeron bonariensis	Asteraceae	Flax-leaved horseweed		Calflora
	Erodium cicutarium	Geraniaceae	Coastal heron's bill	Limited	Jon Hall personal observation
	Erodium moschatum	Geraniaceae	Whitestern filaree		Jon Hall personal observation
	Gazania linearis	Asteraceae	Gazania	Moderate-Alert	Scott Couture personal observation
	Genista monspessulana	Fabaceae	French broom	High	Jon Hall personal observation
	Lamarckia aurea	Poaceae	Goldentop		Calflora
	Lathyrus latifolius	Fabaceae	Sweet pea	Watchlist	Calflora
	Medicago minima	Fabaceae	Small bur clover		Calflora
	Medicago polymorpha	Fabaceae	California bur clover	Limited	Calflora
	Mentha aquatica	Lamiaceae	Water mint		Calflora
	Oxalis pes-caprae	Oxalidaceae	Sourgrass	Moderate	Jon Hall personal observation
	Papaver somniferum	Papaveraceae	Opium poppy		Calflora
	Pennisetum clandestinum	Poaceae	Kikuyugrass	Limited	Dan Dixon, personal observation
	Phoenix canariensis	Arecaceae	Canary Island date palm	Limited	Dan Dixon, personal observation
	Plantago lanceolata	Plantaginaceae	English plantain	Limited	Jon Hall personal observation
	Rubus armeniacus	Rosaceae	Himalayan blackberry	High	Dan Dixon, personal observation
	Silybum marianum	Asteraceae	Milk thistle	Limited	Jon Hall personal observation
	Sorghum bicolor	Poaceae	Sorghum		Calflora
	Vinca major	Apocynaceae	Vinca	Moderate	Jon Hall personal observation

Location	Scientific Name	Family	Common Name	CAL-IPC Rating	Source
Johnson Ranch Open Space	*Asphodelus fistulosus*	Asphodelaceae	Onion weed	Moderate-Alert	Dan Dixon, personal observation
	Avena fatua	Poaceae	Wild oat	Moderate	Jon Hall personal observation
	Brassica nigra	Brassicaceae	Black mustard	Moderate	Jon Hall personal observation
	Bromus diandrus	Poaceae	Ripgut brome	Moderate	Jon Hall personal observation
	Bromus hordaceus	Poaceae	Soft chess	Limited	Jon Hall personal observation
	Bromus madritensis ssp. rubens	Poaceae	Red brome	High	Jon Hall personal observation
	Carduus pycnocephalus	Asteraceae	Italian thistle	Moderate	Jon Hall personal observation
	Carthamus lanatus	Asteraceae	Woolly distaff thistle	Moderate-Alert	Calflora
	Centaurea melitensis	Asteraceae	Tocalote	Moderate	Jon Hall personal observation
	Chenopodium murale	Chenopodiaceae	Nettle leaf goose foot		Jon Hall personal observation
	Cortaderia jubata	Poaceae	Jubata grass	High	Marc Lea, SLO County Ag Department
	Dipsacus fullonum	Dipsacaceae	Fuller's teasel	Moderate	Dan Dixon, personal observation
	Erodium botrys	Geraniaceae	Big heron bill	Watchlist	Jon Hall personal observation
	Erodium cicutarium	Geraniaceae	Coastal heron's bill	Limited	Jon Hall personal observation
	Festuca perennis	Poaceae	Italian rye grass	Watchlist	Jon Hall personal observation
	Foeniculum vulgare	Apiaceae	Fennel	High	Jon Hall personal observation
	Hirschfeldia incana	Brassicaceae	Short podded mustard	Moderate	Jon Hall personal observation
	Hordeum murinum	Poaceae	Foxtail barley	Moderate	Jon Hall personal observation
	Lactuca serriola	Asteraceae	Prickly lettuce	Watchlist	Jon Hall personal observation
	Lepidium draba	Brassicaceae	Whitetop	Moderate	Jon Hall personal observation
	Malva neglecta	Malvaceae	Common mallow		Jon Hall personal observation
	Marubium vulgare	Lamiaceae	White horehound	Limited	Dan Dixon, personal observation
	Matricaria discoidea	Asteraceae	Pineapple weed		Jon Hall personal observation
	Medicago polymorpha	Fabaceae	California burclover	Limited	Jon Hall personal observation
	Melilotus indicus	Fabaceae	Annual yellow sweetclover		Jon Hall personal observation
	Nicotiana glauca	Solanaceae	Tree tobacco	Moderate	Dan Dixon, personal observation
	Oxalis pes-caprae	Oxalidaceae	Sourgrass	Moderate	Jon Hall personal observation
	Picris echioides	Asteraceae	Bristly ox-tongue	Limited	Jon Hall personal observation
	Rubus armeniacus	Rosaceae	Himalayan blackberry	High	Dan Dixon, personal observation
	Rumex crispus	Polygonaceae	Curly dock	Limited	Jon Hall personal observation
	Silybum marianum	Asteraceae	Milk thistle	Limited	Jon Hall personal observation
	Sonchus asper	Asteraceae	Spiny sowthistle	Watchlist	Jon Hall personal observation
	Sonchus oleraceus	Asteraceae	Common sowthistle	Watchlist	Jon Hall personal observation
	Urtica urens	Urticaceae	dwarf nettle		Dan Dixon, personal observation

Location	Scientific Name	Family	Common Name	CAL-IPC Rating	Source
Laguna Lake Natural Reserve	*Amaryllis belladonna*	Amaryllidaceae	Naked lady		Calflora
	Anagallis arvensis	Myrsinaceae	Scarlet pimpernel	Watchlist	Calflora
	Anthemis cotula	Asteraceae	Dog fennel	Watchlist	Calflora
	Araujia sericifera	Apocynaceae	Bladderflower		Calflora
	Avena barbata	Poaceae	Slim oat	Moderate	Jon Hall personal observation
	Avena fatua	Poaceae	Wild oat	Moderate	Calflora
	Bellardia trixago	Orobanchaceae	Mediterranean linseed	Limited	Calflora
	Brassica nigra	Brassicaceae	Black mustard	Moderate	Calflora
	Bromus diandrus	Poaceae	Ripgut brome	Moderate	Calflora
	Bromus hordeaceus	Poaceae	Soft chess	Limited	Calflora
	Bromus madritensis ssp. rubens	Poaceae	Red brome	High	Calflora
	Centaurea calcitrapa	Asteracea	Purple starthistle	Moderate	Jon Hall personal observation
	Centaurea melitensis	Asteraceae	Tocalote	Moderate	Jon Hall personal observation
	Chondrilla juncea	Asteraceae	Skeleton weed	Moderate	Calflora
	Cirsium vulgare	Asteraceae	Bullthistle	Moderate	Calflora
	Conium maculatum	Apiaceae	Poison hemlock	Moderate	Jon Hall personal observation
	Cortaderia jubata	Poaceae	Jubata grass	High	Marc Lea, SLO County Ag Department
	Daucus carota	Apiaceae	Carrot	Watchlist	Calflora
	Digitaria ischaemum	Poaceae	Smooth crabgrass		Calflora
	Dipsacus sativus	Dipsacaceae	Indian teasel	Moderate	Calflora
	Drosanthemum floribundum	Aizoaceae	Rosy ice plant		Calflora
	Dysphania ambrosioides	Chenopodiaceae	Mexican tea		Calflora
	Erodium botrys	Geraniaceae	Big heron bill	Watchlist	Calflora
	Erodium cicutarium	Geraniaceae	Coastal heron's bill	Limited	Calflora
	Erodium moschatum	Geraniaceae	Whitestern filaree	Watchlist	Calflora
	Eucalyptus globulus	Myrtaceae	Tasmanian bluegum	Limited	Calflora
	Eucalyptus polyanthemos	Myrtaceae	Silver dollar gum		Calflora
	Eucalyptus viminalis	Myrtaceae	Manna gum		Calflora
	Euphorbia peplus	Euphorbiaceae	Petty spurge		Jon Hall personal observation
	Festuca bromoides	Poaceae	Brome fescue	Watchlist	Calflora
	Festuca myuros	Poaceae	Rattail sixweeks grass	Moderate	Calflora
	Festuca perennis	Poaceae	Italian rye grass	Watchlist	Calflora
	Foeniculum vulgare	Apiaceae	Fennel	High	Calflora
	Genista monspessulana	Fabaceae	French broom	High	Scott Couture, personal observation
	Geranium dissectum	Geraniaceae	Wild geranium	Limited	Calflora
	Hedypnois cretica	Asteraceae	Crete weed	Watchlist	Calflora
	Helminthotheca echioides	Asteraceae	Bristly ox-tongue	Limited	Calflora
	Hirschfeldia incana	Brassicaceae	Short podded mustard	Moderate	Calflora
	Hordeum marinum	Poaceae	Seaside barley	Moderate	Calflora
	Hordeum murinum ssp. leporinum	Poaceae	Farmer's foxtail	Moderate	Calflora
	Hypochaeris glabra	Asteraceae	Smooth cat's ear	Limited	Calflora
	Hypochaeris radicata	Asteraceae	Hairy cat's ear	Moderate	Calflora
	Lactuca saligna	Asteraceae	Willow lettuce	Watchlist	Calflora
	Lamium amplexicaule	Lamiaceae	Henbit		Calflora
	Lotus corniculatus	Fabaceae	Bird's foot trefoil	Watchlist	Calflora
	Lythrum hyssopifolia	Lythraceae	Hyssop loosestrife	Limited	Calflora
	Malva neglecta	Malvaceae	Common mallow		Jon Hall personal observation
	Malva pseudolavatera	Malvaceae	Cretan mallow		Calflora
	Matricaria discoidea	Asteraceae	Pineapple weed		Jon Hall personal observation
	Maytenus boaria	Celastraceae	Mayten	Watchlist	Calflora
	Medicago polymorpha	Fabaceae	California burclover	Limited	Calflora
	Melilotus indicus	Fabaceae	Annual yellow sweetclover		Calflora
	Oxalis latifolia	Oxalidaceae	Mexican oxalis		Calflora
	Panicum dichotomiflorum ssp. dichotomiflorum	Poaceae	Fall panic grass		Calflora
	Pennisetum setaceum	Poaceae	Fountaingrass	Moderate	Calflora
	Phalaris aquatica	Poaceae	Harding grass	Moderate	Jon Hall personal observation
	Plantago lanceolata	Plantaginaceae	Ribwort		Calflora
	Plantago major	Plantaginaceae	Common plantain		Calflora
	Polygonum aviculare	Polygonaceae	Prostrate knotweed		Jon Hall personal observation
	Polypogon interruptus	Poaceae	Ditch beard grass	Watchlist	Calflora
	Pyracantha angustifolia	Rosaceae	Firethorn	Limited	Calflora
	Raphanus sativus	Brassicaceae	Wild radish	Limited	Calflora
	Rumex acetosella	Polygonaceae	Sheep sorrel	Moderate	Calflora
	Rumex crispus	Polygonaceae	Curly dock	Limited	Jon Hall personal observation
	Scandix pecten-veneris	Apiaceae	Shepherd's needle		Calflora
	Silene gallica	Caryophyllaceae	Common catchfly		Calflora
	Silybum marianum	Asteraceae	Milk thistle	Limited	Calflora
	Sonchus asper	Asteraceae	Spiny sowthistle	Watchlist	Calflora
	Sonchus oleraceus	Asteraceae	Common sowthistle	Watchlist	Calflora
	Sporobolus indicus	Poaceae	Smutgrass	Watchlist	Calflora
	Stipa brachychaeta	Poaceae	Puna needle grass		Calflora
	Tamarix sp.	Tamaraciceae	Saltcedar	High	Bob Hill, SLO City
	Tragopogon porrifolius	Asteraceae	Salsify	Watchlist	Calflora
	Triticum aestivum	Poaceae	Common wheat		Jon Hall personal observation
	Veronica anagallis-aquatica	Plantaginaceae	Water speedwell		Calflora
	Vicia benghalensis	Fabaceae	Purple vetch		Calflora
	Vicia hirsuta	Fabaceae	Hairy vetch		Calflora
	Vicia villosa ssp. varia	Fabaceae	Smooth vetch		Calflora
	Vicia villosa ssp. Villosa	Fabaceae	Hairy vetch		Calflora

Location	Scientific Name	Family	Common Name	CAL-IPC Rating	Source
Reservoir Canyon Natural Reserve	*Ageratina adenophora*	Asteraceae	Sticky snakeroot	Moderate	Dan Dixon, personal observation
	Anagallis arvensis	Myrsinaceae	Scarlet pimpernel	Watchlist	Calflora
	Avena barbata	Poaceae	Slim oat	Moderate	Calflora
	Avena fatua	Poaceae	Wild oat	Moderate	Calflora
	Brachypodium distachyon	Poaceae	Purple false brome	Moderate	Calflora
	Brassica negra	Brassicaceae	Black mustard	Moderate	Calflora
	Bromus diandrus	Poaceae	Ripgut brome	Moderate	Calflora
	Bromus hordeaceus	Poaceae	Soft chess	Limited	Calflora
	Bromus madritensis ssp. rubens	Poaceae	Red brome	High	Calflora
	Carduus pycnocephalus	Asteraceae	Italian thistle	Moderate	Calflora
	Centaurea melitensis	Asteraceae	Tocalote	Moderate	Calflora
	Conium maculatum	Apiaceae	Poison hemlock	Moderate	Calflora
	Cynodon dactylon	Poaceae	Bermuda grass	Moderate	Jon Hall personal observation
	Ehrharta erecta	Poaceae	Panic veldtgrass	Moderate	Jon Hall personal observation
	Erigeron bonariensis	Asteraceae	Flax-leaved horseweed		Calflora
	Erodium botrys	Geraniaceae	Big heron bill	Watchlist	Calflora
	Erodium cicutarium	Geraniaceae	Coastal heron's bill	Limited	Calflora
	Erodium moschatum	Geraniaceae	Whitestem filaree	Watchlist	Calflora
	Eucalyptus globulus	Myrtaceae	Tasmanian bluegum	Moderate	Jon Hall personal observation
	Euphorbia peplus	Euphorbiaceae	Petty spurge		Jon Hall personal observation
	Festuca myuros	Poaceae	Rattail sixweeks grass	Moderate	Calflora
	Festuca perennis	Poaceae	Italian rye grass	Moderate	Calflora
	Foeniculum vulgare	Apiaceae	Fennel	High	Calflora
	Gastridium pheloides	Poaceae	Nit grass		Calflora
	Genista monspessulana	Fabaceae	French broom	High	Calflora
	Geranium dissectum	Geraniaceae	Wild geranium	Limited	Calflora
	Hirschfeldia incana	Brassicaceae	Short podded mustard	Moderate	Calflora
	Hordeum murinum	Poaceae	Foxtail barley		Calflora
	Hyphochaeris glabra	Asteraceae	Smooth cat's ear	Limited	Calflora
	Lactuca saligna	Asteraceae	Willow lettuce		Calflora
	Lamarckia aurea	Poaceae	Goldentop		Calflora
	Logfia gallica	Asteraceae	Narrowleaf cottonrose		Calflora
	Malva nicaeensis	Malvaceae	Bull mallow		Calflora
	Malva parviflora	Malvaceae	Cheeseweed		Calflora
	Marrubium vulgare	Lamiaceae	White horehound	Limited	Jon Hall personal observation
	Matricaria discoidea	Asteraceae	Pineapple weed		Calflora
	Medicago polymorpha	Fabaceae	California burclover	Limited	Calflora
	Melilotus indicus	Fabaceae	Annual yellow sweetclover	Watchlist	Calflora
	Oxalis pes-caprae	Oxalidaceae	Sourgrass	Moderate	Jon Hall personal observation
	Phalaris pardoxa	Poaceae	Hood canarygrass		Calflora
	Pittosporum undulatum	Pittosporaceae	Victorian box	Watchlist	Calflora
	Plantago lanceolata	Plantaginaceae	English plantain	Limited	Jon Hall personal observation
	Poa annua	Poaceae	Annual blue grass	Watchlist	Calflora
	Polygonum aviculare ssp. depressum	Polygonaceae	Prostrate knotweed		Calflora
	Polypogon interruptus	Poaceae	Ditch beard grass	Watchlist	Calflora
	Polypogon monspeliensis	Poaceae	Annual beard grass		Calflora
	Polypogon viridis	Poaceae	Water beard grass		Calflora
	Prunus dulcis	Rosaceae	Almond		Calflora
	Pseudognaphalium luteoalbum	Asteraceae	Jersey cudweed		Calflora
	Raphanus sativus	Brassicaceae	Jointed charlock	Limited	Calflora
	Rumex crispus	Polygonaceae	Curly dock	Limited	Calflora
	Silybum marianum	Asteraceae	Milk thistle	Limited	Calflora
	Sisymbrium officinale	Brassicaceae	Hedge mustard		Calflora
	Sonchus asper	Asteraceae	Spiny sowthistle	Watchlist	Calflora
	Sonchus oleraceus	Asteraceae	Common sowthistle	Watchlist	Calflora
	Stellaria media	Caryophyllaceae	Chickweed		Calflora
	Torilis nodosa	Apiaceae	Wild parsley	Watchlist	Calflora
	Trifolium hirtum	Fabaceae	Rose clover	Limited	Calflora
	Tropaeolum majus	Tropaeolaceae	Garden nasturtium	Watchlist	Calflora
	Vicia sativa ssp. sativa	Fabaceae	Common vetch		Calflora
	Vicia villosa ssp. varia	Fabaceae	Smooth vetch		Calflora

Location	Scientific Name	Family	Common Name	CAL-IPC Rating	Source
South Hills Natural Reserve	*Asparagus asparagoides*	Asparagaceae	African asparagus fern	Moderate-Alert	Jon Hall personal observation
	Avena barbata	Poaceae	Slim oat	Moderate	Jon Hall personal observation
	Avena fatua	Poaceae	Wild oat	Moderate	Jon Hall personal observation
	Bromus diandrus	Poaceae	Ripgut brome	Moderate	Calflora
	Bromus madritensis ssp. Rubens	Poaceae	Red brome	High	Jon Hall personal observation
	Erodium cicutarium	Geraniaceae	Coastal heron's bill	Limited	Jon Hall personal observation
	Eucalyptus globulus	Myrtaceae	Tasmanian bluegum	Limited	Calflora
	Euphorbia peplus	Euphorbiaceae	Petty spurge		Jon Hall personal observation
	Festuca perennis	Poaceae	Italian rye grass	Moderate	Jon Hall personal observation
	Foeniculum vulgare	Apiaceae	Fennel	High	Jon Hall personal observation
	Genista monspessulana	Fabaceae	French broom	High	Jon Hall personal observation
	Matricaria discoidea	Asteraceae	Pineapple weed		Jon Hall personal observation
	Medicago polymorpha	Fabaceae	California burclover	Limited	Jon Hall personal observation
	Nicotiana glauca	Solanaceae	Tree tobacco	Moderate	Jon Hall personal observation
	Oxalis pes-caprae	Oxalidaceae	Sourgrass	Moderate	Jon Hall personal observation
	Plantago lanceolata	Plantaginaceae	English plantain	Limited	Jon Hall personal observation
	Polygonum aviculare	Polygonaceae	Prostrate knotweed		Jon Hall personal observation
	Rubus armeniacus	Rosaceae	Himalayan blackberry	High	Dan Dixon, personal observation
	Rumex crispus	Polygonaceae	Curly dock	Limited	Jon Hall personal observation
	Schinus molle	Anacardiaceae	Peruvian pepper tree	Limited	Jon Hall personal observation
	Sonchus asper	Asteraceae	Spiny sowthistle	Watchlist	Jon Hall personal observation
	Sonchus oleraceus	Asteraceae	Common sowthistle	Watchlist	Jon Hall personal observation

Location	Scientific Name	Family	Common Name	CAL-IPC Rating	Source
Stenner Springs Natural Reserve	*Avena barbata*	Poacea	Slim oat	Moderate	Jon Hall personal observation
	Brassica nigra	Brassicaceae	Black mustard	Moderate	Jon Hall personal observation
	Bromus diandrus	Poacea	Ripgut brome	Moderate	Jon Hall personal observation
	Bromus hordeaceus	Poacea	Soft chess	Limited	Jon Hall personal observation
	Bromus madritensis	Poacea	Red brome	High	Jon Hall personal observation
	Carduus pycnocephalus	Asteracea	Italian thistle	Moderate	Jon Hall personal observation
	Centaurea calcitrapa	Asteracea	Purple starthistle	Moderate	Jon Hall personal observation
	Centaurea melitensis	Asteracea	Tocalote	Moderate	Jon Hall personal observation
	Centaurea solstitialis	Asteracea	Yellow starthistle	High	Jon Hall personal observation
	Conium maculatum	Apiaceae	Poison hemlock	Moderate	Jon Hall personal observation
	Cortaderia jubata	Poaceae	Jubata grass	High	Marc Lea, SLO County Ag Department
	Erodium cicutarium	Geraniaceae	Coastal heron's bill	Limited	Jon Hall personal observation
	Eucalyptus globulus	Myrtaceae	Tasmanian bluegum	Moderate	Jon Hall personal observation
	Festuca perennis	Poaceae	Italian rye grass	Moderate	Jon Hall personal observation
	Foeniculum vulgare	Apiaceae	Fennel	High	Jon Hall personal observation
	Hirschfeldia incana	Brassicaceae	Short podded mustard	Moderate	Jon Hall personal observation
	Melilotus indicus	Fabaceae	Annual yellow sweetclover	Watchlist	Jon Hall personal observation
	Plantago lanceolata	Plantaginaceae	Ribwort	Limited	Jon Hall personal observation
	Silybum marianum	Asteraceae	Milk thistle	Limited	Jon Hall personal observation
	Sonchus asper	Asteraceae	Spiny sowthistle	Watchlist	Jon Hall personal observation
	Vicia sativa	Fabaceae	Spring vetch		Jon Hall personal observation

Location	Scientific Name	Family	Common Name	CAL-IPC Rating	Source
Terrace Hill Open Space	*Avena barbata*	Poaceae	Slim oat	Moderate	Jon Hall personal observation
	Avena fatua	Poaceae	Wild oat	Moderate	Jon Hall personal observation
	Brassica nigra	Brassicaceae	Black mustard	Moderate	Jon Hall personal observation
	Bromus diandrus	Poaceae	Ripgut brome	Moderate	Jon Hall personal observation
	Chondrilla juncea	Asteraceae	Skeleton weed	Moderate	Calflora
	Cortaderia jubata	Poaceae	Jubata grass	High	Jon Hall personal observation
	Erodium botrys	Geraniaceae	Big heron bill	Watchlist	Jon Hall personal observation
	Erodium cicutarium	Geraniaceae	Coastal heron's bill	Limited	Jon Hall personal observation
	Erodium moschatum	Geraniaceae	Whitestem filaree		Jon Hall personal observation
	Festuca myuros	Poaceae	Rattail sixweeks grass	Moderate	Jon Hall personal observation
	Festuca perennis	Poaceae	Italian rye grass	Moderate	Jon Hall personal observation
	Foeniculum vulgare	Apiaceae	Fennel	High	Calflora
	Genista monspessulana	Fabaceae	French broom	High	Marc Lea, SLO County Ag Department
	Hirschfeldia incana	Brassicaceae	Short podded mustard	Moderate	Jon Hall personal observation
	Hordeum murinum	Poaceae	Foxtail barley	Moderate	Jon Hall personal observation
	Lactuca serriola	Asteraceae	Prickly lettuce	Watchlist	Jon Hall personal observation
	Lamarckia aurea	Poaceae	Goldentop		Jon Hall personal observation
	Malva neglecta	Malvaceae	Common mallow		Jon Hall personal observation
	Medicago polymorpha	Fabaceae	California burclover	Limited	Jon Hall personal observation
	Oxalis pes-caprae	Oxalidaceae	Sourgrass	Moderate	Jon Hall personal observation
	Pennisetum setaceum	Poaceae	Fountaingrass	Moderate	Jon Hall personal observation
	Plantago lanceolata	Plantaginaceae	English plantain	Limited	Jon Hall personal observation
	Taraxacum officinale	Asteraceae	Dandelion		Jon Hall personal observation
	Triticum aestivum	Poaceae	Common wheat		Jon Hall personal observation

3.2 Non-Native Plant Species Prioritization

Non-native plant lists created for each open space area were prioritized for control. To subjectively evaluate invasive plants requiring control, a prioritization scoring matrix developed by Tim Hyland (CA State Parks, Santa Cruz District) was utilized. In this prioritization system, highest priority goes to the combination of greatest potential threat to sensitive resources and ease of control. The prioritization matrix assigns a numerical value in each of the following Categories:

- **Goal**
- **Rate/Likelihood of Spread**
- **Threat to Sensitive Resources**
- **Logistics**
- **Politics**
- **Potential for Success**
- **Eradication dividend**

Goal: A numerical value from 1 to 5 was assigned to each species based on the goal when managing the species. These management goals correspond to different categories of specific actions planned in section 2.2. The highest rating goes to species with incipient population small enough to achieve complete eradication (Eradication). The lowest value is given to species that are so widespread that control would be on-going in perpetuity (Sustained Control).

- Eradication (5) – population is small and isolated enough that complete eradication of all plants and reproductive propagules is possible with little chance of re-introduction (Category II & III).
- Elimination/Zero Density (4) – Population is of high enough priority or small enough size to completely eliminate it from an Open Space Area, but the population is widespread enough that re-introduction is likely (Category III).
- Outlier Control (3) – When populations are present as large infestations in City Open Space Areas, the first priority is to eliminate small outlier populations away from the larger infestation (Category III).
- Perimeter Control (2) – When populations are present as large infestations in City Open Space Areas, once outlier populations have been eliminated, management focus switches to control around the perimeter of the larger infestation moving from the fringes towards the center (Category III).
- Sustained Control (1) – The species is so widespread that elimination from Open Space Areas is unlikely due to population size and pressure of continual reintroduction from neighboring properties. Control areas would most likely focus on specific high priority areas impacted from the species with a long term commitment expected (Category IV).

Rate/Likelihood of Spread: A numerical value from 1 to 3. Does the plant have new areas to move into and possess a high rate of invasion (Score 3), or has it already occupied all suitable niches (Score 1)?

Threat to Sensitive Resources: A numerical value from 1 to 3. A score of 3 means the species poses a severe threat to sensitive resources (listed species or rare habitats). A species that doesn't pose any significant threats to sensitive resources is scored 1. The California Invasive Plant Council (CalIPC) maintains "The California Invasive Plant Inventory" (http://www.cal-ipc.org/ip/inventory), which categorizes non-native invasive plants that threaten the state's wildlands. Categorization is based on an assessment of the ecological impacts of each plant. The Inventory represents the best available knowledge of invasive plant experts in the state. The Inventory categorizes plants as High, Moderate, or Limited, reflecting the level of each species' negative ecological impact in California. This inventory was used to help inform some of the plant ratings for "Threat to Sensitive Resources". A Cal-IPC inventory rating of High would receive a score of 3 and an inventory rating of limited would receive a score of 1.

Logistics: A numerical value from 1 to 3. This category evaluates how difficult it is to control a species. A value of 3 is given to species easy to access with adequate control techniques already known. A value of 1 is given to populations with difficult access and time intensive control techniques. Factors considered for this rating are:

- Distance from base of operations
- Steep slopes
- Accessibility
- Poison oak
- Complexity of control techniques

Politics: A numerical value from 1 to 3. A value of 3 has no political hurdles, good public support (i.e. already worked on by local Agriculture Department or Weed Management Area), and minimal permitting. A value of 1 would go to species with strong public opposition to removal. Some tree species fall into this category, where the public has a strong tie to a "Heritage" tree that is a non-native invasive plant. Politics ratings consider the following factors:

- Multiple Land Owners
- Visibility of Project
- Public Perception
- Permitting
- Other entities interested in helping

Potential for Success: A numerical value from 1 to 3. "Potential for success" evaluates the plant, its population size and distribution and the biology of the species to rate the feasibility of achieving adequacy of control. A species where control is considered to have a high potential for success is given a 3. If the species has an incredibly long lived seed bank, is hard to detect and has no good control options it would receive a lower rating of 1. Factors considered when evaluating the potential for success include:

- Efficacy of Control
- Seed Bank
- Detectability
- Life Cycle
- Likelihood of Reinvasion

Eradication Dividend: A numerical value from 1 to 3. Eradication dividend evaluates the effort required to maintain management. If we don't work on it now, how much is this going to cost us in the future? If the species is a minimal cost to control right now, but could be a big problem with expensive controls in the future, it would receive a rank of 3.

Scoring Matrix –

To build the scoring matrix, the Category "Goal" receives a value from 1 to 5 and all other categories are scored from 1 to 3. Values for each Category are combined to give an overall Prioritization Ranking (Fig. 1). Species scoring the highest priority ranking combine ease of control with severe threats to sensitive resources. Some species may be widespread on one City Open Space but contain only small incipient populations on another. This may lead to different invasive plant management goals for each Open Space Area. Therefore, all species are ranked separately for each Open Space Area (Table 3).

Scientific Name	Family	Common Name	CAL-IPC Rating	Goal Description	Goal	Spread	Threat	Logistics	Politics	Success	Future Cost	Prioritization Ranking
Centaurea solstitialis	Asteraceae	Yellow starthistle	High	Eradication	5	3	3	2	3	2	3	21
Genista monspessulana	Fabaceae	French Broom	High	Outlier Control	3	3	3	1	2	2	3	17
Silybum marianum	Asteraceae	Milk thistle	Limited	Elimination/Zero Density	4	2	2	2	2	2	2	16
Centaurea calcitrapa	Asteracea	Purple starthistle	Moderate	Elimination/Zero Density	4	2	2	2	2	2	2	16

Figure 1. Example priority ranking table.

Based on their Prioritization Ranking, species are assigned one of the following Prioritization Categories:

Prioritization Category	Priotization Ranking
High	16 to 23
Medium	13 to 15
Low	7 to 12
Watchlist	Not Applicable

Watchlist Species are *present in the region but not in SLO City Open Space Areas*. These species were determined by consultation with the California Invasive Plant Council, SLO County Department of Agriculture and SLO Weed Management Area to determine which species were nearby and posed a significant threat to SLO Open Space Areas. Watchlist species are targets for prevention as well as an early detection/rapid response control strategy. Watchlist species for SLO City Open Space Areas are included in Table 2.

Table 2. Watchlist species for SLO City Open Space Areas

Common Name	Species	Family	CDFA Listing	Cal-IPC Ranking	Priority
Giant reed	Arundo donax	Poaceae		High	Watch-List
Stinkwort	Dittrichea graveolens	Asteraceae		Moderate	Watch-List
Artichoke thistle	Cynara cardunculus	Asteraceae	BW	Moderate	Watch-List
Oblong spurge	Euphorbia oblongata	Euphorbiaceae	W	Limited	Watch-List
Medusahead	Elymus caput-medusae	Poaceae		High	Watch-List

Table 3. Prioritized List of Weed Species

Priority	Location	Common Name	Goal Description	Goal	Spread	Threat	Logistics	Politics	Success	Future Cost	Prioritization Ranking
HIGH	Stenner Springs Natural Reserve	Jubata grass	Eradication	5	3	3	2	3	3	3	22
	Cerro San Luis Natural Reserve	Yellow starthistle	Eradication	5	3	3	2	3	2	3	21
	Bishop Peak Natural Reserve	Yellow starthistle	Eradication	5	3	2	2	3	3	3	21
	Terrace Hill Open Space	Jubata grass	Eradication	5	3	2	3	3	3	2	21
	Irish Hills Natural Reserve	Jubata grass	Eradication	5	3	3	2	2	3	3	21
	Johnson Ranch Open Space	Jubata grass	Eradication	5	3	3	2	2	3	3	21
	Laguna Lake Natural Reserve	Saltcedar	Eradication	5	3	3	1	2	3	3	20
	Laguna Lake Natural Reserve	Jubata grass	Eradication	5	3	3	2	2	2	3	20
	Stenner Springs Natural Reserve	Yellow starthistle	Outlier Control	3	3	3	2	3	2	3	19
	Irish Hills Natural Reserve	Yellow starthistle	Outlier Control	3	3	3	2	3	2	3	19
	Irish Hills Natural Reserve	Woolly distaff thistle	Eradication	5	3	2	2	3	2	2	19
	Johnson Ranch Open Space	Woolly distaff thistle	Eradication	5	3	2	2	3	2	2	19
	Bishop Peak Natural Reserve	Woolly distaff thistle	Eradication	5	3	2	2	3	2	2	19
	Irish Hills Natural Reserve	Tree-of-heaven	Eradication	5	3	2	2	2	3	2	19
	Laguna Lake Natural Reserve	French broom	Elimination/Zero Density	4	3	3	2	2	2	3	19
	Terrace Hill Open Space	French broom	Elimination/Zero Density	4	3	3	2	2	2	3	19
	South Hills Natural Reserve	French broom	Elimination/Zero Density	4	3	3	2	2	2	3	19

Priority	Location	Common Name	Goal Description	Goal	Spread	Threat	Logistics	Politics	Success	Future Cost	Prioritization Ranking
MEDIUM	South Hills Natural Reserve	Himalayan blackberry	Elimination/Zero Density	4	3	3	2	2	2	2	18
	Irish Hills Natural Reserve	Himalayan blackberry	Elimination/Zero Density	4	3	3	2	2	2	2	18
	Johnson Ranch Open Space	Himalayan blackberry	Elimination/Zero Density	4	3	3	2	2	2	2	18
	Stenner Springs Natural Reserve	Fennel	Elimination/Zero Density	4	3	3	2	2	2	2	18
	Irish Hills Natural Reserve	Cape ivy	Elimination/Zero Density	4	3	3	2	2	2	2	18
	Bishop Peak Natural Reserve	Artichoke thistle	Eradication	5	2	2	2	3	2	2	18
	Johnson Ranch Open Space	Whitetop	Elimination/Zero Density	4	2	2	2	3	2	2	17
	Cerro San Luis Natural Reserve	French Broom	Outlier Control	3	3	3	1	2	2	3	17
	Stenner Springs Natural Reserve	Purple starthistle	Elimination/Zero Density	4	2	2	2	2	2	2	16
	Bishop Peak Natural Reserve	Purple starthistle	Elimination/Zero Density	4	2	2	2	2	2	2	16
	Cerro San Luis Natural Reserve	Purple starthistle	Elimination/Zero Density	4	2	2	2	2	2	2	16
	Laguna Lake Natural Reserve	Purple starthistle	Elimination/Zero Density	4	2	2	2	2	2	2	16
	Johnson Ranch Open Space	Onion weed	Elimination/Zero Density	4	2	2	2	2	2	2	16
	Cerro San Luis Natural Reserve	Milk thistle	Elimination/Zero Density	4	2	2	2	2	2	2	16
	Irish Hills Natural Reserve	Gazania	Eradication	5	2	1	2	2	2	2	16
	Bishop Peak Natural Reserve	Gazania	Eradication	5	2	1	2	2	2	2	16
	Reservoir Canyon Natural Reserve	French broom	Perimeter Control	2	3	2	2	2	2	3	16
	Irish Hills Natural Reserve	French broom	Perimeter Control	2	3	3	1	2	2	3	16
	Bob Jones Bike Trail	Whitetop	Elimination/Zero Density	4	2	2	1	2	2	2	15
	Reservoir Canyon Natural Reserve	Sticky snakeroot	Outlier Control	3	2	2	2	2	2	2	15
	Laguna Lake Natural Reserve	Skeleton weed	Outlier Control	3	2	2	2	3	2	1	15
	Filipponi Ecological Reserve	Milk thistle	Outlier Control	3	2	2	2	2	2	2	15
	Reservoir Canyon Natural Reserve	Milk thistle	Outlier Control	3	2	2	2	2	2	2	15
	Bob Jones Bike Trail	Milk thistle	Outlier Control	3	2	2	2	2	2	2	15
	Irish Hills Natural Reserve	Milk thistle	Outlier Control	3	2	2	2	2	2	2	15
	Johnson Ranch Open Space	Milk thistle	Outlier Control	3	2	2	2	2	2	2	15
	Laguna Lake Natural Reserve	Milk thistle	Outlier Control	3	2	2	2	2	2	2	15
	Bishop Peak Natural Reserve	Iberian knapweed	Outlier Control	3	2	2	2	2	2	2	15
	Johnson Ranch Open Space	Fuller's teasel	Elimination/Zero Density	4	2	2	2	2	2	1	15
	Reservoir Canyon Natural Reserve	Fennel	Perimeter Control	2	3	2	2	2	2	2	15
	Irish Hills Natural Reserve	Vinca	Sustained Control	1	3	2	2	2	2	2	14
	Reservoir Canyon Natural Reserve	Victorian box	Outlier Control	3	2	2	2	2	2	1	14
	South Hills Natural Reserve	Tree tobacco	Outlier Control	3	2	2	2	2	2	1	14
	Johnson Ranch Open Space	Tree tobacco	Elimination/Zero Density	4	2	1	2	2	2	1	14
	Reservoir Canyon Natural Reserve	Tasmanian bluegum	Outlier Control	3	2	2	2	1	2	2	14
	Bishop Peak Natural Reserve	Skeleton weed	Elimination/Zero Density	4	1	1	2	3	2	1	14
	Stenner Springs Natural Reserve	Short podded mustard	Outlier Control	3	3	2	1	2	1	2	14
	Bishop Peak Natural Reserve	Short podded mustard	Outlier Control	3	2	2	2	2	2	1	14
	Johnson Ranch Open Space	Short podded mustard	Perimeter Control	2	2	2	2	2	2	2	14
	Bob Jones Bike Trail	Purple starthistle	Outlier Control	3	2	2	2	2	2	1	14
	Cerro San Luis Natural Reserve	Iceplant	Perimeter Control	2	2	2	2	2	2	2	14
	Terrace Hill Open Space	Fountaingrass	Perimeter Control	2	2	2	2	2	2	2	14
	Bishop Peak Natural Reserve	Fennel	Sustained Control	1	3	2	2	2	2	2	14
	Terrace Hill Open Space	Fennel	Sustained Control	1	3	2	2	2	2	2	14
	South Hills Natural Reserve	Fennel	Sustained Control	1	2	3	2	2	2	2	14
	Laguna Lake Natural Reserve	Fennel	Sustained Control	1	2	3	2	2	2	2	14
	Bob Jones Bike Trail	Fennel	Sustained Control	1	3	2	2	2	2	2	14
	Johnson Ranch Open Space	Fennel	Sustained Control	1	3	2	2	2	2	2	14
	Bob Jones Bike Trail	Elmleaf bramble	Sustained Control	1	3	3	1	2	1	3	14
	Bob Jones Bike Trail	Cape ivy	Sustained Control	1	3	3	1	2	1	3	14
	Cerro San Luis Natural Reserve	Bull thistle	Outlier Control	3	2	2	2	2	2	1	14
	Stenner Springs Natural Reserve	Milk thistle	Elimination/Zero Density	4	2	1	2	2	2	1	14
	Bob Jones Bike Trail	Bird's rape mustard	Perimeter Control	2	2	2	2	2	2	2	14

Priority	Location	Common Name	Goal Description	Goal	Spread	Threat	Logistics	Politics	Success	Future Cost	Prioritization Ranking
LOW	Cerro San Luis Natural Reserve	Woolly cotoneaster	Perimeter Control	2	2	2	2	2	2	1	13
	Filipponi Ecological Reserve	Whitetop	Perimeter Control	2	2	2	1	2	2	2	13
	Reservoir Canyon Natural Reserve	White horehound	Outlier Control	3	2	1	2	2	2	1	13
	Johnson Ranch Open Space	White horehound	Outlier Control	3	2	1	2	2	2	1	13
	Stenner Springs Natural Reserve	Tasmanian bluegum	Perimeter control	2	2	2	2	1	2	2	13
	Irish Hills Natural Reserve	Sweet pea	Elimination/Zero Density	4	2	1	2	1	2	1	13
	Reservoir Canyon Natural Reserve	Short podded mustard	Outlier Control	3	2	2	1	2	1	2	13
	Laguna Lake Natural Reserve	Short podded mustard	Outlier Control	3	2	2	1	2	1	2	13
	Cerro San Luis Natural Reserve	Short podded mustard	Outlier Control	3	2	2	2	2	1	1	13
	Stenner Springs Natural Reserve	Poison hemlock	Sustained Control	1	2	2	2	2	2	2	13
	South Hills Natural Reserve	Peruvian pepper tree	Perimeter Control	2	2	2	2	1	2	2	13
	Cerro San Luis Natural Reserve	Peruvian pepper tree	Perimeter Control	2	2	2	2	1	2	2	13
	Reservoir Canyon Natural Reserve	Panic veldtgrass	Outlier Control	3	2	2	1	2	1	2	13
	Bishop Peak Natural Reserve	Mediterranean linseed	Outlier Control	3	2	1	2	2	1	2	13
	Cerro San Luis Natural Reserve	Fountaingrass	Perimeter Control	2	2	2	2	2	1	2	13
	Cerro San Luis Natural Reserve	Fennel	Sustained Control	1	2	2	2	2	2	2	13
	Filipponi Ecological Reserve	Fennel	Sustained Control	1	2	2	2	2	2	2	13
	Bob Jones Bike Trail	Canary Island date palm	Elimination/Zero Density	4	1	2	2	1	2	1	13
	Irish Hills Natural Reserve	Canary Island date palm	Elimination/Zero Density	4	2	1	2	1	2	1	13
	Laguna Lake Natural Reserve	Bullthistle	Outlier Control	3	2	2	2	2	1	1	13
	South Hills Natural Reserve	Tasmanian bluegum	Perimeter Control	2	2	2	2	1	2	2	13
	Laguna Lake Natural Reserve	Tasmanian bluegum	Perimeter Control	2	2	2	2	1	2	2	13
	Stenner Springs Natural Reserve	Black mustard	Perimeter control	2	2	2	2	2	2	1	13
	Bishop Peak Natural Reserve	Black mustard	Perimeter Control	2	2	2	2	2	2	1	13
	South Hills Natural Reserve	African asparagus fern	Outlier Control	3	2	2	1	2	1	2	13
	Bob Jones Bike Trail	White horehound	Outlier Control	3	1	1	2	2	2	1	12
	Bob Jones Bike Trail	Vinca	Perimeter Control	2	2	2	1	2	1	2	12
	Stenner Springs Natural Reserve	Tocalote	Sustained Control	1	3	2	1	2	1	2	12

Priority	Location	Common Name	Goal Description	Goal	Spread	Threat	Logistics	Politics	Success	Future Cost	Prioritization Ranking
LOW	Johnson Ranch Open Space	Tocalote	Sustained Control	1	3	2	1	2	1	2	12
	Reservoir Canyon Natural Reserve	Tocalote	Sustained Control	1	3	2	1	2	1	2	12
	Cerro San Luis Natural Reserve	Tocalote	Sustained Control	1	3	2	1	2	1	2	12
	Filipponi Ecological Reserve	Tocalote	Sustained Control	1	3	2	1	2	1	2	12
	Laguna Lake Natural Reserve	Tocalote	Sustained Control	1	3	2	1	2	1	2	12
	Irish Hills Natural Reserve	Tocalote	Sustained Control	1	3	2	1	2	1	2	12
	Bishop Peak Natural Reserve	Tocalote	Sustained Control	1	3	2	1	2	1	2	12
	South Hills Natural Reserve	Sourgrass	Sustained Control	1	2	2	2	2	2	1	12
	Terrace Hill Open Space	Skeleton weed	Sustained Control	1	2	2	2	3	1	1	12
	Laguna Lake Natural Reserve	Petty spurge	Sustained Control	1	3	2	1	2	1	2	12
	Filipponi Ecological Reserve	Peruvian pepper tree	Perimeter Control	2	1	2	2	1	2	2	12
	Irish Hills Natural Reserve	Opium poppy	Outlier Control	3	2	1	1	2	2	1	12
	Irish Hills Natural Reserve	Kikuyugrass	Outlier Control	3	2	1	1	2	2	1	12
	Laguna Lake Natural Reserve	Indian teasel	Perimeter Control	2	2	2	2	2	1	1	12
	Cerro San Luis Natural Reserve	Fuller's teasel	Sustained Control	1	2	2	2	2	2	1	12
	Laguna Lake Natural Reserve	Fountaingrass	Perimeter Control	2	2	2	2	2	1	1	12
	Bishop Peak Natural Reserve	Common wheat	Outlier Control	3	1	1	2	2	2	1	12
	Bishop Peak Natural Reserve	Bermuda grass	Perimeter Control	2	2	2	2	1	2	1	12
	Terrace Hill Open Space	Short podded mustard	Sustained Control	1	2	2	2	2	1	1	11
	Filipponi Ecological Reserve	Short podded mustard	Sustained Control	1	2	2	2	2	1	1	11
	Reservoir Canyon Natural Reserve	Rose clover	Sustained Control	1	2	2	2	2	1	1	11
	Stenner Springs Natural Reserve	Red brome	Sustained Control	1	3	3	1	1	1	1	11
	Bob Jones Bike Trail	Red brome	Sustained Control	1	3	2	1	1	1	2	11
	Johnson Ranch Open Space	Red brome	Sustained Control	1	3	2	1	1	1	2	11
	Reservoir Canyon Natural Reserve	Poison hemlock	Sustained Control	1	2	2	1	2	1	2	11
	Laguna Lake Natural Reserve	Poison hemlock	Sustained Control	1	2	2	1	2	1	2	11
	Irish Hills Natural Reserve	Poison hemlock	Sustained Control	1	2	2	1	2	1	2	11
	Filipponi Ecological Reserve	Poison hemlock	Sustained Control	1	2	2	1	2	1	2	11
	South Hills Natural Reserve	Petty spurge	Sustained Control	1	2	2	1	2	1	2	11
	Laguna Lake Natural Reserve	Naked lady	Outlier Control	3	1	1	2	2	1	1	11
	Laguna Lake Natural Reserve	Mediterranean linseed	Outlier Control	3	2	1	1	2	1	1	11
	Reservoir Canyon Natural Reserve	Italian rye grass	Sustained Control	1	3	2	1	1	1	2	11
	Filipponi Ecological Reserve	Fuller's teasel	Sustained Control	1	2	2	1	2	1	2	11

Priority	Location	Common Name	Goal Description	Goal	Spread	Threat	Logistics	Politics	Success	Future Cost	Prioritization Ranking
LOW	Johnson Ranch Open Space	Dwarf nettle	Sustained Control	1	2	1	2	2	2	1	11
	Bishop Peak Natural Reserve	Dallis grass	Outlier Control	3	2	1	1	2	1	1	11
	Bishop Peak Natural Reserve	Common velvetgrass	Perimeter Control	2	2	2	1	1	1	2	11
	Bishop Peak Natural Reserve	Coastal heron's bill	Sustained Control	1	2	2	1	2	1	2	11
	Bob Jones Bike Trail	Castor bean	Sustained Control	1	2	1	2	2	2	1	11
	Terrace Hill Open Space	Black mustard	Sustained Control	1	2	2	2	2	1	1	11
	Cerro San Luis Natural Reserve	Black mustard	Sustained Control	1	2	2	2	2	1	1	11
	Laguna Lake Natural Reserve	Black mustard	Sustained Control	1	2	2	2	2	1	1	11
	Bob Jones Bike Trail	Black mustard	Sustained Control	1	2	2	2	2	1	1	11
	Johnson Ranch Open Space	Black mustard	Sustained Control	1	2	2	2	2	1	1	11
	Filipponi Ecological Reserve	Black mustard	Sustained Control	1	2	2	1	2	1	2	11
	Filipponi Ecological Reserve	Bird's rape mustard	Perimeter Control	2	2	2	1	2	1	1	11
	South Hills Natural Reserve	Spiny sowthistle	Sustained Control	1	2	1	2	2	1	1	10
	Reservoir Canyon Natural Reserve	Sourgrass	Sustained Control	1	2	1	1	2	1	2	10
	Terrace Hill Open Space	Sourgrass	Sustained Control	1	2	2	1	2	1	1	10
	Cerro San Luis Natural Reserve	Sourgrass	Sustained Control	1	2	2	1	2	1	1	10
	Irish Hills Natural Reserve	Sorghum	Sustained Control	1	2	1	2	2	1	1	10
	Laguna Lake Natural Reserve	Silver dollar gum	Perimeter Control	2	1	1	2	1	2	1	10
	Bob Jones Bike Trail	Short podded mustard	Sustained Control	1	2	2	1	2	1	1	10
	Bishop Peak Natural Reserve	Ripgut brome	Sustained Control	1	2	2	1	1	1	2	10
	Bishop Peak Natural Reserve	Red brome	Sustained Control	1	2	2	1	1	1	2	10
	Reservoir Canyon Natural Reserve	Red brome	Sustained Control	1	2	2	1	1	1	2	10
	South Hills Natural Reserve	Red brome	Sustained Control	1	2	2	1	1	1	2	10
	Cerro San Luis Natural Reserve	Red brome	Sustained Control	1	2	2	1	1	1	2	10
	Laguna Lake Natural Reserve	Red brome	Sustained Control	1	2	2	1	1	1	2	10
	South Hills Natural Reserve	Prostrate knotweed	Sustained Control	1	2	1	2	2	1	1	10
	Bob Jones Bike Trail	Poison hemlock	Sustained Control	1	2	2	1	2	1	1	10
	Bob Jones Bike Trail	Petty spurge	Sustained Control	1	2	2	1	2	1	1	10
	Filipponi Ecological Reserve	Petty spurge	Sustained Control	1	2	2	1	2	1	1	10
	Bob Jones Bike Trail	Peruvian pepper tree	Perimeter Control	2	1	1	2	1	2	1	10
	Laguna Lake Natural Reserve	Manna gum	Perimeter Control	2	1	1	2	1	2	1	10
	Bishop Peak Natural Reserve	Italian thistle	Sustained Control	1	2	2	1	2	1	1	10
	Johnson Ranch Open Space	Italian thistle	Sustained Control	1	2	2	1	2	1	1	10

Priority	Location	Common Name	Goal Description	Goal	Spread	Threat	Logistics	Politics	Success	Future Cost	Prioritization Ranking
LOW	Stenner Springs Natural Reserve	Italian thistle	Sustained Control	1	2	2	1	2	1	1	10
	Reservoir Canyon Natural Reserve	Italian thistle	Sustained Control	1	2	2	1	2	1	1	10
	Cerro San Luis Natural Reserve	Italian thistle	Sustained Control	1	2	2	1	2	1	1	10
	Bob Jones Bike Trail	Italian thistle	Sustained Control	1	2	2	1	2	1	1	10
	Irish Hills Natural Reserve	Italian thistle	Sustained Control	1	2	2	1	2	1	1	10
	Filipponi Ecological Reserve	Italian thistle	Sustained Control	1	2	2	1	2	1	1	10
	Bishop Peak Natural Reserve	Italian rye grass	Sustained Control	1	2	2	1	1	1	2	10
	South Hills Natural Reserve	Italian rye grass	Sustained Control	1	2	2	1	1	1	2	10
	Cerro San Luis Natural Reserve	Italian rye grass	Sustained Control	1	2	2	1	1	1	2	10
	Laguna Lake Natural Reserve	Italian rye grass	Sustained Control	1	2	2	1	1	1	2	10
	Laguna Lake Natural Reserve	Harding grass	Sustained Control	1	2	2	1	2	1	1	10
	Terrace Hill Open Space	English plantain	Sustained Control	1	2	1	2	2	1	1	10
	Terrace Hill Open Space	Common wheat	Sustained Control	1	1	1	2	2	2	1	10
	Bob Jones Bike Trail	Common sowthistle	Sustained Control	1	2	2	1	2	1	1	10
	South Hills Natural Reserve	Common sowthistle	Sustained Control	1	2	1	2	2	1	1	10
	Laguna Lake Natural Reserve	Bladderflower	Perimeter Control	2	2	1	1	2	1	1	10
	Reservoir Canyon Natural Reserve	Black mustard	Sustained Control	1	2	2	1	2	1	1	10
	Reservoir Canyon Natural Reserve	Bermuda grass	Perimeter Control	2	1	2	1	1	1	2	10
	Bishop Peak Natural Reserve	Wild oat	Sustained Control	1	2	2	1	1	1	1	9
	Terrace Hill Open Space	Wild oat	Sustained Control	1	2	2	1	1	1	1	9
	Reservoir Canyon Natural Reserve	Wild oat	Sustained Control	1	2	2	1	1	1	1	9
	South Hills Natural Reserve	Wild oat	Sustained Control	1	2	2	1	1	1	1	9
	Cerro San Luis Natural Reserve	Wild oat	Sustained Control	1	2	2	1	1	1	1	9
	Laguna Lake Natural Reserve	Wild oat	Sustained Control	1	2	2	1	1	1	1	9
	Bob Jones Bike Trail	Wild oat	Sustained Control	1	2	2	1	1	1	1	9
	Irish Hills Natural Reserve	Wild oat	Sustained Control	1	2	2	1	1	1	1	9
	Johnson Ranch Open Space	Wild oat	Sustained Control	1	2	2	1	1	1	1	9
	Filipponi Ecological Reserve	Wild oat	Sustained Control	1	2	2	1	1	1	1	9
	Bob Jones Bike Trail	Wild radish	Sustained Control	1	2	1	1	2	1	1	9
	Laguna Lake Natural Reserve	Wild radish	Sustained Control	1	2	1	1	2	1	1	9

Priority	Location	Common Name	Goal Description	Goal	Spread	Threat	Logistics	Politics	Success	Future Cost	Prioritization Ranking
LOW	Filipponi Ecological Reserve	Wild radish	Sustained Control	1	2	1	1	2	1	1	9
	Reservoir Canyon Natural Reserve	Wild parsley	Sustained Control	1	2	1	1	2	1	1	9
	Reservoir Canyon Natural Reserve	Wild geranium	Sustained Control	1	2	1	1	2	1	1	9
	Laguna Lake Natural Reserve	Whitestern filaree	Sustained Control	1	2	1	1	2	1	1	9
	Bob Jones Bike Trail	Whitestern filaree	Sustained Control	1	2	1	1	2	1	1	9
	Irish Hills Natural Reserve	Whitestern filaree	Sustained Control	1	2	1	1	2	1	1	9
	Filipponi Ecological Reserve	Whitestern filaree	Sustained Control	1	2	1	1	2	1	1	9
	Reservoir Canyon Natural Reserve	Whitestem filaree	Sustained Control	1	2	1	1	2	1	1	9
	Terrace Hill Open Space	Whitestem filaree	Sustained Control	1	2	1	1	2	1	1	9
	Irish Hills Natural Reserve	Water mint	Sustained Control	1	2	1	1	2	1	1	9
	Bob Jones Bike Trail	Spiny sowthistle	Sustained Control	1	2	1	1	2	1	1	9
	Reservoir Canyon Natural Reserve	Spiny sowthistle	Sustained Control	1	2	1	1	2	1	1	9
	Johnson Ranch Open Space	Spiny sowthistle	Sustained Control	1	2	1	1	2	1	1	9
	Cerro San Luis Natural Reserve	Spiny sowthistle	Sustained Control	1	2	1	1	2	1	1	9
	Laguna Lake Natural Reserve	Spiny sowthistle	Sustained Control	1	2	1	1	2	1	1	9
	Filipponi Ecological Reserve	Spiny sowthistle	Sustained Control	1	2	1	1	2	1	1	9
	Irish Hills Natural Reserve	Sourgrass	Sustained Control	1	2	1	1	2	1	1	9
	Johnson Ranch Open Space	Sourgrass	Sustained Control	1	2	1	1	2	1	1	9
	Reservoir Canyon Natural Reserve	Smooth cat's ear	Sustained Control	1	2	1	1	2	1	1	9
	Laguna Lake Natural Reserve	Smooth cat's ear	Sustained Control	1	2	1	1	2	1	1	9
	Bob Jones Bike Trail	Smilo grass	Sustained Control	1	2	1	1	2	1	1	9
	Irish Hills Natural Reserve	Small bur clover	Sustained Control	1	2	1	1	2	1	1	9
	Bishop Peak Natural Reserve	Slim oat	Sustained Control	1	2	2	1	1	1	1	9
	Terrace Hill Open Space	Slim oat	Sustained Control	1	2	2	1	1	1	1	9
	South Hills Natural Reserve	Slim oat	Sustained Control	1	2	2	1	1	1	1	9
	Reservoir Canyon Natural Reserve	Slim oat	Sustained Control	1	2	2	1	1	1	1	9
	Cerro San Luis Natural Reserve	Slim oat	Sustained Control	1	2	2	1	1	1	1	9
	Laguna Lake Natural Reserve	Slim oat	Sustained Control	1	2	2	1	1	1	1	9
	Bob Jones Bike Trail	Slim oat	Sustained Control	1	2	2	1	1	1	1	9
	Irish Hills Natural Reserve	Slim oat	Sustained Control	1	2	2	1	1	1	1	9
	Reservoir Canyon Natural Reserve	Scarlet pimpernel	Sustained Control	1	2	1	1	2	1	1	9
	Reservoir Canyon Natural Reserve	Ripgut brome	Sustained Control	1	2	2	1	1	1	1	9

Priority	Location	Common Name	Goal Description	Goal	Spread	Threat	Logistics	Politics	Success	Future Cost	Prioritization Ranking
LOW	Terrace Hill Open Space	Ripgut brome	Sustained Control	1	2	2	1	1	1	1	9
	South Hills Natural Reserve	Ripgut brome	Sustained Control	1	2	2	1	1	1	1	9
	Cerro San Luis Natural Reserve	Ripgut brome	Sustained Control	1	2	2	1	1	1	1	9
	Laguna Lake Natural Reserve	Ripgut brome	Sustained Control	1	2	2	1	1	1	1	9
	Bob Jones Bike Trail	Ripgut brome	Sustained Control	1	2	2	1	1	1	1	9
	Johnson Ranch Open Space	Ripgut brome	Sustained Control	1	2	2	1	1	1	1	9
	Filipponi Ecological Reserve	Ripgut brome	Sustained Control	1	2	2	1	1	1	1	9
	Stenner Springs Natural Reserve	Ribwort	Sustained Control	1	2	1	1	2	1	1	9
	Irish Hills Natural Reserve	Rattlesnake grass	Sustained Control	1	2	1	1	2	1	1	9
	Terrace Hill Open Space	Rattail sixweeks grass	Sustained Control	1	2	2	1	1	1	1	9
	Bishop Peak Natural Reserve	Spiny sowthistle	Sustained Control	1	2	1	1	2	1	1	9
	Stenner Springs Natural Reserve	Spiny sowthistle	Sustained Control	1	2	1	1	2	1	1	9
	Terrace Hill Open Space	Prickly lettuce	Sustained Control	1	2	1	1	2	1	1	9
	Johnson Ranch Open Space	Prickly lettuce	Sustained Control	1	2	1	1	2	1	1	9
	Bob Jones Bike Trail	Prickly lettuce	Sustained Control	1	2	1	1	2	1	1	9
	Filipponi Ecological Reserve	Prickly lettuce	Sustained Control	1	2	1	1	2	1	1	9
	Bishop Peak Natural Reserve	Pineapple weed	Sustained Control	1	2	1	1	2	1	1	9
	South Hills Natural Reserve	Pineapple weed	Sustained Control	1	2	1	1	2	1	1	9
	Johnson Ranch Open Space	Pineapple weed	Sustained Control	1	2	1	1	2	1	1	9
	Reservoir Canyon Natural Reserve	Pineapple weed	Sustained Control	1	2	1	1	2	1	1	9
	Laguna Lake Natural Reserve	Pineapple weed	Sustained Control	1	2	1	1	2	1	1	9
	Reservoir Canyon Natural Reserve	Petty spurge	Sustained Control	1	2	1	1	2	1	1	9
	Bishop Peak Natural Reserve	Nettle leaf goosefoot	Sustained Control	1	1	1	2	2	1	1	9
	Reservoir Canyon Natural Reserve	Jointed charlock	Sustained Control	1	2	1	1	2	1	1	9
	Terrace Hill Open Space	Italian rye grass	Sustained Control	1	2	2	1	1	1	1	9
	Johnson Ranch Open Space	Italian rye grass	Sustained Control	1	2	2	1	1	1	1	9
	Laguna Lake Natural Reserve	Hairy cat's ear	Sustained Control	1	2	1	1	2	1	1	9
	Bob Jones Bike Trail	Hairy cat's ear	Sustained Control	1	2	1	1	2	1	1	9
	Reservoir Canyon Natural Reserve	Garden nasturtium	Sustained Control	1	2	1	1	2	1	1	9
	Bob Jones Bike Trail	Garden nasturtium	Sustained Control	1	1	2	1	2	1	1	9

Priority	Location	Common Name	Goal Description	Goal	Spread	Threat	Logistics	Politics	Success	Future Cost	Prioritization Ranking
LOW	Bishop Peak Natural Reserve	Foxtail barley	Sustained Control	1	2	2	1	1	1	1	9
	Irish Hills Natural Reserve	Flax-leaved horseweed	Sustained Control	1	2	1	1	2	1	1	9
	Bishop Peak Natural Reserve	English plantain	Sustained Control	1	2	1	1	2	1	1	9
	Reservoir Canyon Natural Reserve	English plantain	Sustained Control	1	2	1	1	2	1	1	9
	Bishop Peak Natural Reserve	Curly dock	Sustained Control	1	2	1	1	2	1	1	9
	Reservoir Canyon Natural Reserve	Curly dock	Sustained Control	1	2	1	1	2	1	1	9
	Laguna Lake Natural Reserve	Curly dock	Sustained Control	1	2	1	1	2	1	1	9
	Johnson Ranch Open Space	Curly dock	Sustained Control	1	2	1	1	2	1	1	9
	Laguna Lake Natural Reserve	Common wheat	Sustained Control	1	1	1	2	2	1	1	9
	Johnson Ranch Open Space	Common sowthistle	Sustained Control	1	2	1	1	2	1	1	9
	Reservoir Canyon Natural Reserve	Common sowthistle	Sustained Control	1	2	1	1	2	1	1	9
	Bishop Peak Natural Reserve	Common mallow	Sustained Control	1	2	1	1	2	1	1	9
	Terrace Hill Open Space	Common mallow	Sustained Control	1	2	1	1	2	1	1	9
	Laguna Lake Natural Reserve	Common mallow	Sustained Control	1	2	1	1	2	1	1	9
	Johnson Ranch Open Space	Common mallow	Sustained Control	1	2	1	1	2	1	1	9
	Filipponi Ecological Reserve	Common mallow	Sustained Control	1	2	1	1	2	1	1	9
	Stenner Springs Natural Reserve	Coastal heron's bill	Sustained Control	1	2	1	1	2	1	1	9
	Reservoir Canyon Natural Reserve	Coastal heron's bill	Sustained Control	1	2	1	1	2	1	1	9
	Terrace Hill Open Space	Coastal heron's bill	Sustained Control	1	2	1	1	2	1	1	9
	South Hills Natural Reserve	Coastal heron's bill	Sustained Control	1	2	1	1	2	1	1	9
	Laguna Lake Natural Reserve	Coastal heron's bill	Sustained Control	1	2	1	1	2	1	1	9
	Bob Jones Bike Trail	Coastal heron's bill	Sustained Control	1	2	1	1	2	1	1	9
	Irish Hills Natural Reserve	Coastal heron's bill	Sustained Control	1	2	1	1	2	1	1	9
	Johnson Ranch Open Space	Coastal heron's bill	Sustained Control	1	2	1	1	2	1	1	9
	Filipponi Ecological Reserve	Coastal heron's bill	Sustained Control	1	2	1	1	2	1	1	9
	Bishop Peak Natural Reserve	California burclover	Sustained Control	1	2	1	1	2	1	1	9
	Reservoir Canyon Natural Reserve	California burclover	Sustained Control	1	2	1	1	2	1	1	9
	Terrace Hill Open Space	California burclover	Sustained Control	1	2	1	1	2	1	1	9
	Johnson Ranch Open Space	California burclover	Sustained Control	1	2	1	1	2	1	1	9

Priority	Location	Common Name	Goal Description	Goal	Spread	Threat	Logistics	Politics	Success	Future Cost	Prioritization Ranking
LOW	Bishop Peak Natural Reserve	Bull mallow	Sustained Control	1	2	1	1	2	1	1	9
	Laguna Lake Natural Reserve	Bristly ox-tongue	Sustained Control	1	2	1	1	2	1	1	9
	Bob Jones Bike Trail	Bristly ox-tongue	Sustained Control	1	2	1	1	2	1	1	9
	Johnson Ranch Open Space	Bristly ox-tongue	Sustained Control	1	2	1	1	2	1	1	9
	Bishop Peak Natural Reserve	Big heron bill	Sustained Control	1	2	1	1	2	1	1	9
	Reservoir Canyon Natural Reserve	Big heron bill	Sustained Control	1	2	1	1	2	1	1	9
	Terrace Hill Open Space	Big heron bill	Sustained Control	1	2	1	1	2	1	1	9
	Johnson Ranch Open Space	Big heron bill	Sustained Control	1	2	1	1	2	1	1	9
	Reservoir Canyon Natural Reserve	Annual yellow sweetclover	Sustained Control	1	2	1	1	2	1	1	9
	Johnson Ranch Open Space	Annual yellow sweetclover	Sustained Control	1	2	1	1	2	1	1	9
	Reservoir Canyon Natural Reserve	Almond	Sustained Control	1	1	1	2	1	2	1	9
	Reservoir Canyon Natural Reserve	Willow lettuce	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Willow lettuce	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Wild geranium	Sustained Control	1	1	1	1	2	1	1	8
	Filipponi Ecological Reserve	Wild geranium	Sustained Control	1	1	1	1	2	1	1	8
	Bob Jones Bike Trail	White ramping fumitory	Sustained Control	1	1	1	1	2	1	1	8
	Filipponi Ecological Reserve	White ramping fumitory	Sustained Control	1	1	1	1	2	1	1	8
	Cerro San Luis Natural Reserve	White horehound	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Water speedwell	Sustained Control	1	1	1	1	2	1	1	8
	Bishop Peak Natural Reserve	Villous sand spurry	Sustained Control	1	1	1	1	2	1	1	8
	Cerro San Luis Natural Reserve	Upright praire coneflower	Sustained Control	1	1	1	1	2	1	1	8
	Stenner Springs Natural Reserve	Spring vetch	Sustained Control	1	1	1	1	2	1	1	8
	Bishop Peak Natural Reserve	South American soliva	Sustained Control	1	1	1	1	2	1	1	8
	Reservoir Canyon Natural Reserve	Soft chess	Sustained Control	1	2	1	1	1	1	1	8
	Laguna Lake Natural Reserve	Soft chess	Sustained Control	1	2	1	1	1	1	1	8
	Johnson Ranch Open Space	Soft chess	Sustained Control	1	2	1	1	1	1	1	8
	Reservoir Canyon Natural Reserve	Smooth vetch	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Smooth vetch	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Smooth crabgrass	Sustained Control	1	2	1	1	1	1	1	8
	Stenner Springs Natural Reserve	Slim oat	Sustained Control	1	1	2	1	1	1	1	8
	Laguna Lake Natural Reserve	Shepherd's needle	Sustained Control	1	1	1	1	2	1	1	8

Priority	Location	Common Name	Goal Description	Goal	Spread	Threat	Logistics	Politics	Success	Future Cost	Prioritization Ranking
LOW	Laguna Lake Natural Reserve	Sheep sorrel	Sustained Control	1	1	1	1	2	1	1	8
	Bishop Peak Natural Reserve	Scarlet pimpernel	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Scarlet pimpernel	Sustained Control	1	1	1	1	2	1	1	8
	Filipponi Ecological Reserve	Scarlet pimpernel	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Salsify	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Rosy ice plant	Sustained Control	1	1	1	1	2	1	1	8
	Bishop Peak Natural Reserve	Rose clover	Sustained Control	1	1	1	1	2	1	1	8
	Stenner Springs Natural Reserve	Ripgut brome	Sustained Control	1	1	2	1	1	1	1	8
	Laguna Lake Natural Reserve	Ribwort	Sustained Control	1	1	1	1	2	1	1	8
	Filipponi Ecological Reserve	Red brome	Sustained Control	1	2	1	1	1	1	1	8
	Bishop Peak Natural Reserve	Rattail sixweeks grass	Sustained Control	1	2	1	1	1	1	1	8
	Reservoir Canyon Natural Reserve	Rattail sixweeks grass	Sustained Control	1	2	1	1	1	1	1	8
	Laguna Lake Natural Reserve	Purple vetch	Sustained Control	1	1	1	1	2	1	1	8
	Bishop Peak Natural Reserve	Purple sand spurry	Sustained Control	1	1	1	1	2	1	1	8
	Reservoir Canyon Natural Reserve	Purple false brome	Sustained Control	1	1	2	1	1	1	1	8
	Cerro San Luis Natural Reserve	Purple dead nettle	Sustained Control	1	1	1	1	2	1	1	8
	Reservoir Canyon Natural Reserve	Prostrate knotweed	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Prostrate knotweed	Sustained Control	1	1	1	1	2	1	1	8
	Johnson Ranch Open Space	Nettle leaf goose foot	Sustained Control	1	1	1	1	2	1	1	8
	Reservoir Canyon Natural Reserve	Narrowleaf cottonrose	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Mexican tea	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Mexican oxalis	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Mayten	Sustained Control	1	1	1	1	2	1	1	8
	Reservoir Canyon Natural Reserve	Jersey cudweed	Sustained Control	1	1	1	1	2	1	1	8
	Bob Jones Bike Trail	Jersey cudweed	Sustained Control	1	1	1	1	2	1	1	8
	Stenner Springs Natural Reserve	Italian rye grass	Sustained Control	1	1	2	1	1	1	1	8
	Filipponi Ecological Reserve	Italian rye grass	Sustained Control	1	1	2	1	1	1	1	8
	Laguna Lake Natural Reserve	Hyssop loosestrife	Sustained Control	1	1	1	1	2	1	1	8
	Reservoir Canyon Natural Reserve	Hood canarygrass	Sustained Control	1	1	1	1	2	1	1	8

Priority	Location	Common Name	Goal Description	Goal	Spread	Threat	Logistics	Politics	Success	Future Cost	Prioritization Ranking
LOW	Laguna Lake Natural Reserve	Henbit	Sustained Control	1	1	1	1	2	1	1	8
	Reservoir Canyon Natural Reserve	Hedge mustard	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Hairy vetch	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Hairy vetch	Sustained Control	1	1	1	1	2	1	1	8
	Irish Hills Natural Reserve	Goldentop	Sustained Control	1	2	1	1	1	1	1	8
	Terrace Hill Open Space	Foxtail barley	Sustained Control	1	2	1	1	1	1	1	8
	Cerro San Luis Natural Reserve	Foxtail barley	Sustained Control	1	2	1	1	1	1	1	8
	Johnson Ranch Open Space	Foxtail barley	Sustained Control	1	2	1	1	1	1	1	8
	Reservoir Canyon Natural Reserve	Flax-leaved horseweed	Sustained Control	1	1	1	1	2	1	1	8
	Bob Jones Bike Trail	Flax-leaved horseweed	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Firethorn	Sustained Control	1	1	1	1	2	1	1	8
	Bishop Peak Natural Reserve	Field madder	Sustained Control	1	1	1	1	2	1	1	8
	Cerro San Luis Natural Reserve	Feathertop	Sustained Control	1	1	1	1	2	1	1	8
	South Hills Natural Reserve	English plantain	Sustained Control	1	1	1	1	2	1	1	8
	Cerro San Luis Natural Reserve	English plantain	Sustained Control	1	1	1	1	2	1	1	8
	Bob Jones Bike Trail	English plantain	Sustained Control	1	1	1	1	2	1	1	8
	Irish Hills Natural Reserve	English plantain	Sustained Control	1	1	1	1	2	1	1	8
	Bishop Peak Natural Reserve	Dog fennel	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Dog fennel	Sustained Control	1	1	1	1	2	1	1	8
	Reservoir Canyon Natural Reserve	Ditch beard grass	Sustained Control	1	2	1	1	1	1	1	8
	Terrace Hill Open Space	Dandelion	Sustained Control	1	1	1	1	2	1	1	8
	Bob Jones Bike Trail	Dandelion	Sustained Control	1	1	1	1	2	1	1	8
	South Hills Natural Reserve	Curly dock	Sustained Control	1	1	1	1	2	1	1	8
	Cerro San Luis Natural Reserve	Curly dock	Sustained Control	1	1	1	1	2	1	1	8
	Bob Jones Bike Trail	Curly dock	Sustained Control	1	1	1	1	2	1	1	8
	Filipponi Ecological Reserve	Curly dock	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Crete weed	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Cretan mallow	Sustained Control	1	1	1	1	2	1	1	8
	Reservoir Canyon Natural Reserve	Common vetch	Sustained Control	1	1	1	1	2	1	1	8

Priority	Location	Common Name	Goal Description	Goal	Spread	Threat	Logistics	Politics	Success	Future Cost	Prioritization Ranking
LOW	Laguna Lake Natural Reserve	Common sowthistle	Sustained Control	1	1	1	1	2	1	1	8
	Bishop Peak Natural Reserve	Common sowthistle	Sustained Control	1	1	1	1	2	1	1	8
	Filipponi Ecological Reserve	Common sowthistle	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Common plantain	Sustained Control	1	1	1	1	2	1	1	8
	Bishop Peak Natural Reserve	Common groundsel	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Common catchfly	Sustained Control	1	1	1	1	2	1	1	8
	Cerro San Luis Natural Reserve	Coastal heron's bill	Sustained Control	1	1	1	1	2	1	1	8
	Bishop Peak Natural Reserve	Chickweed	Sustained Control	1	1	1	1	2	1	1	8
	Reservoir Canyon Natural Reserve	Chickweed	Sustained Control	1	1	1	1	2	1	1	8
	Reservoir Canyon Natural Reserve	Cheeseweed	Sustained Control	1	1	1	1	2	1	1	8
	Bishop Peak Natural Reserve	Charlock	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Carrot	Sustained Control	1	1	1	1	2	1	1	8
	South Hills Natural Reserve	California burclover	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	California burclover	Sustained Control	1	1	1	1	2	1	1	8
	Filipponi Ecological Reserve	California burclover	Sustained Control	1	1	1	1	2	1	1	8
	Irish Hills Natural Reserve	California bur clover	Sustained Control	1	1	1	1	2	1	1	8
	Reservoir Canyon Natural Reserve	Bull mallow	Sustained Control	1	1	1	1	2	1	1	8
	Bob Jones Bike Trail	Bull mallow	Sustained Control	1	1	1	1	2	1	1	8
	Cerro San Luis Natural Reserve	Bristly oxtongue	Sustained Control	1	1	1	1	2	1	1	8
	Filipponi Ecological Reserve	Bristly oxtongue	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Bird's foot trefoil	Sustained Control	1	1	1	1	2	1	1	8
	Cerro San Luis Natural Reserve	Big heron bill	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Big heron bill	Sustained Control	1	1	1	1	2	1	1	8
	Stenner Springs Natural Reserve	Annual yellow sweetclover	Sustained Control	1	1	1	1	2	1	1	8
	Laguna Lake Natural Reserve	Annual yellow sweetclover	Sustained Control	1	1	1	1	2	1	1	8
	Bob Jones Bike Trail	Annual yellow sweetclover	Sustained Control	1	1	1	1	2	1	1	8
	Filipponi Ecological Reserve	Annual yellow sweetclover	Sustained Control	1	1	1	1	2	1	1	8
	Reservoir Canyon Natural Reserve	Annual blue grass	Sustained Control	1	2	1	1	1	1	1	8

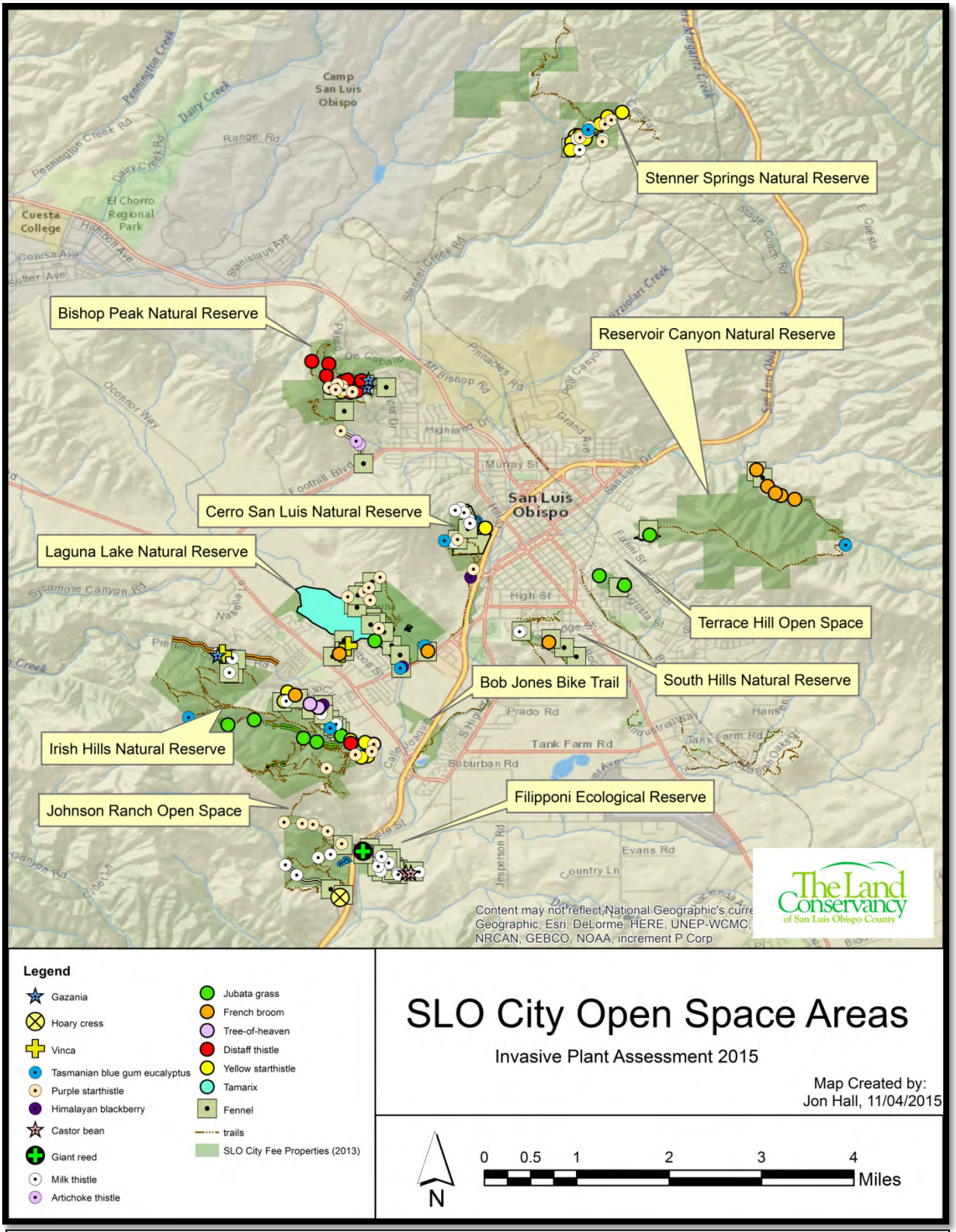
Priority	Location	Common Name	Goal Description	Goal	Spread	Threat	Logistics	Politics	Success	Future Cost	Prioritization Ranking
LOW	Reservoir Canyon Natural Reserve	Water beard grass	Sustained Control	1	1	1	1	1	1	1	7
	Stenner Springs Natural Reserve	Soft chess	Sustained Control	1	1	1	1	1	1	1	7
	Cerro San Luis Natural Reserve	Soft chess	Sustained Control	1	1	1	1	1	1	1	7
	Bob Jones Bike Trail	Soft chess	Sustained Control	1	1	1	1	1	1	1	7
	Filipponi Ecological Reserve	Soft chess	Sustained Control	1	1	1	1	1	1	1	7
	Laguna Lake Natural Reserve	Smutgrass	Sustained Control	1	1	1	1	1	1	1	7
	Laguna Lake Natural Reserve	Seaside barley	Sustained Control	1	1	1	1	1	1	1	7
	Laguna Lake Natural Reserve	Rattail sixweeks grass	Sustained Control	1	1	1	1	1	1	1	7
	Bob Jones Bike Trail	Rattail sixweeks grass	Sustained Control	1	1	1	1	1	1	1	7
	Filipponi Ecological Reserve	Rattail sixweeks grass	Sustained Control	1	1	1	1	1	1	1	7
	Laguna Lake Natural Reserve	Puna needle grass	Sustained Control	1	1	1	1	1	1	1	7
	Bishop Peak Natural Reserve	Nit grass	Sustained Control	1	1	1	1	1	1	1	7
	Reservoir Canyon Natural Reserve	Nit grass	Sustained Control	1	1	1	1	1	1	1	7
	Bishop Peak Natural Reserve	Goldentop	Sustained Control	1	1	1	1	1	1	1	7
	Reservoir Canyon Natural Reserve	Goldentop	Sustained Control	1	1	1	1	1	1	1	7
	Terrace Hill Open Space	Goldentop	Sustained Control	1	1	1	1	1	1	1	7
	Cerro San Luis Natural Reserve	Goldentop	Sustained Control	1	1	1	1	1	1	1	7
	Reservoir Canyon Natural Reserve	Foxtail barley	Sustained Control	1	1	1	1	1	1	1	7
	Bob Jones Bike Trail	Foxtail barley	Sustained Control	1	1	1	1	1	1	1	7
	Filipponi Ecological Reserve	Foxtail barley	Sustained Control	1	1	1	1	1	1	1	7
	Laguna Lake Natural Reserve	Farmer's foxtail	Sustained Control	1	1	1	1	1	1	1	7
	Laguna Lake Natural Reserve	Fall panic grass	Sustained Control	1	1	1	1	1	1	1	7
	Laguna Lake Natural Reserve	Ditch beard grass	Sustained Control	1	1	1	1	1	1	1	7
	Laguna Lake Natural Reserve	Brome fescue	Sustained Control	1	1	1	1	1	1	1	7
	Reservoir Canyon Natural Reserve	Annual beard grass	Sustained Control	1	1	1	1	1	1	1	7

3.3 Invasive Plant Mapping

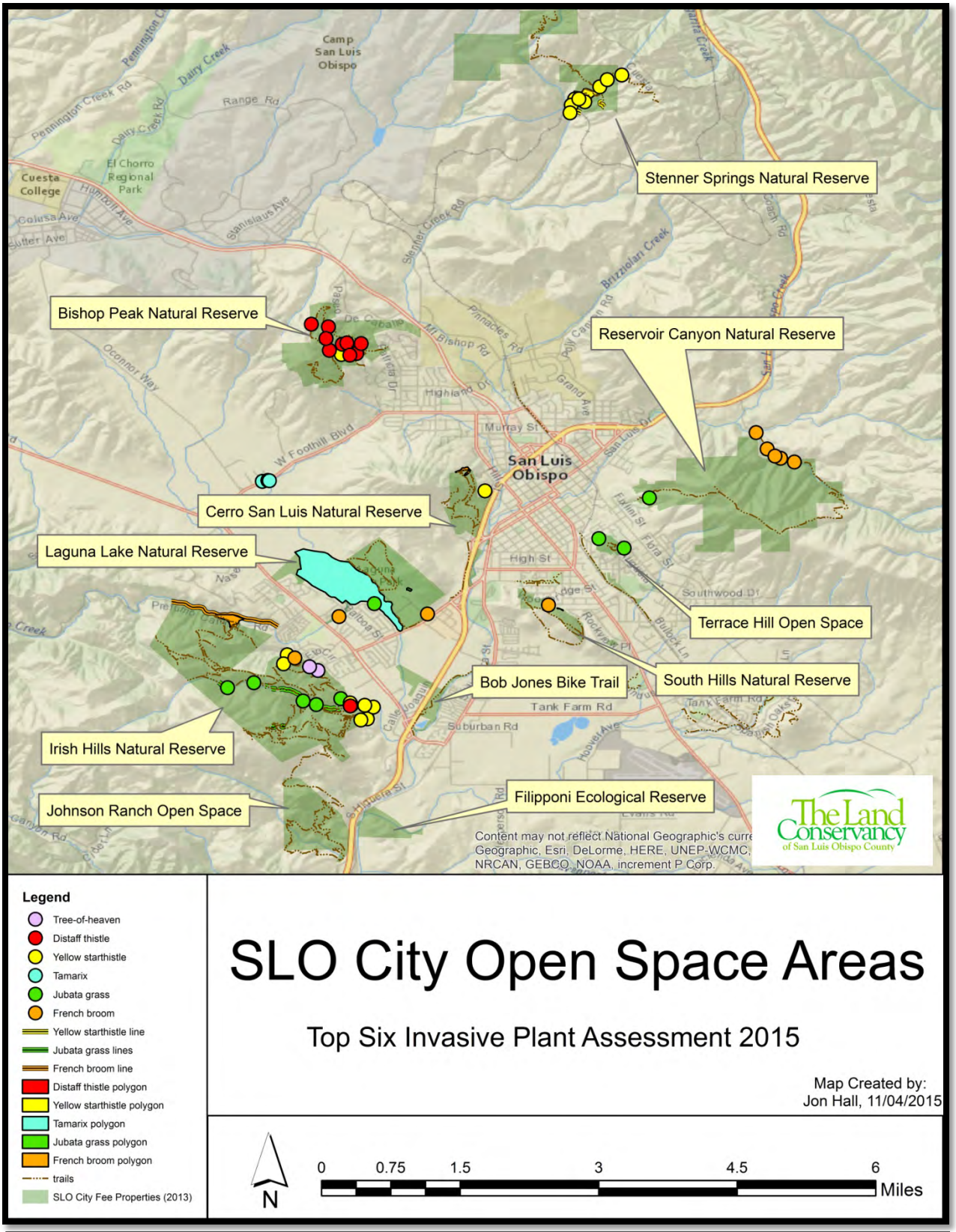
Twenty-one (21) weed species were identified as targets for mapping to inform future control strategies. These species included all High Priority ranked invasive plants, select medium and low priority invasive plants that present particular management concerns, and a list of "watchlist" species that aren't known to occur on city open space lands, but are part of regional eradication and control efforts through the San Luis Obispo Weed Management Area (SLOWMA). Priority species for mapping include:

PRIORITY SPECIES FOR MAPPING					
Common Name	**Species**	**Family**	**CDFA Listing**	**Cal-IPC Ranking**	**Priority**
Jubata grass	Cortaderia jubata	Poaceae		High	High
Yellow starthistle	Centaurea solstitialis	Asteraceae	CW	High	High
Woolly distaff thistle	Carthamus lanatus	Asteracea	BW	Moderate-Alert	High
Himalayan blackberry	Rubus armeniacus	Rosaceae		High	High
Saltcedar	Tamarix sp.	Tamaraciceae		High	High
French broom	Genista monspessulana	Fabaceae		High	High
Gazania	Gazania linearis	Asteraceae		Moderate-Alert	Medium
Onion weed	Asphodelus fistulosus	Asphodelaceae	W	Moderate-Alert	Medium
Fennel	Foeniculum vulgare	Apiaceae		High	Medium
Purple starthistle	Centaurea calcitrapa	Asteraceae		Moderate	Medium
Whitetop	Lepidium draba	Brassicaceae		Moderate	Medium
Milk thistle	Silybum marianum	Asteraceae		Limited	Medium
Cape ivy	Delairea odorata	Asteraceae		High	Medium
Tasmanian bluegum	Eucalyptus globulus	Myrtaceae		Moderate	Medium
Vinca	Vinca major	Apocynaceae		Moderate	Medium
Castor bean	Ricinus communis	Euphorbiaceae		Limited	Low
Giant reed	Arundo donax	Poaceae		High	Watch-List
Stinkwort	Dittrichea graveolens	Asteraceae		Moderate	Watch-List
Artichoke thistle	Cynara cardunculus	Asteraceae	BW	Moderate	Watch-List
Oblong spurge	Euphorbia oblongata	Euphorbiaceae	W	Limited	Watch-List
Medusahead	Elymus caput-medusae	Poaceae		High	Watch-List

In the spring of 2015, an extensive mapping effort was performed to visually assess and map the status of priority mapping targets (Map 2 & Map 3). In addition to location maps, a population assessment form was filled out for each observation (Appendix 3).



Map 2. Population assessment of all 21 target weed species on SLO City Open Space Areas.



Map 3. Population assessment of the six (6) high priority invasive plant targets on SLO City Open Space Areas.

4. SPECIFIC CONTROL PLANS FOR HIGH PRIORITY WEED SPECIES:

This section outlines specific control plans for the six (6) highest priority management concerns for San Luis Obispo Open Space Areas. These species include:

- Jubata grass (*Cortaderia jubata*)
- Yellow starthistle (*Centaurea solstitialis*)
- Woolly distaff thistle (*Carthamus lanatus*)
- Saltcedar (*Tamarix sp.*)
- French broom (*Genista monspessulana*)
- Tree-of-heaven (*Ailanthus altissima*)

Species description information and control option data was derived largely from the publication:

Ditomaso, J.M., G.B. Keyser et al. 2013. Weed Control in Natural Areas in the Western United States. Weed Research and information Center, University of California. 544 pp.

Scientific name: *Cortaderia jubata* **Common name:** Jubata grass

Updated : June 31, 2015

A. PRIORITY High

B. DESCRIPTION

Jubata grass tolerates a wide variety of soil types. It can be found in disturbed areas, dunes, bluffs, roadsides, road cuts, logged forests, grassland (including serpentine soils), riparian areas and undisturbed shrub land. Jubata grass is a large, perennial grass with showy plume-like inflorescences. The dense fibrous roots grow from shallow lateral rhizomes. Reproduction is only by seed. Seeds are very light and can transport long distances in the wind. Because seeds are so small, they are not long-lived in the seedbank. Germination occurs in fall after first rains, continuing through spring. It is native to mid-elevation regions of the Andes Mountains in Peru, Bolivia, Ecuador and Northern Argentina.

C. CURRENT DISTRIBUTION ON THE SITE

Jubata grass has a limited distribution on SLO City Open Space Areas, but can be found on numerous private property locations within the City and in several locations in the San Luis Creek riparian corridor (Map 4). It can be found in the Irish Hills Natural Reserve and Laguna Lake Natural Reserve and may be present in the Stenner Springs Natural Reserve. Occurrences favor enhanced moisture such as seeps, springs and riparian habitats. There are a number of occurrences in San Luis Creek and on private property adjoining Open Space Areas throughout the city.

D. DAMAGE & THREATS

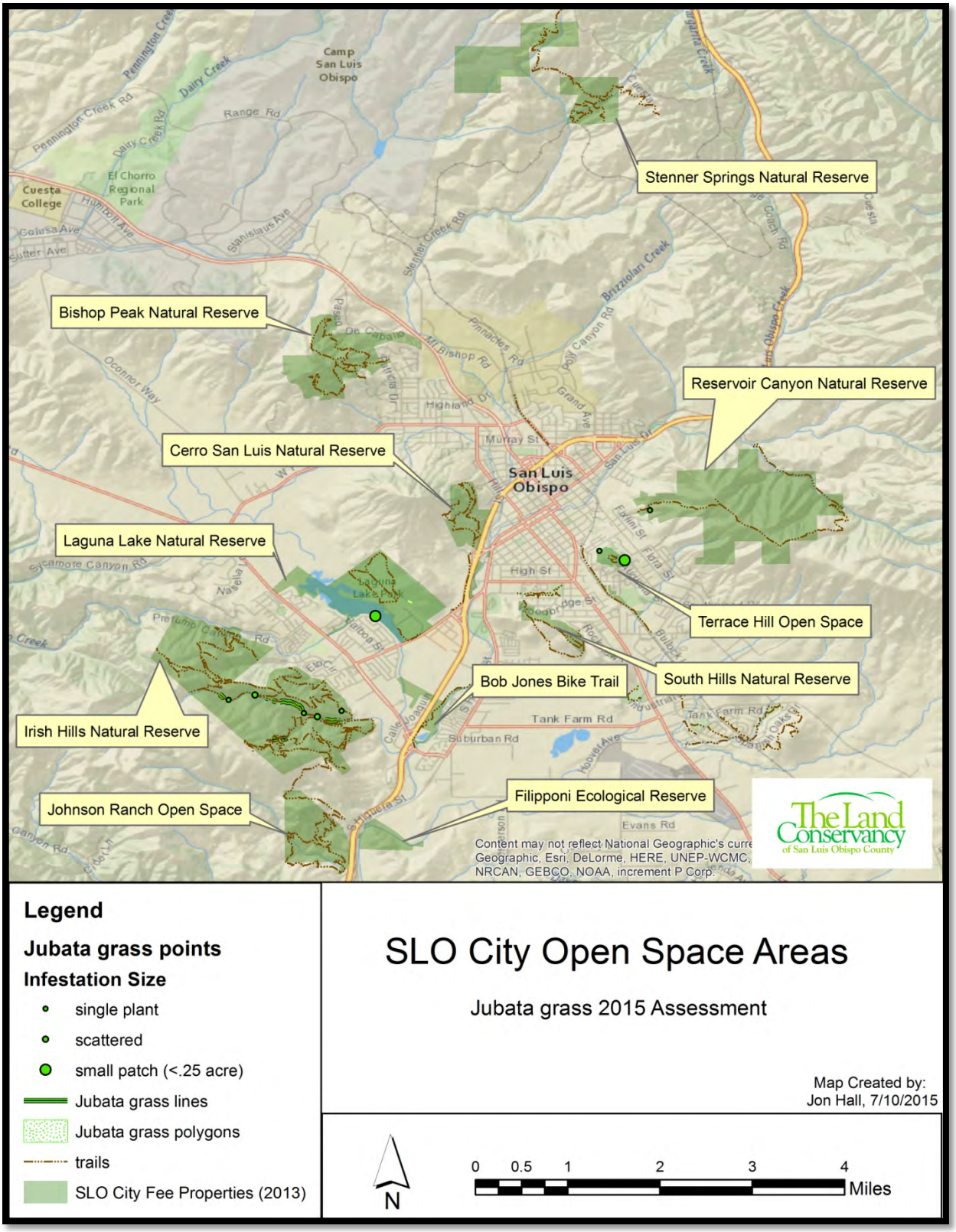
Mature plants are highly competitive displacing native vegetation. If left unchecked, it could displace the federally and state listed endangered Chorro creek bog thistle (*Cirsium fontinale var. obispoense*) found on serpentine seeps.

E. GOALS

The long-term goal for this species is complete eradication from SLO City Open Space Areas. Due to its limited distribution in the San Luis Obispo Area and its short lived seed bank, eradication is an achievable and appropriate goal.

F. OBJECTIVES (Measurable)

Eliminate jubata grass from all Open Space areas within 5 years.



Map 4. Overview map showing geographic distribution of jubata grass (*Cortaderia jubata*) on City of SLO Open Space Areas.

G. MANAGEMENT OPTIONS

Viable control options are:

(1) No treatment;

(2) (Biological); There are currently no biological control agents available for *Cortaderia jubata*.

(3) (Cultural); Heavily mulching bare sites or high density plantings of desirable species may reduce seedling establishment. Cattle grazing has not proven to be a viable option.

(4) (Mechanical); Hand pulling or mechanical removal with a Pulaski has proven effective for smaller plants. Removed plants should be inverted to discourage re-rooting. Larger plants are more difficult to remove, but it is possible with a large chainsaw or weed-whacker used to expose the base of the plant for better removal of the crown. If plants can't be controlled, plumes can be removed to minimize contributions to the seedbank.

(5) (Chemical); The use of herbicides should always follow label instructions. There are numerous herbicides that have been shown to be effective at controlling jubata grass.

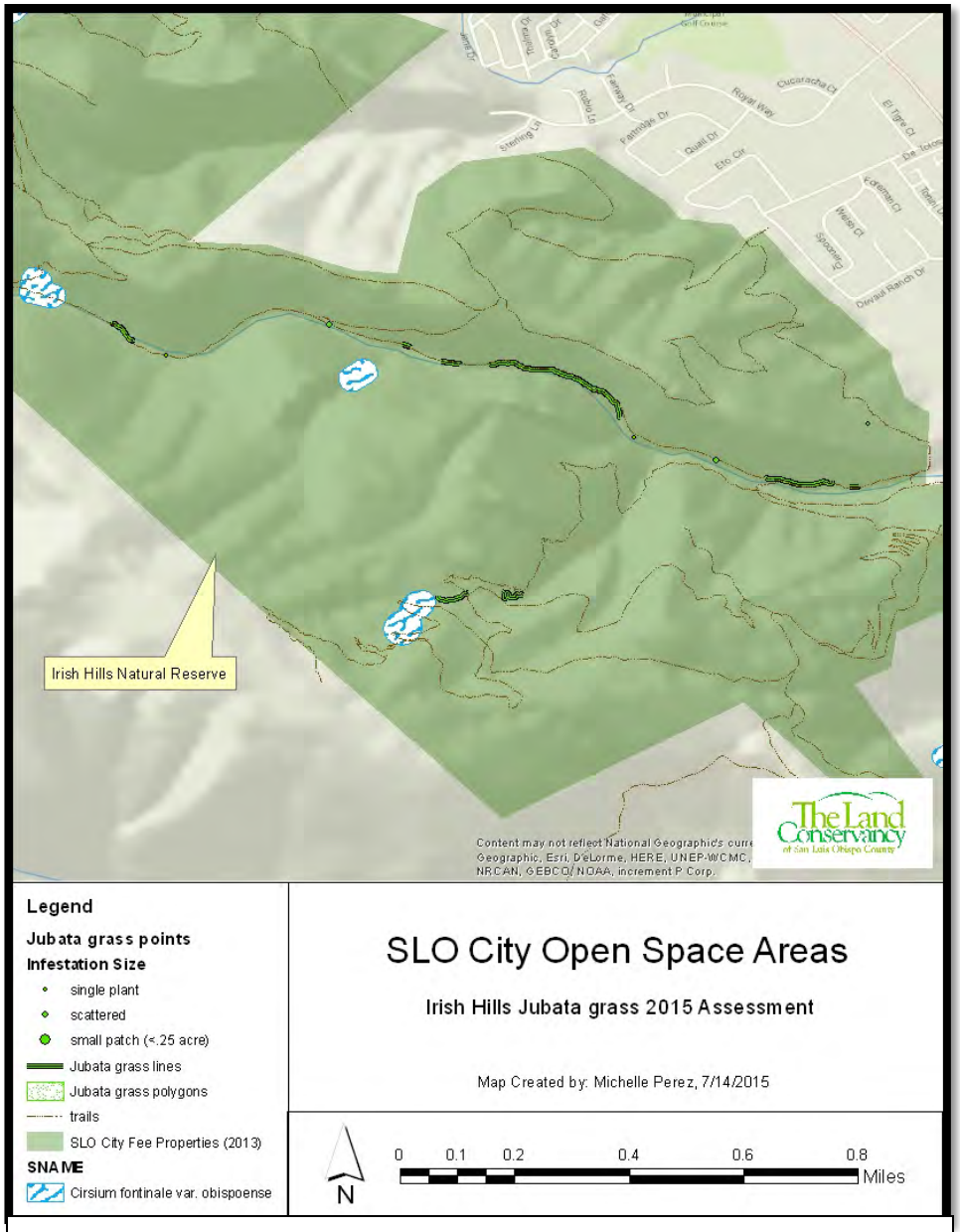
LIPID SYNTHESIS INHIBITORS	
Fluazifop *Fusilade*	**Application Type(s): High-volume spray-to-wet s**pot treatment; Low volume treatment. **Timing**: Postemergence. Best in late summer or fall, after flowering when translocation of herbicide to base of tillers and rhizomes is at its peak. **Remarks:** In studies conducted by UC Davis, **c**ontrol of jubatagrass with fluazifop was inconsistent. It has no soil residual activity. Other grass herbicides were not as effective.
AROMATIC AMINO ACID INHIBITORS	
Glyphosate *Roundup Pro Conc, Aquaneat, others*	**Application Type(s):** Broadcast treatment; High-volume spray-to-wet spot treatment; Low-volume treatment; Wick application **Timing:** Postemergence. Best in late summer or fall, after flowering when translocation of herbicide to base of tillers and rhizomes is at its peak. **Remarks:** In studies conducted by UC Davis, Glyphosate provided the most consistent jubatagrass control with all plant sizes in both fall and early summer. Low volume treatment and wick applications gave the best and most consistent control.
BRANCHED-CHAIN AMINO ACID INHIBITORS	
Imazapyr *Habitat, Polaris*	**Application Type(s):** High-volume spray-to-wet spot treatment **Timing:** Postemergence. Best in late summer or fall, after flowering when translocation of herbicide to base of tillers and rhizomes is at its peak. **Remarks:** In studies conducted by UC Davis, results were inconsistent from site to site and year to year. Imazapyr is a slow-acting systemic herbicide and may take a year or two to achieve effective control on *Cortaderia.*

H. ACTIONS PLANNED (Treatments and monitoring)

Actions for specific Open Space Areas –

Irish Hills Natural Reserve:

Presently, jubata grass is restricted to the Froom Creek Area and surrounding hillsides (Map 5). Previous control work has been done by the SLO County Department of Agriculture. This work predominately removed jubata grass from the upland areas surrounding Froom Creek but had not yet begun formal treatment of the Froom Creek drainage. In 2014 The Land Conservancy of San Luis Obispo County (The Land Conservancy) working under a contract from the City of San Luis Obispo, surveyed and removed all known jubata grass plants from the Froom Creek drainage. Follow-up surveys and re-treatments occurred in spring 2015 in the Froom Creek drainage and surrounding upland areas. The SLO County Department of Agriculture worked with the Land Conservancy on upland surveys to ensure continuity of treatment. Future work should involve annual surveys in the springtime/early summer after seedling germination. Any individuals found should be removed. For small plants, manual removal is appropriate. Plants not suitable for manual removal (i.e. large size or steep terrain) will be treated with a low volume application of a glyphosate containing product. It is recommended that this cycle of survey and treatment occur over the next five years, until the seedbank is eliminated.

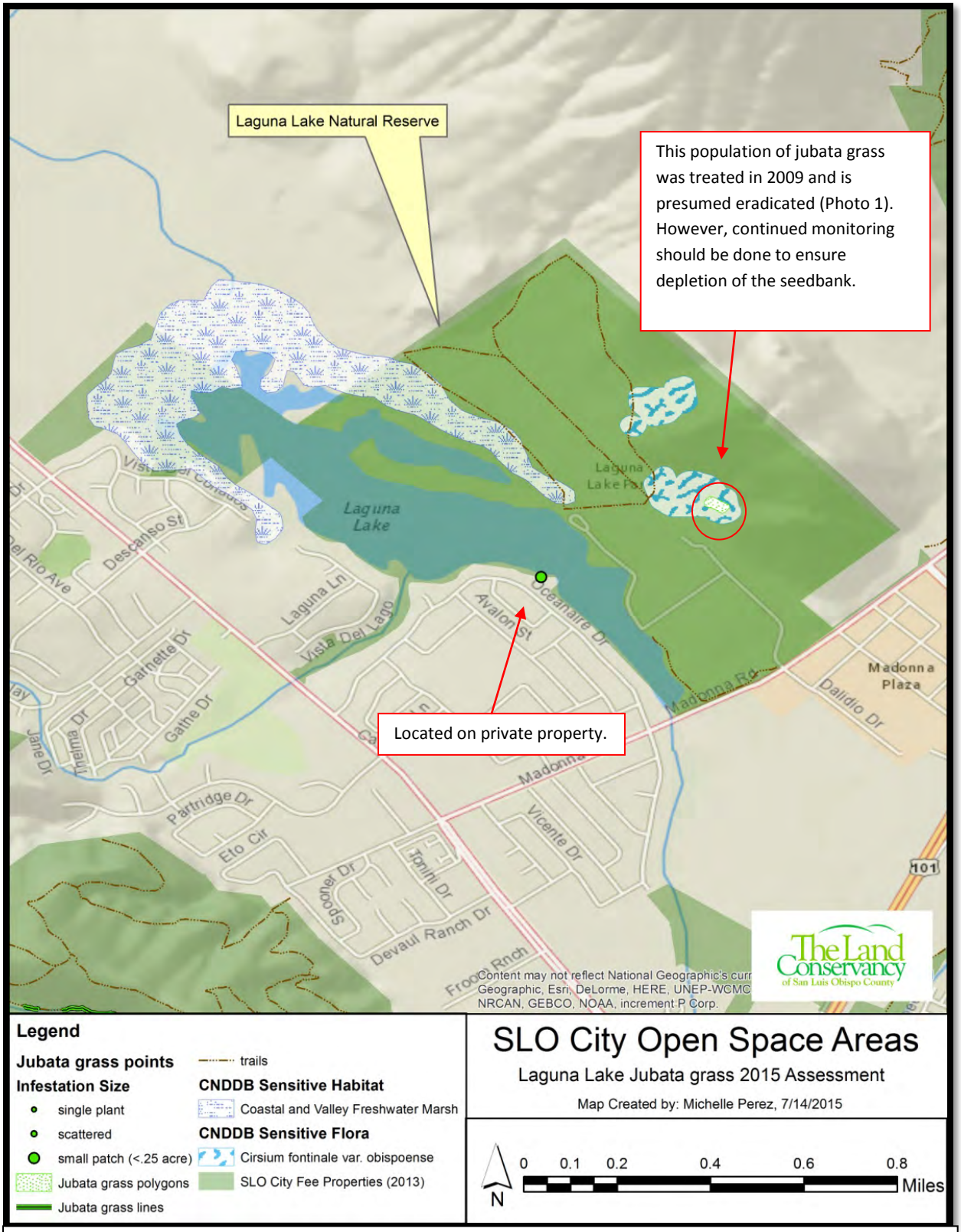


Map 5. Jubata grass population locations overlaid with locations of the endangered Chorro Creek Bog thistle. All mapped jubata grass locations are currently under management.

Laguna Lake Natural Reserve: Jubata grass has previously been found growing in serpentine seeps (Map 6)(Photo 1). The SLO County Department of Agriculture began removal of this population in 2009. All populations have been eliminated, and the project is now in the survey and monitoring phase. Any new jubata grass plants that come up can easily be removed by hand. Care should be taken while working in serpentine seeps to avoid the state and federally endangered Chorro Creek Bog thistle (*Cirsium fontinale* var. obispoense). There is also a population on private property on the edge of the reserve which falls under the *Category I Control Action*:

> *Present in region but not in SLO City Open Space Areas. Contact cooperating agencies and landowners. Track spread if near open space area. Prevention of species establishment inside open space areas eliminates the need for control actions.*

Photo 1: Taken in 2009 by Marc Lea (SLO County Department of Agriculture), *Cortaderia jubata* growing in serpentine seep at Laguna Lake Natural Reserve.



Map 6. Jubata grass locations in Laguna Lake Natural Reserve overlaid with Chorro Creek Bog thistle (*Cirsium fontinale* var. obispoense) and sensitive habitats.

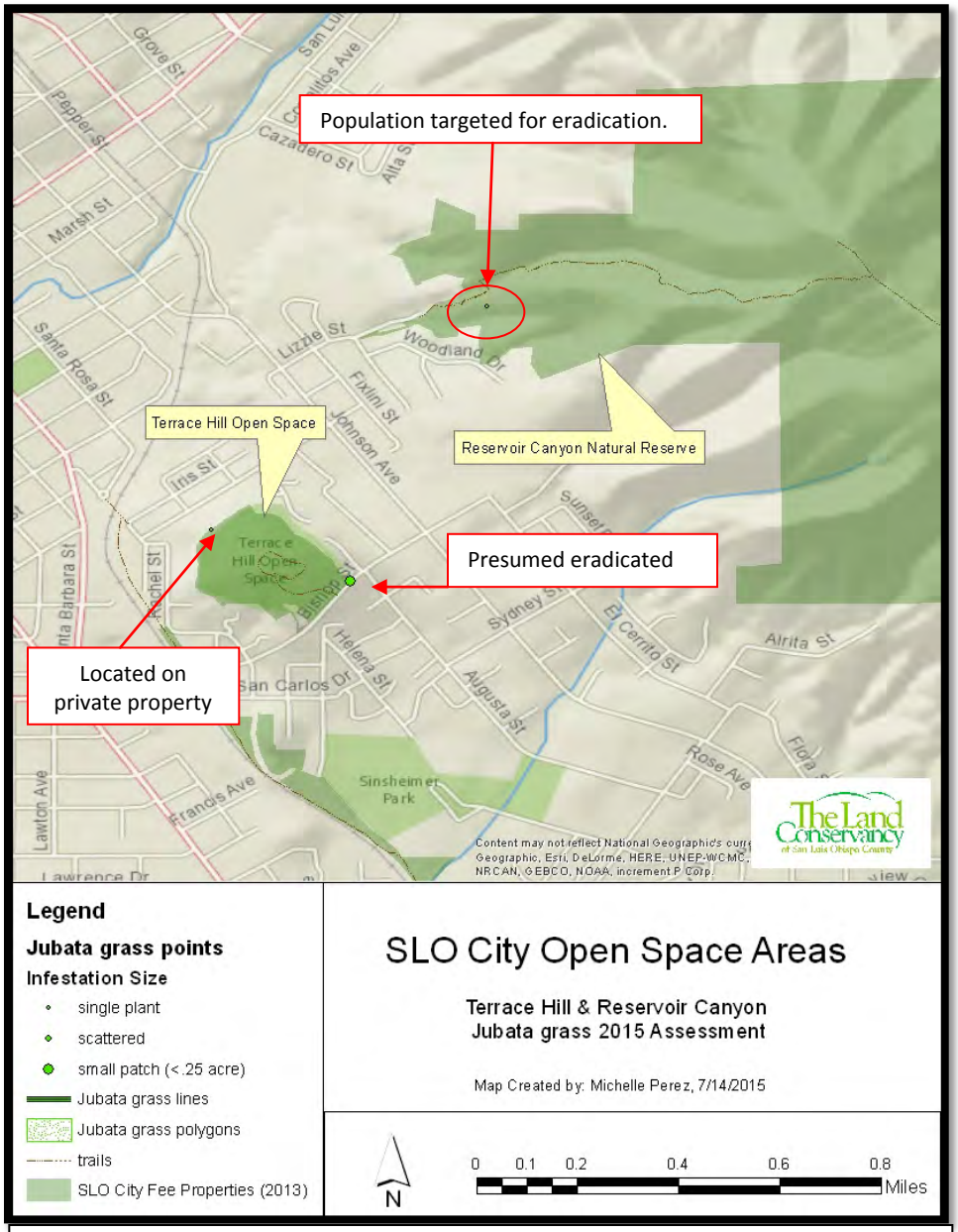
Terrace Hills Open Space Area: There is only one (1) population of jubata grass in the Terrace Hills Open Space Area. This population is dead and appears to have been controlled at some point in the past. It is presumed eradicated, but future monitoring is recommended to ensure the seedbank is no longer viable. The other population is on private property (Map 7) and falls under the *Category I Control Action*:

> *Present in region but not in SLO City Open Space Areas. Contact cooperating agencies and landowners. Track spread if near open space area. Prevention of species establishment inside open space areas eliminates the need for control actions.*

Reservoir Canyon Natural Reserve: There were only a few jubata grass plants detected in the Reservoir Canyon Natural Reserve. Due to the small size, and neighboring geographic distribution the course of action identified is *Category II:*

> *Present in SLO City Open Space Areas as individuals or small, localized populations. Remove by hand or other precision control technique, and maintain a record of actions. Monitor the removal sites, following up with additional removal as needed. This kind of diligence keeps control costs low.*

Surveys should also be done on neighboring properties to identify potential seed sources.



Map 7. Jubata grass (*Cortaderia jubata*) populations in Terrace Hills Open Space Area and Reservoir Canyon Natural Reserve.

I. HOW ACTIONS WILL BE EVALUATED (Criteria for success)

Success will be determined by removal of jubata grass from all SLO City Open Space Areas with monitoring indicating three years with no individuals detected. Yearly monitoring of all previously treated populations in the spring or early summer will occur using the Invasive Plant Assessment Form (Appendix C).

J. RESOURCE NEEDS

Time and cost estimates will be inserted later upon consultation with the SLO City Natural Resource Manager, Robert Hill.

Permits – The following list of permits may be required for jubata grass control work:

CA Department of Fish and Wildlife (CDFW) 2081(a) Research and Management Permit – If work is close to or may impact a state listed species under the California Endangered Species Act, CDFW should be consulted with about which permits apply to the situation. For work in serpentine seeps around the Chorro Creek Bog thistle (*Cirsium fontinale* var. obispoense), most likely a 2081(a) Research and Management Permit would be recommended.

State Water Resources Control Board National Pollution Elimination System (NPDES) Pesticide Permit for Weed Control - The State Water Resources Control Board adopted the Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications, Water Quality Order 2013-0002-DWQ, for the reissuance of General NPDES Permit CAG990005 in June 2013. Order 2013-0002-DWQ became effective on December 1, 2013.

This General Permit covers the point source discharge to waters of the United States of residues resulting from pesticide applications using products containing 2,4-D, acrolein, copper, diquat, endothall, fluridone, glyphosate, imazamox, imazapyr, penoxsulam, sodium carbonate peroxyhydrate, and triclopyr-based algaecides and aquatic herbicides, and adjuvants containing ingredients represented by the surrogate nonylphenol.

It is possible this permit would be needed for control of jubata grass in Froom Creek if applications are made when there is water in the creek and there will be a point source discharge to the water column through direct application or drift. If this permit is needed, a corresponding "Aquatic Pesticide Application Plan" or APAP must be prepared. Yearly fees are also associated with this permit.

K. RESULTS OF EVALUATION

(This section is to be filled in later, preferably within 1 year, when monitoring data has been taken and evaluated, at least preliminarily. The evaluation should be used to determine whether any of the sections B-K above should be modified.)

Scientific name: *Centaurea solstitialis* **Common name:** Yellow starthistle

Updated : June 31, 2015

A. PRIORITY High

B. DESCRIPTION

Yellow starthistle is native to southern Europe. It can be found in open disturbed sites, grassland/ rangeland, open woodlands, crop fields, pastures, roadsides and waste places. Light is a limiting factor for this plant. It does poorly in shaded areas. Yellow starthistle is an herbaceous winter annual, but can sometimes grow as a biennial. Large flushes of seeds germinate after the first fall rains, but smaller germination flushes can occur during winter and early spring. Most of the seedbank is only viable for 4 years, although some seeds have been known to survive for up to 10 years under field conditions. Plants form a basal rosette of leaves until mid-spring when they bolt and begin flowering in early summer. The taproot can extend deep into the soil (>6 ft) allowing plants to utilize deep soil moisture not available to other annual species, particularly grasses. Most seeds fall near the parent plant, but they can be transported by wind or can attach to machinery in mud. Seeds could also be transported in mud attached to mountain bike tires or hikers shoes. Frequent introductions have also been recorded in contaminated hay used for livestock or erosion control.

C. CURRENT DISTRIBUTION ON THE SITE

Yellow starthistle is absent from many of SLO City's Open Space Areas. Infestations can be found in the Stenner Springs Natural Reserve, as an incipient population at the Bishop Peak Natural Reserve, and in limited quantities on the Irish Hills Natural Reserve. It can also be found on neighboring properties to the Cerro San Luis Natural Reserve and the Irish Hills Natural Reserve (Map 8). Yellow starthistle can be found throughout the City of San Luis Obispo but can still be considered at manageable levels.

D. DAMAGE & THREATS

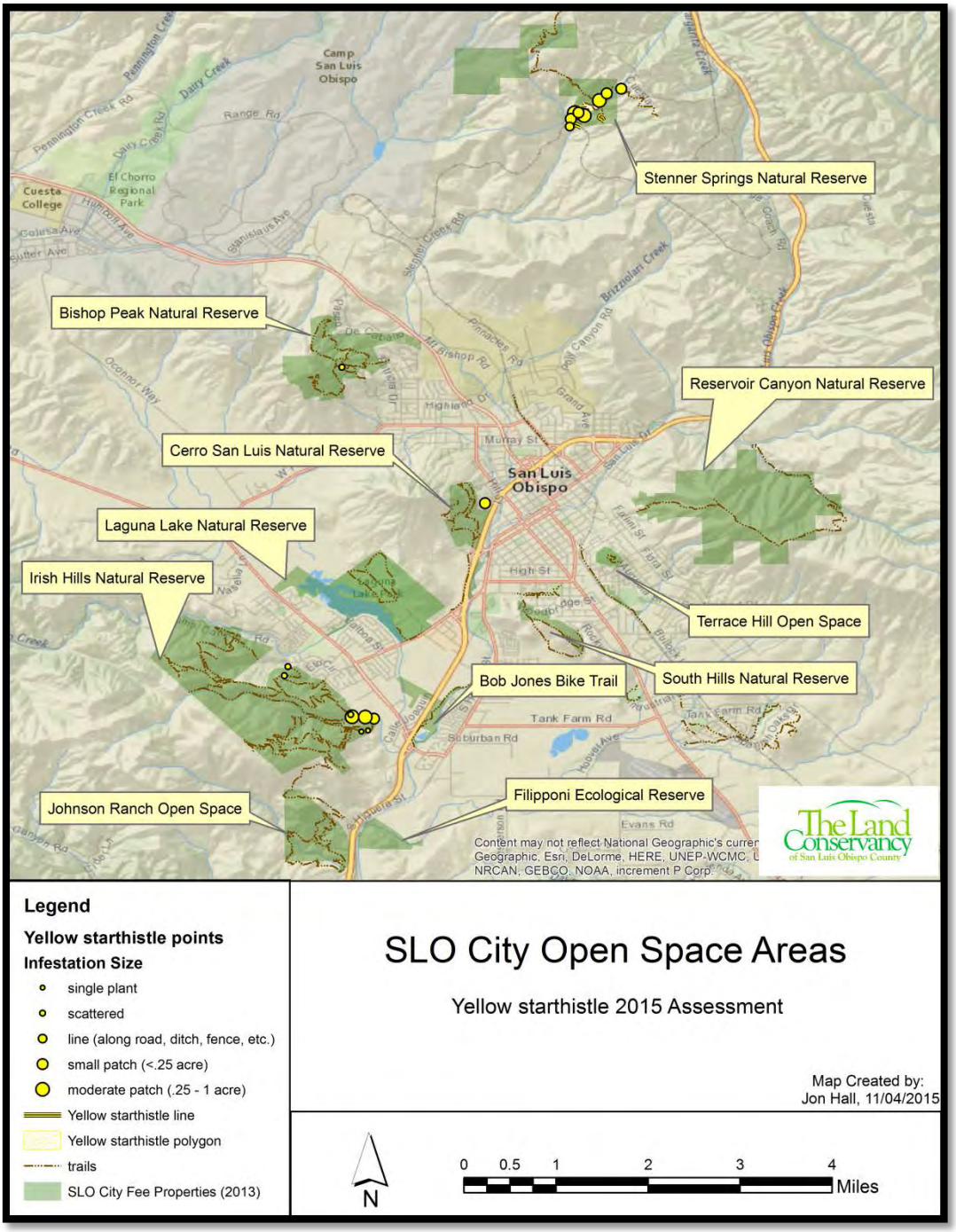
Plants are highly competitive, typically developing dense monocultures displacing desirable vegetation in rangelands, natural areas, roadsides and other places. Yellow starthistle is considered one of the most serious rangeland weeds in the western United States. Its dense growth and spiny flower heads reduces the quality of grazing land and impacts passive recreational activities like mountain biking and hiking.

E. GOALS

The long-term goal for this species is eradication from Bishop Peak Natural Reserve, prevention from SLO City Open Space Areas not currently infested, and to eliminate satellite populations and begin perimeter control at the Stenner Springs natural Reserve and Irish Hills Natural Reserve.

F. OBJECTIVES (Measurable)

Eradicate yellow starthistle from Bishop Peak Natural Reserve within 5 years. Eliminate yellow starthistle from Irish Hills Natural Reserve within 5 years. Reduce yellow starthistle infestation by 70% of 2015 levels at Stenner Springs Natural Reserve within 5 years with 95% reduction within 10 years.



Map 8. Overview map showing geographic distribution of yellow starthistle (*Centaurea solstitialis*) on City of SLO Open Space Areas.

G. MANAGEMENT OPTIONS
Viable control options include:

(1) No treatment;

(2) (Biological); Six insects have become established for the control of yellow starthistle in the western United States. These include three species of weevils (seed-head weevil [*Bangasternus orientalis*], flower weevil [*Larinus curtus*], and the hairy weevil [*Eustenopus villousus]*), and three species of flies (seed-head fly [*Uropha sirunaseva*], peacock fly [*Chaetorellia australis*], and the false peacock fly [*Chaetorellia succinea*]). Of these, only two insects, *E. villosus* and *C. succinea* have any significant impact on reproduction. The combination of these two insects reduces seed production by 43 to 76%. Although this level of suppression is not sufficient to provide long-term yellow starthistle management, the use of biological control agents can be an important component of an integrated management approach. Biological control agents for yellow starthistle have previously been released by the SLO County Department of Agriculture throughout the county. One or more of these organisms may already be established in San Luis Obispo, and simply need encouragement to help provide control. Eradication is not a control option with biological control, but a reduction in density may be observed.

(3) (Cultural);
Grazing - High-intensity, short-duration grazing has shown moderate success in managing yellow starthistle seedbanks. It can be a useful tool in an integrated management program.

Fire - Prescribed fire can provide control if conducted at the proper timing. Repeat burning over consecutive years is desirable, but a single burn has been used to good effect as a tool in an integrated approach. The best results have been seen with one year of controlled burn that flushes the seedbank, followed by two successive years of herbicide application.

Flaming – flaming seedlings with a propane torch has been used on yellow starthistle, but the technique is non-selective and results are inconsistent. There is a fire hazard when using flaming as a tool. This technique should only be done when it is raining or the ground is wet.

(4) (Mechanical);
Manual Removal – manual removal is most effective when dealing with small patches or as follow-up for plants missed during another control technique. The best timing for manual removal is during early bolting before the plant produces viable seed.

Mowing – mowing is most effective when 2 to 5% of the total population of seedheads is in bloom. Mowing too early can actually increase seed production. To successfully manage yellow starthistle with mowing, multiple years of continuous treatment is required. It is often part of an integrated approach and not very successful by itself. Mowing is not feasible in many locations due to rocks, steep terrain and the possibility of starting a fire. Mowing is not always effective and can decrease the reproductive

efforts of insect biocontrol agents, injure late growing native plants, and reduce fall and winter forage for wildlife and livestock.

Tillage – This is an effective and appropriate tool for roadsides and croplands. It is not an appropriate tool in rangelands and natural areas because it can damage and disrupt native species, increase erosion, alter the soil structure, and expose the soil for rapid re-infestation if subsequent rainfall occurs.

(5) (Chemical); The use of herbicides should always follow the label. There are numerous herbicides that have been shown to be effective at controlling yellow starthistle.

GROWTH REGULATORS	
Aminopyralid *Milestone*	**Application type(s):** Broadcast; High-volume spray-to-wet spot treatment **Timing**: Preemergence or postemergence. Postemergence applications should be applied from seedling to the mid-rosette stage. **Remarks:** Aminopyralid is one of the most effective herbicides for the control of yellow starthistle. It is safe on grasses, although can impact them at higher rates. Aminopyralid has a longer residual and higher activity than clopyralid. Other members of the Asteraceae and Fabaceae are very sensitive to aminopyralid.
Clopyralid *Transline*	**Application type(s):** Broadcast; High-volume spray-to-wet spot treatment **Timing**: Preemergence or postemergence. Postemergence applications should be applied from late rosette to early bolting stage. **Remarks:** Clopyralid gives excellent control of yellow starthistle. It is safe on grassess. Other members of the Asteraceae and Fabaceae can be sensitive to clopyralid. Clopyralid does not bind very tightly to soil and thus can leach into water easily. Once suspended in the water column, it will not breakdown until it falls out with the sediment.
Triclopyr *Garlon 3A, Garlon 4 Ultra*	**Application type(s):** Broadcast; High-volume spray-to-wet spot treatment **Timing**: Postemergence from seedling to bolting stage. **Remarks:** Triclopyr has little to no residual activity. It is broadleaf-selective and typically does not harm grasses. *Garlon 4 Ultra* is formulated as an ester. In warm temperatures (>80^{o}F), there is arisk of volatilization and off-target damage.
AROMATIC AMINO ACID INHIBITORS	
Glyphosate *Roundup Pro Conc, Aquaneat, others*	**Application type(s):** Broadcast; High-volume spray-to-wet spot treatment **Timing:** Postemergence to plant from bolting to beginning of flowering. **Remarks:** Glyphosate is the most effective herbicide for late season control. It has no soil activity and is nonselective.
BRANCHED-CHAIN AMINO ACID INHIBITORS	
Imazapyr *Habitat, Polaris*	**Application type(s):** Broadcast; High-volume spray-to-wet spot treatment **Timing:** Has preemergent and some postemergent properties. It has a long soil residual life. **Remarks:** Seldom used for yellow starthistle but has been shown to be somewhat effective. Broad spectrum control, will kill grasses as well.

H. ACTIONS PLANNED (Treatments and monitoring)

Actions for specific Open Space Areas –

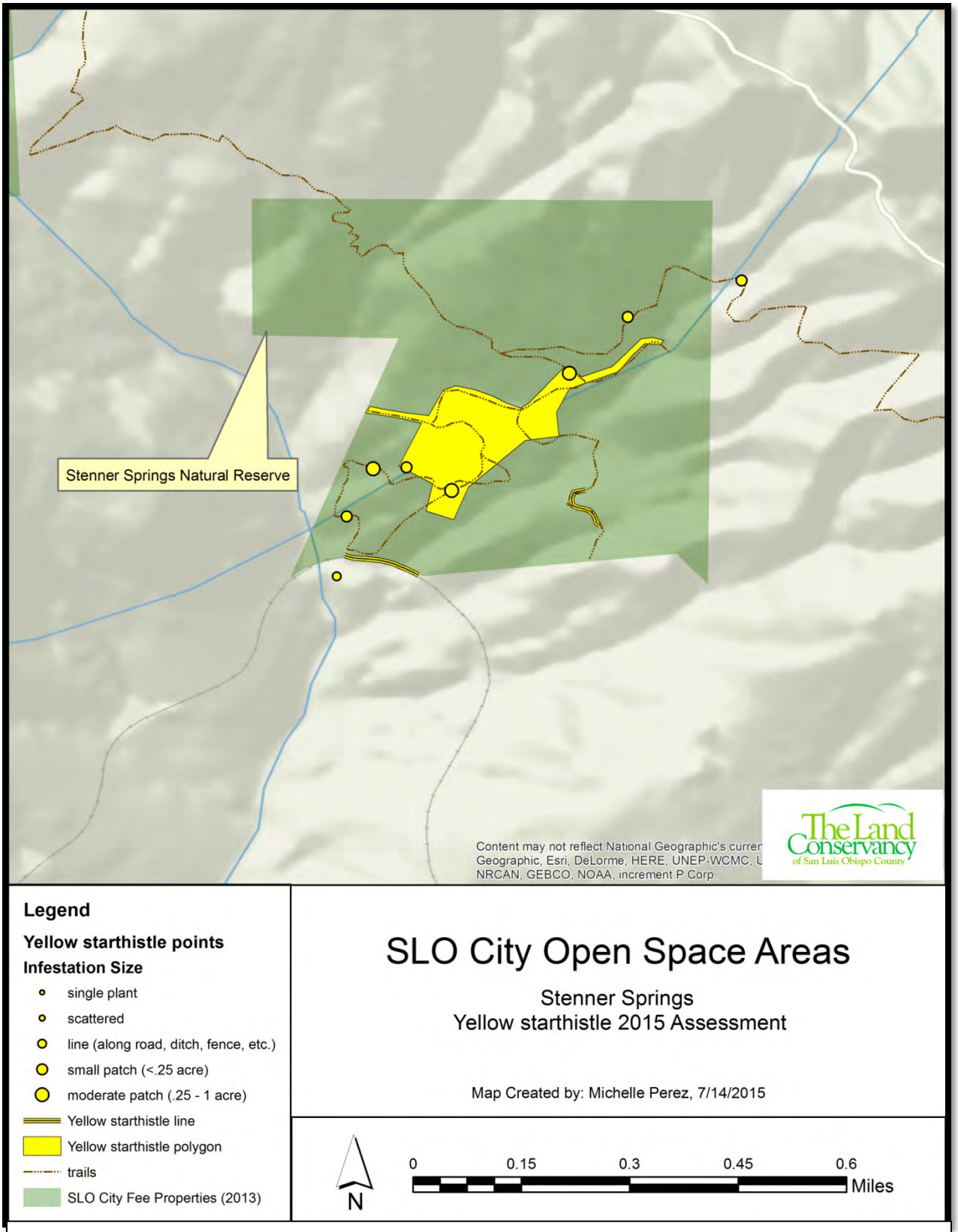
Stenner Springs Natural Reserve: There's approximately 15+ acres infested with yellow starthistle on the Stenner Springs Natural Reserve. Infestations can be found along trails, on roadsides and throughout the grassland parts of the reserve (Map 9). There are also established infestations on neighboring properties. Because of the areas heavy use by mountain bikers, there is a risk that seeds could get transported on equipment and bike tires to other City owned Open Space Areas with recreational trails. The size and distribution of this infestation lends it towards the *Category III Control Action:*

> *Present as large infestations in parts of SLO City Open Space Areas. Native plant communities are disrupted and native species displaced from infested areas. Remove outliers first. If possible, eliminate the exotic seed bank in outlier areas after mature plants have been removed to deter re-establishment. Map large infestations. Plan larger attack projects. Resources permitting, implement one or more large-scale projects, aimed as follows:*
>
> a. *Contain spread to within infested areas.*
> b. *Reduce the number and size of infestations, restore native species to bared sites, and follow a strategy that minimizes dispersal and re-infestation. In general, treat the smallest, furthest outlying areas first.*
> c. *Eliminate the larger infestations, moving from the fringes toward the source of seed dispersal.*

Although widespread, access to the site is good, allowing for numerous management options. The overall strategy should target outlier populations first and then begin control on the perimeter of the larger population working towards the center. Fire could be a good tool, but because of proximity to highly combustible chaparral, coastal scrub and Tasmanian blue gum eucalyptus communities, the possibility for a controlled burn to spread to non-target areas may be too high a risk. The preferred tool for this site, providing the best control with the least impact, would be a low-toxicity selective herbicide (aminopyralid or clopyralid) sprayed as a broadcast technique in heavily infested areas or high-volume spot spray in outlier populations. These herbicides are broad-leaf specific which allows the use of "competitive exclusion" as a control technique in grassland areas. There are healthy native grass communities in this area. It is anticipated that natural recruitment will help expand this grassland, but in certain areas, re-seeding with site appropriate native grasses may be desirable.

Additional work should be done through the SLO County Weed Management Area to coordinate similar control efforts with neighboring property owners like California Polytechnic State University and Camp San Luis Obispo.

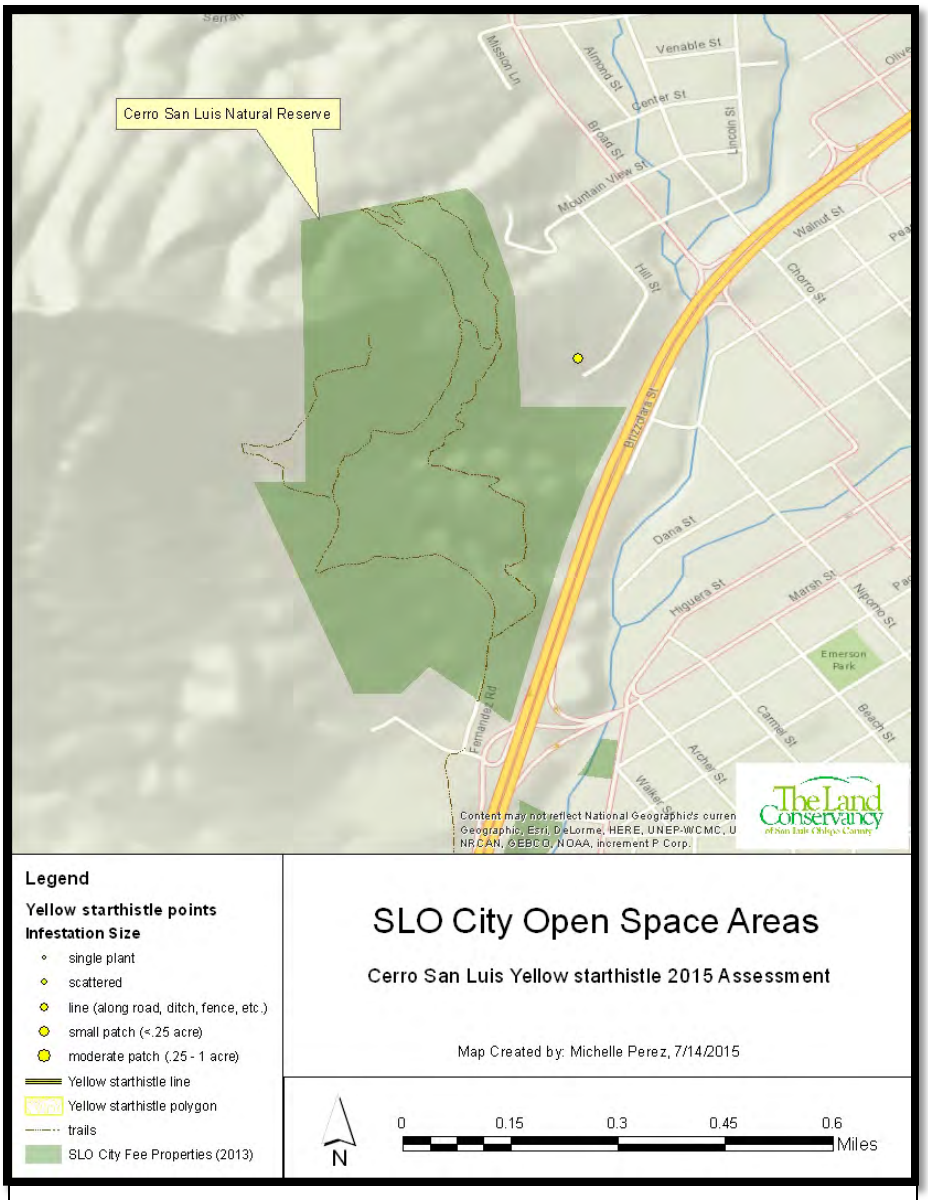
Initial monitoring and site assessment should begin in mid spring with initial herbicide applications happening in early to mid rosette stage. Follow up surveys should be performed at two week intervals after the initial treatment to inform the need for follow-up treatments. Treatments will go through early summer.



Map 9.Yellow starthistle (*Centaurea solstitialis*) 2015 population assessment in Stenner Springs Natural Reserve.

Cerro San Luis Natural Reserve: During the 2015 SLO City Open Space Area Invasive Plant Assessment, no yellow starthistle was detected on the Cerro San Luis Natural Reserve. However, there was one isolated population found near the Hill Street entrance (Map 10) that should be addressed before it spreads onto the neighboring Open Space Area. This population falls under a *Category I Control Action*:

> *Present in region but not in SLO City Open Space Areas. Contact cooperating agencies and landowners. Track spread if near open space area. Prevention of species establishment inside open space areas eliminates the need for control actions.*

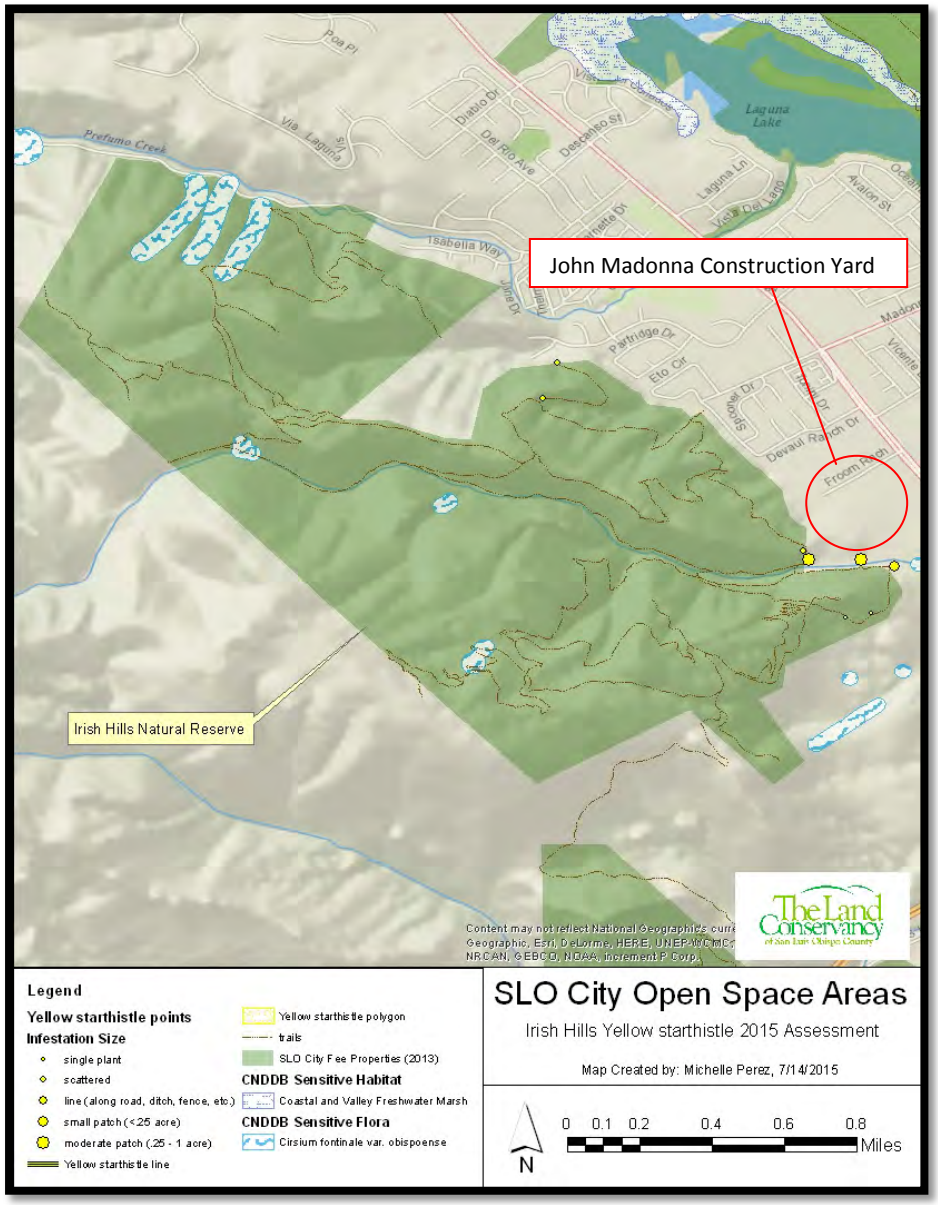


Map 10.Yellow starthistle (*Centaurea solstitialis*) population location near the Cerro San Luis Natural Reserve.

Irish Hills Natural Reserve: At the Irish Hills Natural Reserve yellow starthistle (*C. solstitialis*) is just beginning to encroach into the reserve from the western perimeter (Map 11). The largest of these populations is at the John Madonna Construction (JMC)yard. On the reserve itself, there are only a few small outlier infestations. This situation falls under a *Category II Management Action:*

> *Present in SLO City Open Space Areas as individuals or small, localized populations. Remove by hand or other precision control technique, and maintain a record of actions. Monitor the removal sites, following up with additional removal as needed. This kind of diligence keeps control costs low.*

This is best accomplished through careful monitoring starting in early spring and continuing into midsummer. In most cases, individual or small patches found can be recorded and removed by hand. If flower heads have formed, plants should be bagged and removed from the site. If infestations are larger than 100 sq ft, spot treatment with a low toxicity, selective herbicide (clopyralid or aminopyralid) may be required. In addition to outlier removal and perimeter monitoring, a coordinated effort between JMC, the SLO County Weed Management Area and the SLO County Department of Agriculture should be pursued to eliminate this seed source. Not only does this infested construction yard represent a seed source for infesting the surrounding areas, but there is a high probability that yellow starthistle can be transported throughout SLO County.

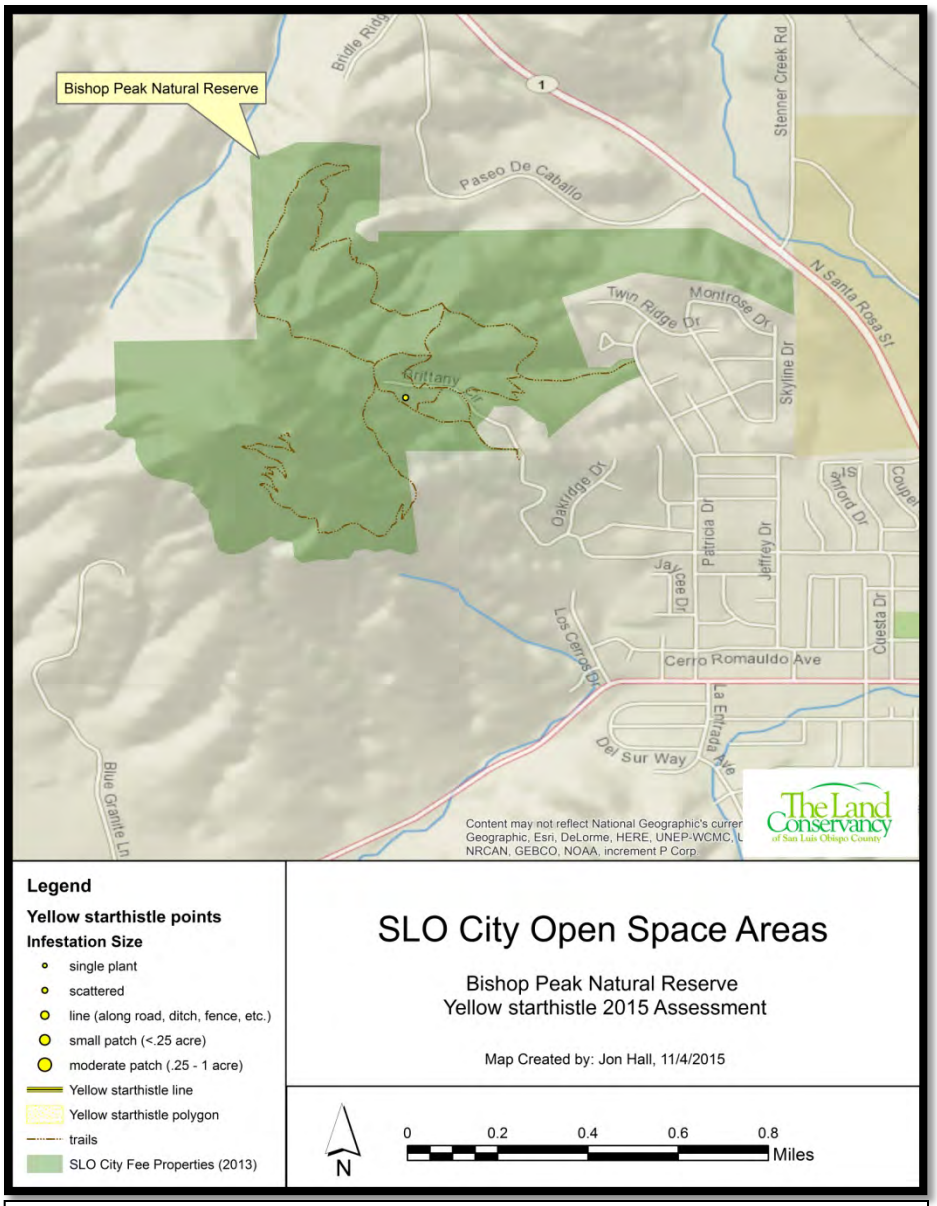


Map 11. Yellow starthistle (*Centaurea solstitialis*) population assessment at the Irish Hills Natural Reserve overlaid with the federally and state listed Chorro Creek Bog thistle (*Cirsium fontinale* var. obispoense).

Bishop Peak Natural Reserve: At the Bishop Peak Natural Reserve there is one incipient population of yellow starthistle (*C. solstitialis*) (Map 12). This population is still relatively small, but is surrounded by a larger population of woolly distaff thistle (*C. lanatus*). This situation falls under a *Category II Management Action:*

> *Present in SLO City Open Space Areas as individuals or small, localized populations. Remove by hand or other precision control technique, and maintain a record of actions. Monitor the removal sites, following up with additional removal as needed. This kind of diligence keeps control costs low.*

This is best accomplished through careful monitoring starting in early spring and continuing into midsummer. In most cases, individual or small patches found can be recorded and removed by hand. If flower heads have formed, plants should be bagged and removed from the site. If infestations are larger than 100 sq ft, spot treatment with a low toxicity, selective herbicide (clopyralid or aminopyralid) may be required. In 2015 the entire population was removed by hand. The effort only required 2 person hours and filled one large bag. Although a few plants had set seed, the seed bank at this time is relatively small. This is an excellent target for eradication. Hand removal is an appropriate method of control for this population. However, if the surrounding woolly distaff thistle (*C. lanatus*) infestation is treated chemically, control efforts should be coordinated to include both plant species.



Map 12. Yellow starthistle (*Centaurea solstitialis*) population location in the Bishop Peak Natural Reserve.

I. HOW ACTIONS WILL BE EVALUATED (Criteria for success)

For the Stenner Springs Natural Reserve, success will be determined by a reduction of 70% of 2015 levels within 5 years and a 95% reduction within 10 years. This will be evaluated through both before and after photos, detailed GIS mapping and annual monitoring using the Invasive Plant Assessment Forms (Appendix C).

For the Irish Hills Natural Reserve, the objective is elimination of yellow starthistle to 0% density within 5 years. This will be evaluated through annual monitoring using the Invasive Plant Assessment Forms (Appendix C). Another measure of success will be the elimination of the JMC construction yard yellow starthistle infestation within 10 years.

For the Bishop Peak Natural Reserve, the objective is eradication of yellow starthistle within 5 years. This will be evaluated through annual monitoring using the Invasive Plant Assessment Forms (Appendix C).

For all un-infested Open Space Areas, prevention is key. Success will be measured by the absence of infestations found through annual monitoring.

J. RESOURCE NEEDS

Time and cost estimates will be inserted later upon consultation with the SLO City Natural Resource Manager, Robert Hill.

Permits Required: All herbicides sprayed should be done by a licensed and insured pesticide applicator. Reporting requirements exist through the California Department of Pesticide Regulation and are submitted through the local County Department of Agriculture. Other permits will be required if a controlled burn is pursued as a control strategy for yellow starthistle at the Stenner Springs Natural Reserve.

K. RESULTS OF EVALUATION

(This section is to be filled in later, preferably within 1 year, when monitoring data has been taken and evaluated, at least preliminarily. The evaluation should be used to determine whether any of the sections B-K above should be modified.)

Scientific name: *Carthamus lanatus* **Common name:** Woolly distaff thistle

Updated : June 31, 2015

A. PRIORITY High

B. DESCRIPTION

Woolly distaff thistle (*Carthamus lanatus*) is found in disturbed open sites, roadsides, agriculture fields, grassland/rangeland and pastures. It is an erect winter annual. Plants exist as rosettes until flower stems develop in spring/summer. Plants reproduce only by seed. Most seeds fall near the parent plant, however they can be dispersed long distances by animals, humans, machinery such as tractors and road grading equipment, mud and water. Most seeds germinate the first couple of years, but some can remain viable for up to 8 years under field conditions. Woolly distaff thistle is native to the Mediterranean region of Europe.

C. CURRENT DISTRIBUTION ON THE SITE

Woolly distaff thistle has a limited distribution on SLO City Open Space Areas (Map 12). It can be found on the Bishop Peak Natural Reserve, but has also been noted near the Irish Hills Natural Reserve at the gate near John Madonna Construction (JMC) yard. It is present in the land surrounding the City of San Luis Obispo, but would not be considered widespread.

D. DAMAGE & THREATS

Woolly distaff thistle is well armed and presents a real challenge to grazing animals in rangelands and passive recreational users. The plant is highly competitive and displaces desirable rangeland vegetation.

E. GOALS

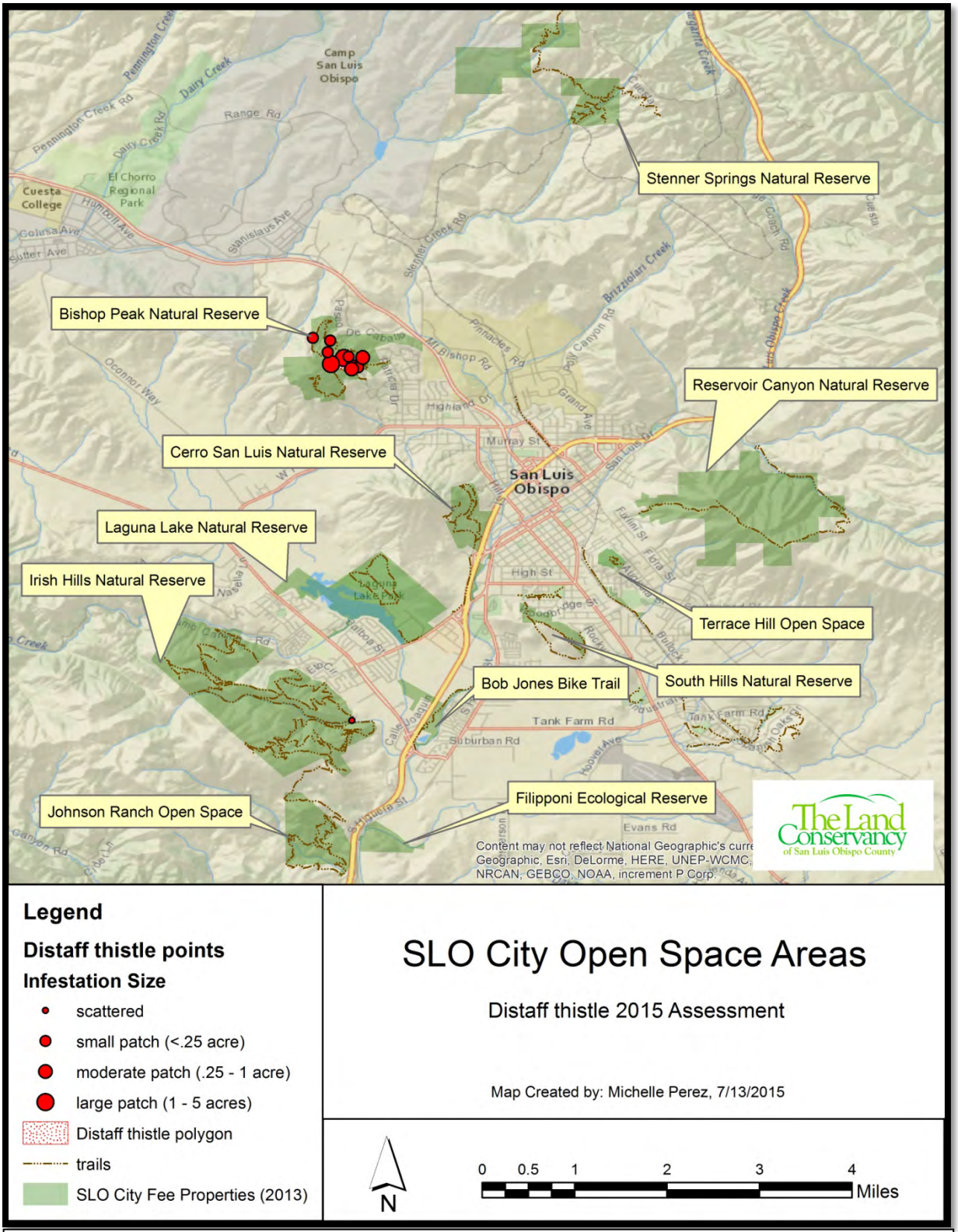
The 5 year goal is “elimination to zero density” on Bishop Peak Natural Reserve. The 11 year goal would be total eradication from the site.

The goal for the Irish Hills Natural Reserve is “eradication”. The goal for all other City Open Space Areas is “prevention”.

F. OBJECTIVES (Measurable)

Eliminate Woolly Distaff thistle to 0% density Bishops Peak Natural Reserve within 5 years. Total Eradication should be achieved within 11 years. Total eradication is judged by no new plants found for a period of 3 years.

Total Eradication from Irish Hills should be achieved within 5 years. Total eradication is judged by no new plants found for a period of 3 years.



Map 13. 2015 Invasive Plant Assessment showing woolly distaff thistle (*Carthamus lanatus*) distribution in SLO City Open Space Areas.

G. MANAGEMENT OPTIONS

Viable control options are:
(1) No treatment;

(2) (Biological); There are currently no biological control agents available for *Carthamus lanatus*.

(3) (Cultural); Heavy grazing increases distaff thistle populations because livestock selectively graze more palatable and less spiny species, reducing competition with other plants for light and nutrients.

(4) (Mechanical);
Hoeing – this is an effective control for small populations. The timing should occur before flowering. Plants must be cut below the soil surface to prevent resprouting.

Mowing – timing should be after bolting but before flower bud development. Plants mowed after flower heads develop can still produce viable seeds in cut heads.

(5) (Chemical); The use of herbicides should always follow the label. There are numerous herbicides that have been shown to be effective at controlling woolly distaff thistle.

GROWTH REGULATORS	
Aminopyralid *Milestone*	**Application type(s):** Broadcast; High-volume spray-to-wet spot treatment **Timing**: Preemergence or postemergence. Postemergence applications are most effective from seedling to the early-rosette stage (late winter or early spring). **Remarks:** Aminopyralid gives excellent control of woolly distaff thistle. It is safe on grasses, although can impact them at higher rates. Aminopyralid has a longer residual and higher activity than clopyralid. Other members of the Asteraceae and Fabaceae are very sensitive to aminopyralid.
Clopyralid *Transline*	**Application type(s):** Broadcast; High-volume spray-to-wet spot treatment **Timing**: Preemergence or postemergence. Postemergence applications should be applied from seedling to late rosette stage. **Remarks:** Clopyralid gives good control of woolly distaff thistle, but not as good as Aminopyralid. It is safe on grassess. Other members of the Asteraceae and Fabaceae can be sensitive to clopyralid. Clopyralid does not bind very tightly to soil and thus can leach into water easily. Once suspended in the water column, it will not breakdown until it falls out with the sediment.
Triclopyr *Garlon 3A, Garlon 4 Ultra*	**Application type(s):** Broadcast; High-volume spray-to-wet spot treatment **Timing**: Postemergence from seedling to small rosette stage. **Remarks:** Triclopyr has little to no residual activity. It is broadleaf-selective and typically does not harm grasses. *Garlon 4 Ultra* is formulated as an ester. In warm temperatures (>80^{o}F), there is arisk of volatilization and off-target damage.
AROMATIC AMINO ACID INHIBITORS	
Glyphosate *Roundup Pro Conc, Aquaneat, others*	**Application type(s):** Broadcast; High-volume spray-to-wet spot treatment **Timing:** Postemergence to plant from rosette to early bolting. **Remarks:** Glyphosate has no soil activity and is nonselective.

H. ACTIONS PLANNED (Treatments and monitoring)

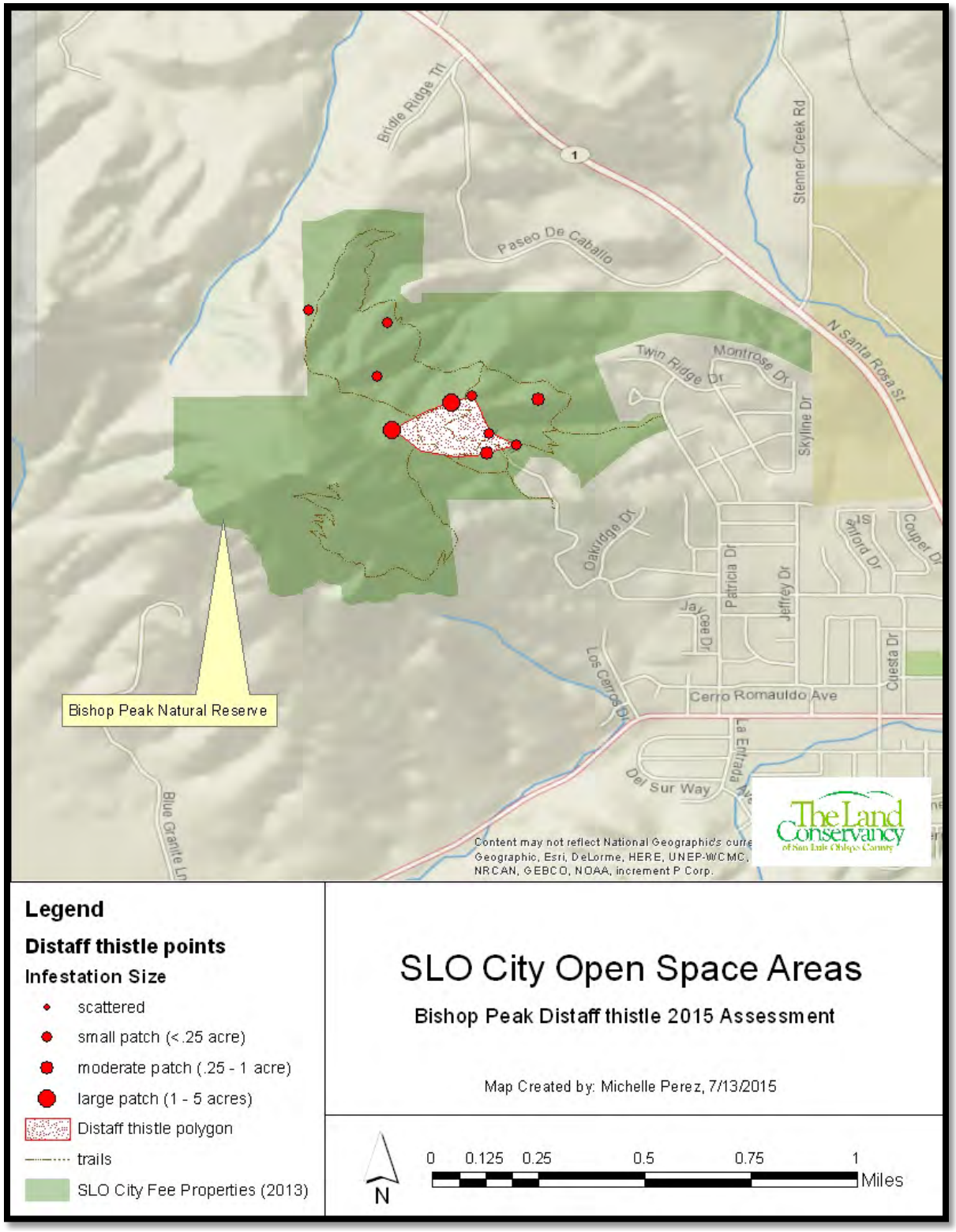
Actions for specific Open Space Areas –

Bishop Peak Natural Reserve: On the Bishop Peak Natural Reserve the largest population can be found near the Highland Drive entrance. This population covers approximately a 12 acre area. Outside of this core population there are 4 distinct satellite populations that can be found at various locations along the "Felsman's Loop" trail (Map 14). All of these populations are in grassland/rangeland areas or along fire roads and trails. Some control work has occurred in the past, but the treatments have been on an "opportunity" basis and have had minimal if any success. The size and distribution of this infestation lends it towards the *Category III Control Action:*

> *Present as large infestations in parts of SLO City Open Space Areas. Native plant communities are disrupted and native species displaced from infested areas. Remove outliers first. If possible, eliminate the exotic seed bank in outlier areas after mature plants have been removed to deter re-establishment. Map large infestations. Plan larger attack projects. Resources permitting, implement one or more large-scale projects, aimed as follows:*
>
> a. *Contain spread to within infested areas.*
> b. *Reduce the number and size of infestations, restore native species to bared sites, and follow a strategy that minimizes dispersal and re-infestation. In general, treat the smallest, furthest outlying areas first.*
> c. *Eliminate the larger infestations, moving from the fringes toward the source of seed dispersal.*

Access to the site is good, allowing for numerous management options. The overall strategy should target outlier populations first and then begin control on the perimeter of the larger population working towards the center. The preferred tool for this site, providing the best control with the least impact, would be a low-toxicity selective herbicide (aminopyralid or clopyralid) sprayed as a broadcast technique in heavily infested areas or high-volume spot spray in outlier populations. These herbicides are broad-leaf specific which allows the use of "competitive exclusion" as a control technique in grassland areas. There are healthy native grass communities in this area. It is anticipated that natural recruitment will help expand this grassland, but in certain areas, re-seeding with site appropriate native grasses may be desirable. After initial herbicide application, follow-up treatments should be done with either herbicide spot treatments or manual removal with a hoe, pulaski or McLeod.

Initial monitoring and site assessment should begin in March with initial herbicide applications happening in around April-May when the plant is in the seedling to early rosette stage. Follow up surveys should be performed at two week intervals after the initial treatment to inform the need for follow-up treatments. Treatments will go through late spring.

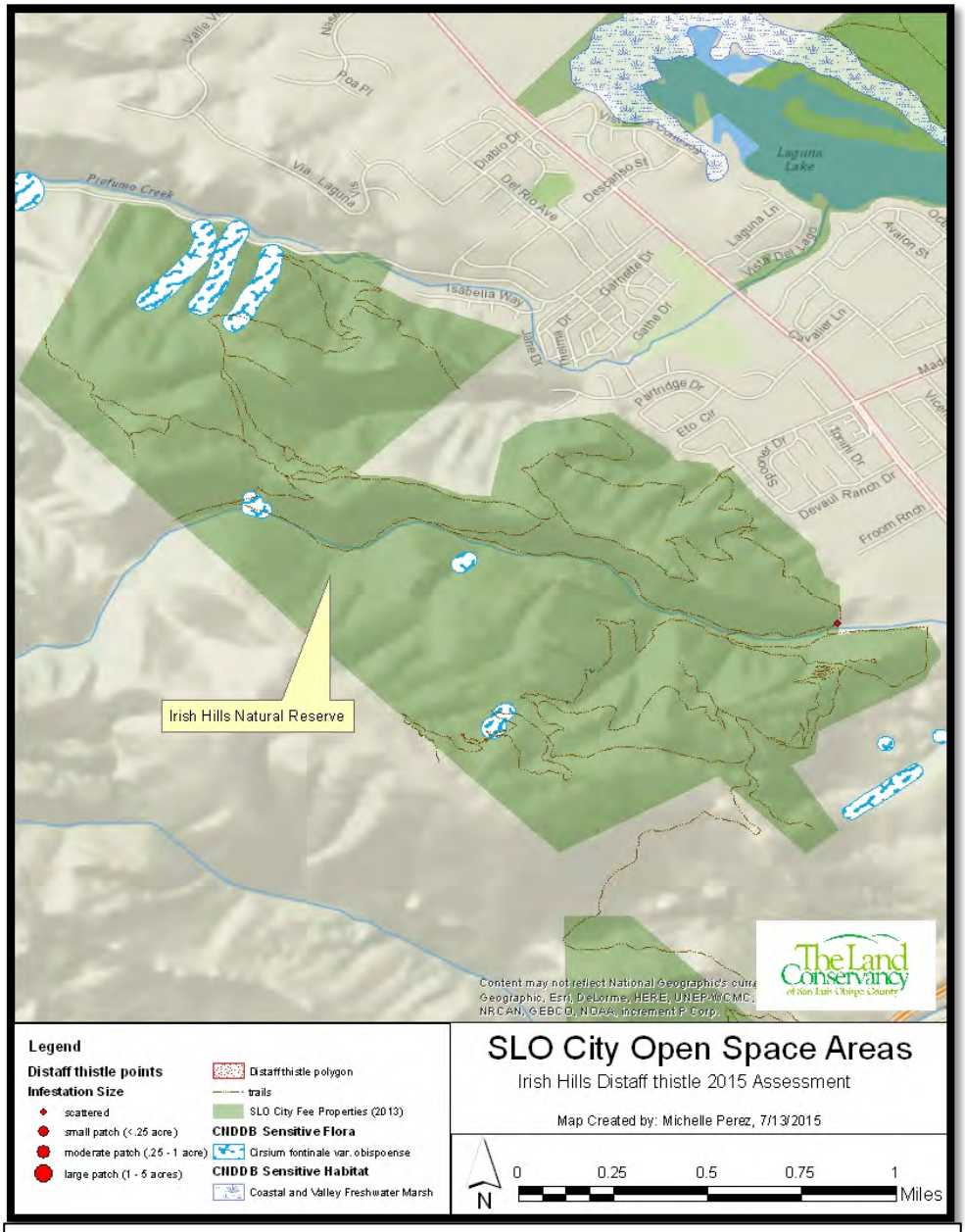


Map 14. Woolly distaff thistle (*Carthamus lanatus*) 2015 population assessment in Bishop Peak Natural Reserve.

Irish Hills Natural Reserve: The geographic distribution of woolly distaff thistle (*C. lanatus*) is currently restricted to the perimeter near the John Madonna Construction yard (Map 15). Due to the limited size and geographic distribution of this species, a *Category II Management Action* is being implemented:

Present in SLO City Open Space Areas as individuals or small, localized populations. Remove by hand or other precision control technique, and maintain a record of actions. Monitor the removal sites, following up with additional removal as needed. This kind of diligence keeps control costs low.

Currently this population is being monitored and removed by SLO City Rangers. Additional surveys will be done to determine if these were isolated incidents, or if a larger seed source is nearby. Surveys should be conducted in July when plants have bolted and are easiest to find.



Map 15. Woolly distaff thistle (*Carthamus lanatus*) 2015 population assessment in Irish Hills Natural Reserve overlaid with locations of the federally and state listed Chorro Creek Bog Thistle (*Cirsium fontinale* var. obispoense).

I. HOW ACTIONS WILL BE EVALUATED (Criteria for success)

For the Bishop Peak Natural Reserve, success will be determined by a reduction of 95% of 2015 levels within 5 years and a 100% reduction within 11 years. This will be evaluated through both before and after photos, detailed GIS mapping and annual monitoring using the Invasive Plant Assessment Forms (Appendix C). Success is determined by total eradication by year 11. Total eradication means a constant zero population density over a three year period of monitoring.

For the Irish Hills Natural Reserve, the objective is elimination of woolly distaff thistle to 0% density within 5 years. This will be evaluated through annual monitoring using the Invasive Plant Assessment Forms (Appendix C).

For all un-infested Open Space Areas, prevention is key. Success will be measured by the absence of infestations found through annual monitoring.

J. RESOURCE NEEDS

Time and cost estimates will be inserted later upon consultation with the SLO City Natural Resource Manager, Robert Hill.

Permits Required: All herbicides sprayed should be done by a licensed and insured pesticide applicator. Reporting requirements exist through the California Department of Pesticide Regulation and are submitted through the local County Department of Agriculture.

K. RESULTS OF EVALUATION

(This section is to be filled in later, preferably within 1 year, when monitoring data has been taken and evaluated, at least preliminarily. The evaluation should be used to determine whether any of the sections B-K above should be modified.)

Scientific name: *Tamarix sp.* **Common name:** Saltcedar, Tamarisk

Updated : June 31, 2015

A. PRIORITY High

B. DESCRIPTION

Tamarisk can occupy rivers, lake and pond margins, washes, roadsides, ditches, and springs. It grows best in alkaline soil, but tolerates salinity and acidity. Plants grow as small trees or shrubs. They develop deep root systems to about 15 ft. and have a high evapotranspiration rate. Reproduction is predominantly by seed, but can also reproduce vegetatively from root sprouts and stem fragments. Seeds disperse by both wind and water. Seeds lack a dormancy period and most germinate within 24 hours after contacting water. Seeds typically survive for only 5 weeks. Tamarisk is native to eastern Asia, northern Africa, the Middle East, India, and southern Europe.

C. CURRENT DISTRIBUTION ON THE SITE

Tamarisk is currently invading the Laguna Lake Natural Reserve. It is presumed that the source population originates on private property off of Foothill Blvd (Map 16).

D. DAMAGE & THREATS

Tamarisk plants can use both surface and groundwater. The presence of numerous trees along riparian areas have been known to seriously reduce ground water tables and surface water availability, drying up wetlands, and reducing flows. Roots extract salts from deep soil layers and excrete it from leaves. Salt is deposited on the soil surface with the leaf litter. The increased salinity of the upper soil profile inhibits the growth, survival, and recruitment of desirable native vegetation.

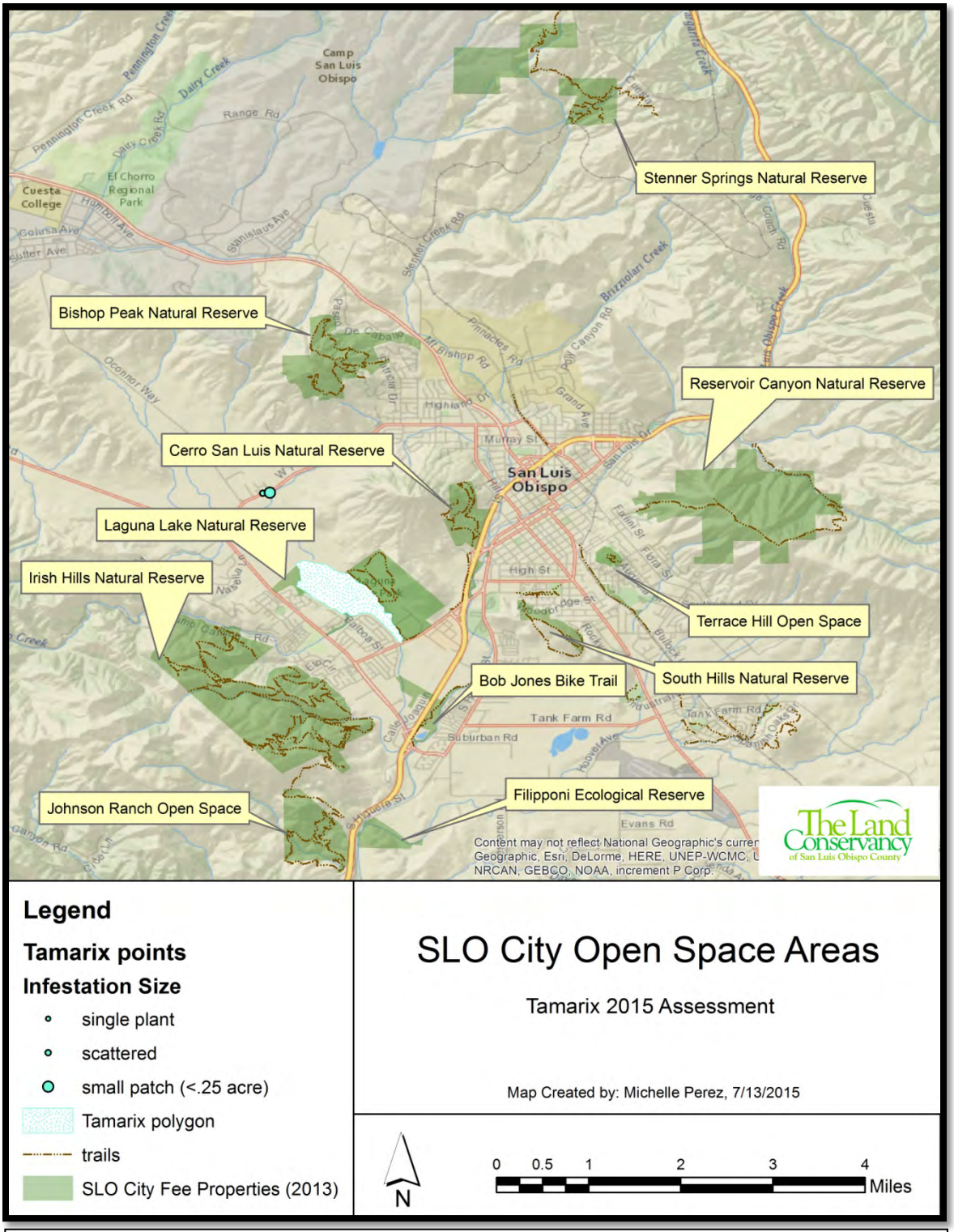
E. GOALS

The long-term goal for this species is complete eradication from SLO City Open Space Areas. Due to its limited distribution in the San Luis Obispo Area and its short lived seed bank, eradication is an achievable and appropriate goal.

F. OBJECTIVES (Measurable)

Eliminate Tamarisk to 0% density at the Laguna Lake Natural Reserve within 5 years.

Eliminate seed source population of Tamarisk within 5 yrs. Once access is obtained to remove source populations, the management object can move to eradication in 10 years.



Map 16. 2015 Invasive Plant Assessment showing *Tamarix sp.* distribution in SLO City Open Space Areas.

G. MANAGEMENT OPTIONS

Viable control options are:

(1) No treatment;

(2) (Biological); A new biotype of saltcedar leaf beetle (*Diorhabda elongate*) has been released in California and is establishing well. Biological control will not eradicate tamarisk but it has the potential to suppress populations by 75 to 85%. It is doubtful this would be an effective tool in San Luis Obispo because there is not enough tamarisk to support a *Diorhabda* population.

(3) (Cultural);

Burning – As a stand-alone strategy burning has not been successful. To be successful, prescribed fires should be followed by herbicide application to control resprouts.

Flooding – Young seedlings of tamarisk can be controlled by flooding for 1 month.

(4) (Mechanical); Mechanical control methods include mowing, chopping, chaining, and disking. However, these methods usually only suppress tamarisk temporarily and will not eradicate infestations. Tamarisk is also able to resprout vigorously from the root crown following mechanical control methods. Any fragments that move into the water column can resprout. Hand pulling can be effective on small plants when the roots can be removed as well.

(5) (Chemical); The use of herbicides should always follow the label. There are numerous herbicides that have been shown to be effective at controlling tamarisk.

GROWTH REGULATORS	
Triclopyr *Garlon 3A, Garlon 4 Ultra, Pathfinder II*	**Application type(s):** Cut stump treatment: Basal bark treatment on young trees without well-developed bark. **Timing**: Summer or Fall when plants are still growing but not water stressed. At this time herbicide will translocate to the roots. **Remarks:** Cut stump treatments can be very effective. Basal bark treatment is only effective on young trees without well-developed bark.
AROMATIC AMINO ACID INHIBITORS	
Glyphosate *Roundup Pro Conc, Aquaneat, others*	**Application type(s):** Broadcast foliar treatment: Cut stump treatment: **Timing:** Broadcast treatments should be made in late summer or early fall when plants are translocating carbohydrates to the below-ground tissues. Cut stump treatments can be made year-round but avoid treatment under drought conditions.. **Remarks:** Glyphosate provides only partial control of *Tamarix* species. Because the herbicide precipitates out when in contact with divalent and trivalent salts, the salty excretions on the foliar glands will reduce the effectiveness of glyphosate. Foliar treatment with glyphosate will probably be most effective if applied shortly after a rainfall event.
BRANCHED-CHAIN AMINO ACID INHIBITORS	
Imazapyr *Habitat, Polaris*	**Application type(s):** Broadcast foliar treatment: Spot treatment high volume spray-to-wet: Spot treatment low volume: Cut stump treatment: Hack-and-squirt treatment **Timing:** Late summer or early fall when plants are fully expanded and are translocating carbohydrates to the below-ground tissues. **Remarks:** Imazapyr is the most widely used herbicide to control tamarisk. It is approved for use in aquatic environments. Both broadcast and low volume treatments give excellent control. This herbicide is fairly non-selective, so off target damage should be considered. Imazapyr takes a long time to kill the plant. Plants should not be removed for at least 2 years to ensure good control.

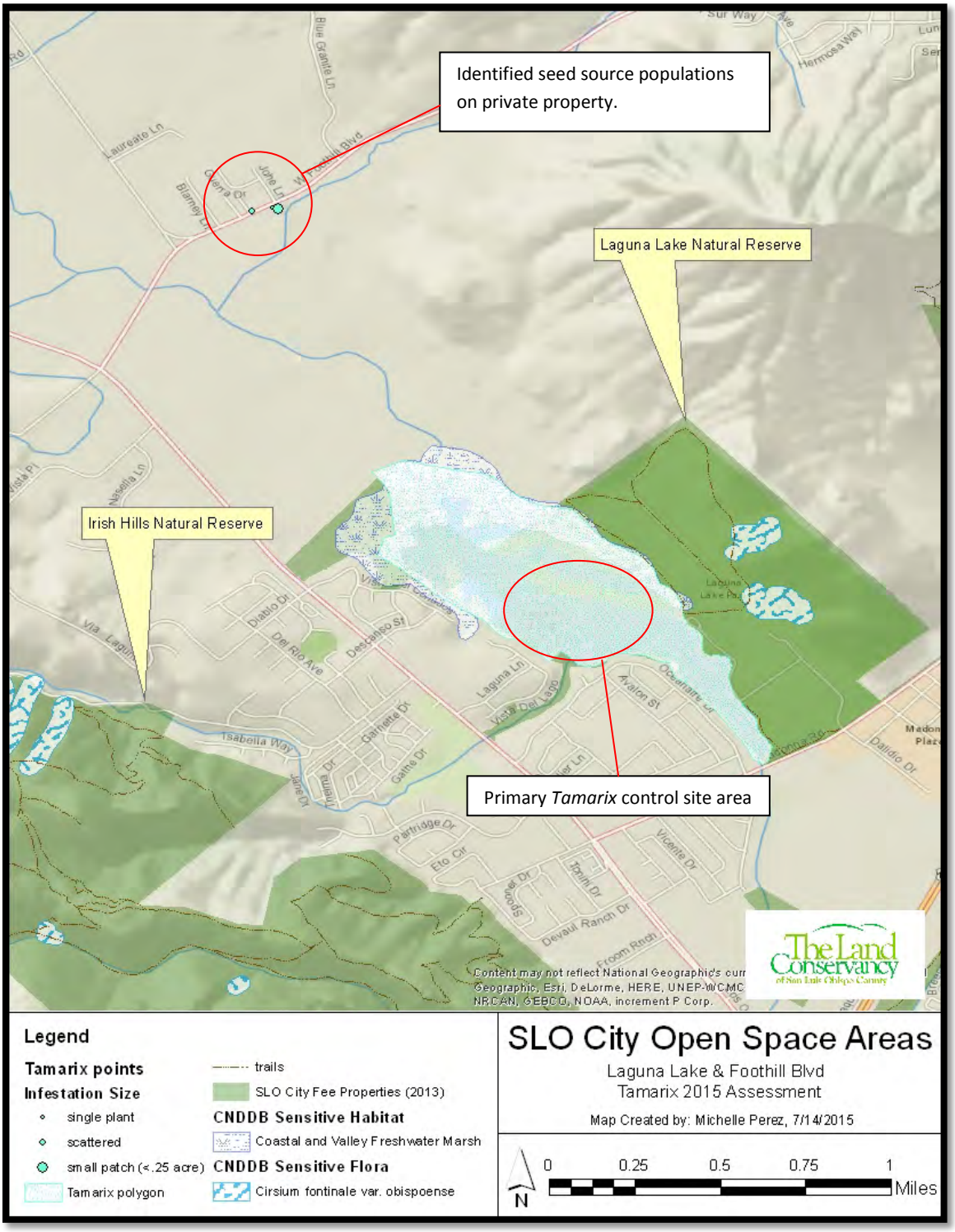
H. ACTIONS PLANNED (Treatments and monitoring)

Laguna Lake Natural Reserve: Presently, tamarisk is restricted to the Laguna Lake Natural Reserve and surrounding drainages (Map 17). As water levels have continued to recede in recent years, there has been an increase in the infestation of Tamarisk on the newly exposed mudflats and lake margins. The densest part of the infestation has been centered in an area best described as the Prefumo "delta", where Prefumo creek drains into Laguna Lake depositing sand and silt in an alluvial fan. It is suspected that the actual species is *Tamarix ramossisima*, although there is currently no vouchered specimen. In 2014 SLO City's Natural Resources Program took a lead role in coordination of the City's efforts to undertake an "early detection, rapid response" approach to this species before it spreads throughout the lake area. About 925 plants were removed in Fall 2014 with another 327 plants removed during spring and summer of 2015. Monitoring and removal occurs bi-monthly. Plants are removed by hand using the sharp point of a pick mattock to loosen the soil around the tree and pull, removing with the tap root intact.

This monitoring and hand removal effort in the lake area will continue through efforts of the SLO City Natural Resources Program, SLO City Ranger's with help from volunteers and groups like the Watershed Stewards Program and California Conservation Corps.

Additional work needs to be done to remove the source population(s) off of Foothill Blvd. First steps, which are currently underway, will gain access and buy-in for the project with the various private property owners involved. Additional support may be provided through the SLO County Weed Management Area and SLO County Department of Agriculture. Although this population is geographically small, the plants appear to be well established. Because the bark on the trees is developed enough to preclude basal bark treatments as an option, it is recommended that a cut-stump approach be taken. Trees removed from the cut-stump approach should be either chipped on-site or removed and chipped elsewhere. Either Triclopyr or Imazapyr would be good options for this. Timing should occur in the Fall with follow-up monitoring happening in Spring. It should be noted that the herbicide Imazapyr takes a long time to work and may damage nearby trees if the roots are grafted to the Tamarisk plants. It would also be beneficial to survey the Prefumo creek watershed for additional seed sources.

Photo 2. Saltcedar removed from Laguna Lake, Sept. 14, 2014



Map 17. *Tamarix sp.* distribution in the Laguna Lake Natural Reserve overlaid on sensitive habitat types identified by the California Natural Diversity Database (CNDDB).

I. HOW ACTIONS WILL BE EVALUATED (Criteria for success)

For the Laguna Lake Natural Reserve, the objective is elimination of *Tamarix sp.* to 0% density within 5 years. This will be evaluated through annual monitoring using the Invasive Plant Assessment Forms (Appendix C). Evaluation for eradication will not be possible until the source population has been eliminated.

For the source population on Foothill Blvd. the goal is eradication. Because of the short-lived seed bank this is possible within a 5 year time-frame. This will be evaluated through annual monitoring using the Invasive Plant Assessment Forms (Appendix C). Eradication is determined by three years of monitoring revealing no new *Tamarix sp.* detected.

J. RESOURCE NEEDS

Time and cost estimates will be inserted later upon consultation with the SLO City Natural Resource Manager, Robert Hill.

Permits Required: All herbicides sprayed should be done by a licensed and insured pesticide applicator. Reporting requirements exist through the California Department of Pesticide Regulation and are submitted through the local County Department of Agriculture.

State Water Resources Control Board National Pollution Elimination System (NPDES) Pesticide Permit for Weed Control - The State Water Resources Control Board adopted the Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications, Water Quality Order 2013-0002-DWQ, for the reissuance of General NPDES Permit CAG990005 in June 2013. Order 2013-0002-DWQ became effective on December 1, 2013.

This General Permit covers the point source discharge to waters of the United States of residues resulting from pesticide applications using products containing 2,4-D, acrolein, copper, diquat, endothall, fluridone, glyphosate, imazamox, imazapyr, penoxsulam, sodium carbonate peroxyhydrate, and triclopyr-based algaecides and aquatic herbicides, and adjuvants containing ingredients represented by the surrogate nonylphenol.

It is possible this permit would be needed for control of *Tamarix sp.* in Laguna Lake or the drainages containing the source populations if applications are made when there is water in the creek/drainage or lake and there will be a point source discharge to the water column through direct application or drift. If this permit is needed, a corresponding “Aquatic Pesticide Application Plan” or APAP must be prepared. Yearly fees are also associated with this permit. A cut-stump technique of herbicide application would eliminate the chance for drift into the water column.

K. RESULTS OF EVALUATION

(This section is to be filled in later, preferably within 1 year, when monitoring data has been taken and evaluated, at least preliminarily. The evaluation should be used to determine whether any of the sections B-K above should be modified.)

Scientific name: *Genista monspessulana* **Common name:** French broom

Updated : June 31, 2015

A. PRIORITY High

B. DESCRIPTION

French broom invades grasslands, coastal scrub and chaparral, oak woodlands, forest margins, riparian corridors and disturbed sites. It is a perennial evergreen shrub tolerating varied soil moisture regimes. Reproduction is by seed. Seeds can remain viable in the soil for up to 30 years. Large soil seedbanks often accumulate making long term control difficult. Seeds get spread when seed pods dehisce propelling seeds several feet from the parent plant. French broom is native to the Mediterranean region of Europe and was introduced as a horticultural plant.

C. CURRENT DISTRIBUTION ON THE SITE

French Broom can be found throughout SLO City Open Space Areas, but it is not yet widespread. Invasions are typically expanding from neighboring properties. It is expanding in the Irish Hills Natural Reserve, Cerro San Luis Natural Reserve, Reservoir Canyon Natural Reserve, Terrace Hill Open Space and the South Hills Natural Reserve (Map 18).

D. DAMAGE & THREATS

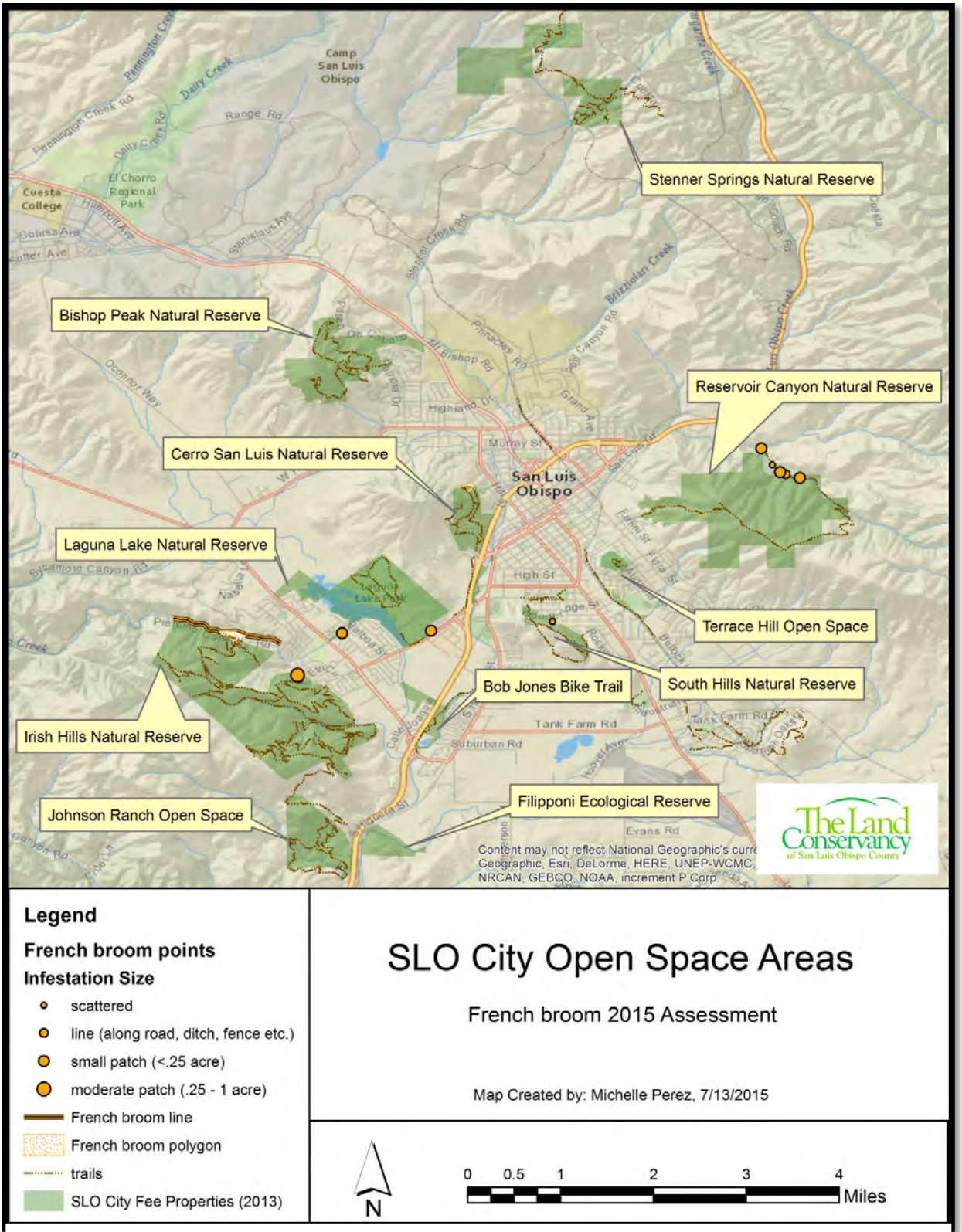
French broom grows rapidly and can form dense impenetrable thickets. The dense growth habit outcompetes native vegetation, can exclude larger wildlife and is extremely flammable. French broom is thought to have fueled the devastating 1991 Oakland Berkeley Hills Fire. French broom has the ability to fix atmospheric nitrogen into soil. This aids in its own colonization of marginal soils and also benefits other weedy species. This can be a particular problem for the regions serpentine soil communities. These communities are unique and fairly resistant to invasion because they are low fertility. An invasion of French broom to these areas could convert these ecosystems from a native grass dominated ecosystem to a shrub dominated one.

E. GOALS

The long-term goal for this species is to contain its spread through outlier and perimeter control.

F. OBJECTIVES (Measurable)

Reduce *G. monspessulana* infestations on Terrace Hills Natural Reserve to a zero (0) % density within 5 years. For all other infested SLO City Open Space Areas, maintain a 100 ft. buffer zone around 2015 infestation levels with only a 5% or less cover in the buffer zones.



Map 18. 2015 Invasive Plant Assessment showing *Genista monspessulana* distribution in SLO City Open Space Areas.

Viable control options are:

(1) No treatment;

(2) (Biological); The native pyralid moth (*Uresiphita reversalis*) defoliates some French broom, but plants grow new leaves after the larvae metamorphose. Larvae of this moth have been observed at the South Hills Natural Reserve (Photo 3).

Photo 3. *Uresiphita reversalis* moth on French broom.

(3) (Cultural);
Grazing - Goats confined to a small area can help control stands that re-sprout after cutting or burning.

Burning – burning can remove above ground biomass, release nutrients into the soil, and cause a flush of seed germination from the seedbank. Alone, it is not an effective treatment, but can be used to reduce the seedbank if followed up with herbicide applications and/or revegetation with desirable species. It is important to employ a control strategy following a burn; otherwise the broom population in subsequent years may become worse than before.

Flaming – good success has been seen on seedlings using a propane torch to wilt the leaves and rupture the cells. Due to the fire danger, this is best done during a rain.

(4) (Mechanical); Hand pulling can be done on small seedlings, but for larger plants a weed extraction tool such as a “weed wrench” must be employed. This has proven effective and is a suitable control strategy for use by volunteers. Cutting plants in the Spring can reduce flowering and repeated cutting can deplete the plant’s energy reserves, but resprouts will occur and must be sprayed with herbicide.

(5) (Chemical); The use of herbicides should always follow the label. There are numerous herbicides that have been shown to be effective at controlling French broom.

GROWTH REGULATORS	
Triclopyr *Garlon 3A, Garlon 4 Ultra, Pathfinder II* Aminopyralid + triclopyr *Capstone, Milestone Vm Plus*	**Application type(s):** High-volume spray-to-wet spot treatment; Low volume treatment: Cut stump treatment: Basal bark treatment: **Timing**: Postemergence when plants are growing rapidly. Cut stump and basal bark treatments can be applied anytime although are optimal if not applied when sap is rising in early spring. **Remarks:** Triclopyr is a selective herbicide for broadleaf species. Plants treated with basal bark technique should not be cut for at least 1 month following application.
AROMATIC AMINO ACID INHIBITORS	
Glyphosate *Roundup, Rodeo, Aquaneat, others*	**Application type(s):** High-volume spray-to-wet spot treatment; Low volume treatment: Cut stump treatment: **Timing:** Postemergence when plants are growing rapidly. Treatments should be made in late summer or early fall. **Remarks:** Glyphosate is a nonselective herbicide. It gives good control with some resprouts. Treated plants should not be cut for at least 4 months after foliar treatment.
BRANCHED-CHAIN AMINO ACID INHIBITORS	
Imazapyr *Habitat, Polaris*	**Application type(s):** Cut stump treatment: **Timing:** Best when applied in late summer to early fall, but before leaf drop. **Remarks:** Imazapyr is a soil residual herbicide and may result in bare ground around trees for some time after treatment.

H. ACTIONS PLANNED (Treatments and monitoring)

Actions for specific Open Space Areas –

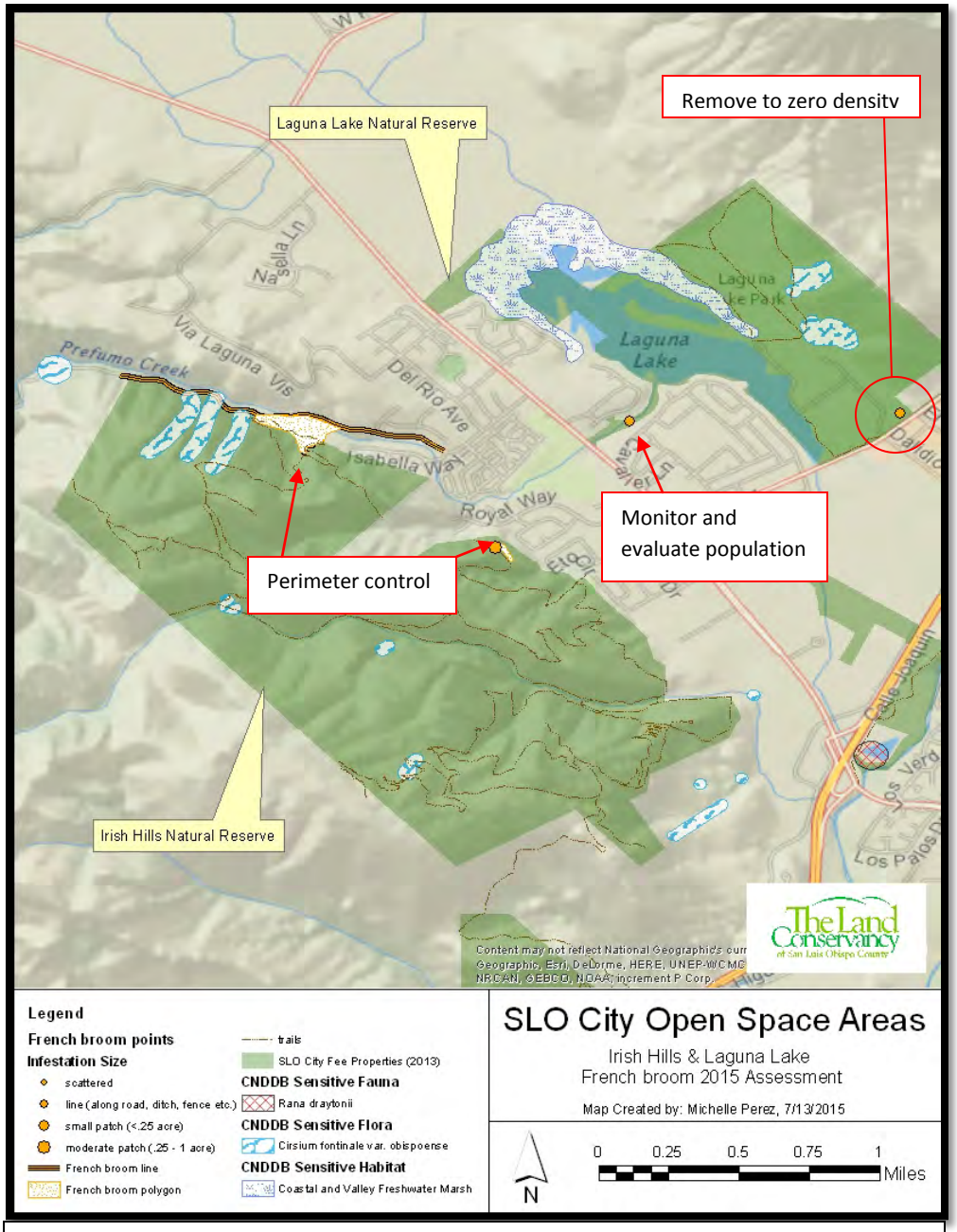
Irish Hills Natural Reserve: At the Irish Hills Natural Reserve French broom is spreading predominantly down Prefumo creek and migrating to upland areas from there (Map 19). Although, by no means widespread at the Irish Hills, there is a clear outward migration of French broom onto the Reserve from neighboring properties. It is expected that infestation could greatly expand throughout the Irish Hills Natural Reserve. Currently there is no management for French broom in Prefumo Canyon or on neighboring properties. The size and distribution of this infestation lends it towards the *Category III Control Action:*

Present as large infestations in parts of SLO City Open Space Areas. Native plant communities are disrupted and native species displaced from infested areas. Remove outliers first. If possible, eliminate the exotic seed bank in outlier areas after mature plants have been removed to deter re-establishment. Map large infestations. Plan larger attack projects. Resources permitting, implement one or more large-scale projects, aimed as follows:

a. *Contain spread to within infested areas.*
b. *Reduce the number and size of infestations, restore native species to bared sites, and follow a strategy that minimizes dispersal and re-infestation. In general, treat the smallest, furthest outlying areas first.*

c. Eliminate the larger infestations, moving from the fringes toward the source of seed dispersal.

A 100 foot buffer should be delineated along the perimeter of the existing infestation as a target zone for management. Surrounding areas should be searched for satellite population which would be mapped and removed immediately. The buffer zone should be managed to allow no more than 5% cover of French broom. Removal by volunteers using a weed extraction tool such as the "weed wrench" can be used to good effect to minimize the spread. Herbicide application using a basal bark technique, cut-stump or a low volume high concentration "drizzle" technique can be employed for larger or well established populations not possible with hand removal. Due to the longevity of the seed bank, any control actions taken will need consistent follow-up for up to 30 years.



Map 19. French broom (*Genista monspessulana*) 2015 population assessment in Irish Hills Natural Reserve and Laguna Lake Natural Reserve overlaid with locations of the federally and state listed Chorro Creek Bog Thistle (*Cirsium fontinale* var. obispoense).

Laguna Lake Natural Reserve: The geographic distribution of French broom (*G. monspessulana*) is currently restricted to the perimeter near the Madonna Road entrance and populations migrating down Prefumo creek (Map 19). Due to the limited size and geographic distribution of this species, a *Category II Management Action* is recommended:

> *Present in SLO City Open Space Areas as individuals or small, localized populations. Remove by hand or other precision control technique, and maintain a record of actions. Monitor the removal sites, following up with additional removal as needed. This kind of diligence keeps control costs low.*

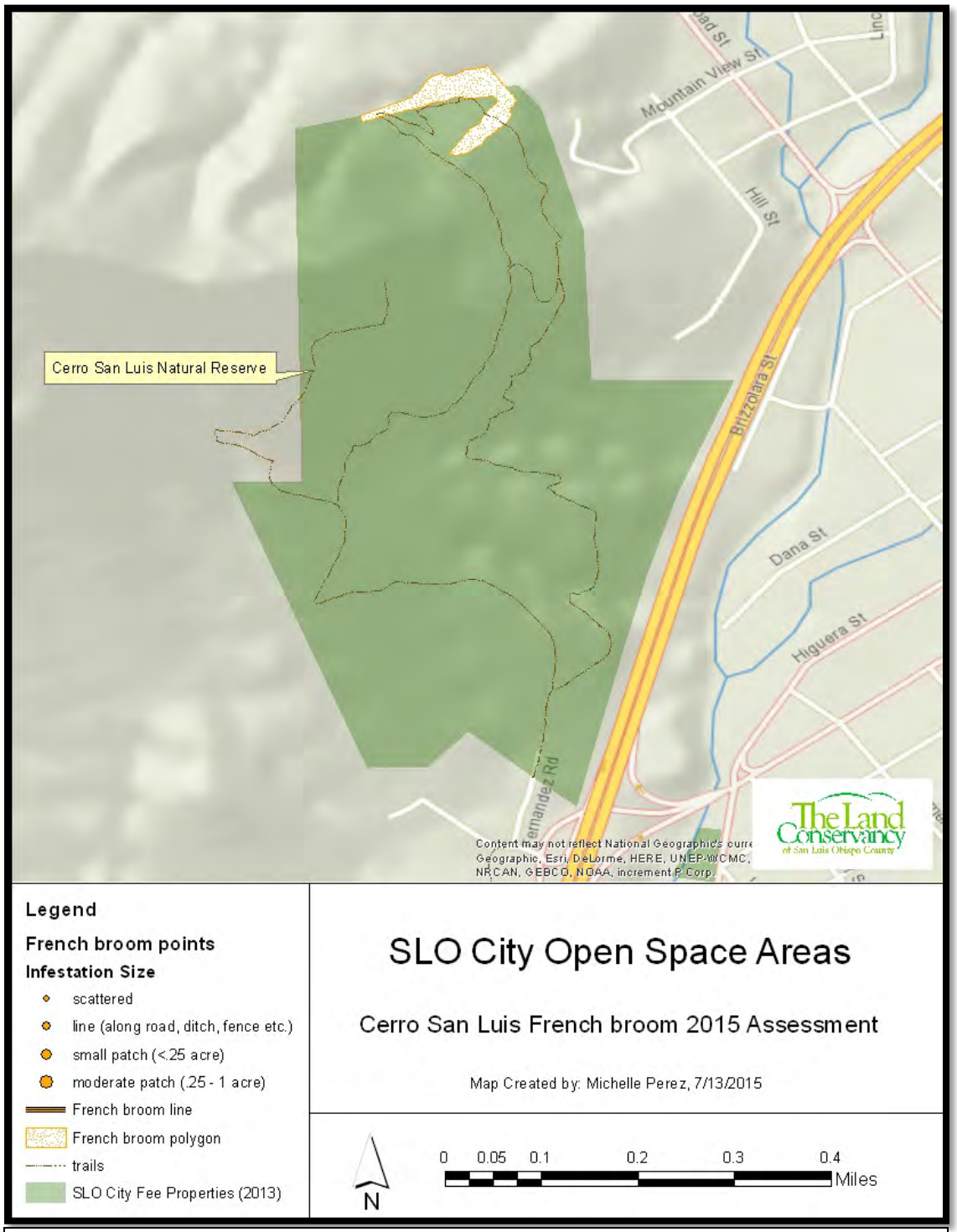
The population near Madonna Road should be controlled to zero density and monitored yearly after that for new plants emerging from the seed bank. Control can be by hand removal or with herbicide in a basal bark, cut-stump or drizzle technique. The population in Prefumo creek should be monitored and the spread assessed yearly to determine if management is necessary. Because there is such a large seed source in Prefumo creek, it is anticipated that there will always be some level of infestation in this part of the Laguna Lake Natural Reserve.

Cerro San Luis Natural Reserve: At the Cerro San Luis Natural Reserve French broom appears to be spreading from the neighboring urban areas. This could possibly be a garden escape from someone's yard. This population is migrating to upland areas near the Hill Street entrance (Map 20). French broom is not geographically widespread in this area, but is spreading rapidly up the more mesic habitats. The infestation has the potential to greatly expand throughout the Cerro San Luis Natural Reserve. The size and distribution of this infestation lends it towards the *Category III Control Action:*

> *Present as large infestations in parts of SLO City Open Space Areas. Native plant communities are disrupted and native species displaced from infested areas. Remove outliers first. If possible, eliminate the exotic seed bank in outlier areas after mature plants have been removed to deter re-establishment. Map large infestations. Plan larger attack projects. Resources permitting, implement one or more large-scale projects, aimed as follows:*
>
> a. *Contain spread to within infested areas.*
> b. *Reduce the number and size of infestations, restore native species to bared sites, and follow a strategy that minimizes dispersal and re-infestation. In general, treat the smallest, furthest outlying areas first.*
> c. *Eliminate the larger infestations, moving from the fringes toward the source of seed dispersal.*

A 100 foot buffer should be delineated along the perimeter of the existing infestation as a target zone for management. Surrounding areas should be searched for satellite population which would be mapped and removed immediately. The buffer zone should be managed to allow no more than 5% cover of French broom. Removal by volunteers using a weed extraction tool such as the "weed wrench" can be used to good effect to minimize the spread. Herbicide application using a basal bark technique, cut-stump or a low volume high concentration "drizzle" technique can be employed for larger or well

established populations not possible with hand removal. Due to the longevity of the seed bank, any control actions taken will need consistent follow-up for up to 30 years.

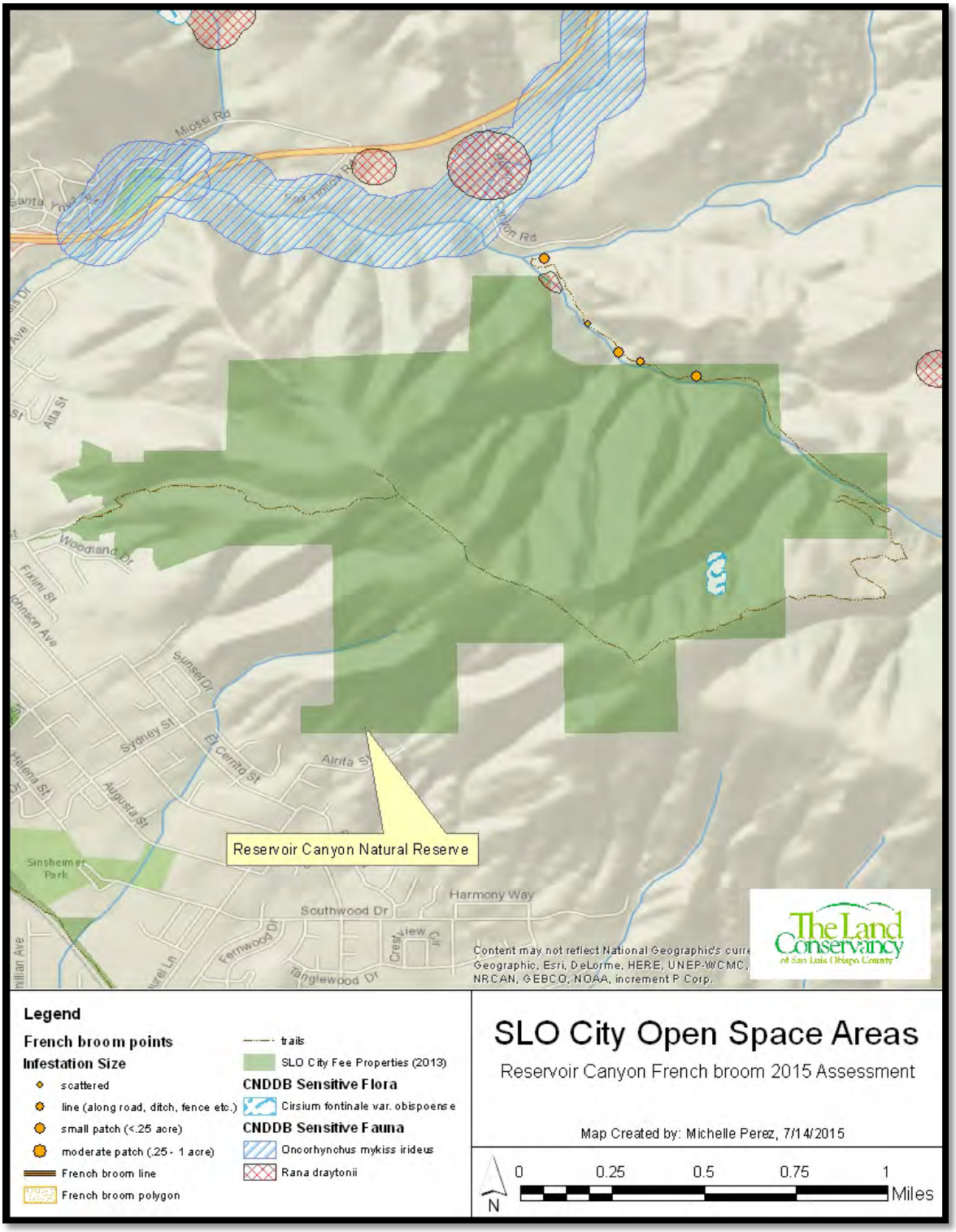


Map 20. French broom (*Genista monspessulana*) 2015 population assessment in Cerro San Luis Natural Reserve.

Reservoir Canyon Natural Reserve: At the Reservoir Canyon Natural Reserve French broom is spreading from the neighboring properties near the Reservoir Canyon Road trailhead. This population is migrating up the habitat surrounding Reservoir Canyon Creek at the North West boundary of the Reserve (Map 21). French broom is widespread at the Reservoir Canyon Road trailhead, but the population becomes more sparse as you head up the Canyon. This infestation has the potential to greatly expand throughout the Reservoir Canyon Natural Reserve. The size and distribution of this infestation lends it towards the *Category III Control Action:*

> *Present as large infestations in parts of SLO City Open Space Areas. Native plant communities are disrupted and native species displaced from infested areas. Remove outliers first. If possible, eliminate the exotic seed bank in outlier areas after mature plants have been removed to deter re-establishment. Map large infestations. Plan larger attack projects. Resources permitting, implement one or more large-scale projects, aimed as follows:*
>
> a. *Contain spread to within infested areas.*
> b. *Reduce the number and size of infestations, restore native species to bared sites, and follow a strategy that minimizes dispersal and re-infestation. In general, treat the smallest, furthest outlying areas first.*
> c. *Eliminate the larger infestations, moving from the fringes toward the source of seed dispersal.*

A 100 foot buffer should be delineated along the perimeter of the existing infestation as a target zone for management. Surrounding areas should be searched for satellite population which would be mapped and removed immediately. The buffer zone should be managed to allow no more than 5% cover of French broom. Removal by volunteers using a weed extraction tool such as the “weed wrench” can be used to good effect to minimize the spread. Herbicide application using a basal bark technique, cut-stump or a low volume high concentration “drizzle” technique can be employed for larger or well established populations not possible with hand removal. Due to the longevity of the seed bank, any control actions taken will need consistent follow-up for up to 30 years.



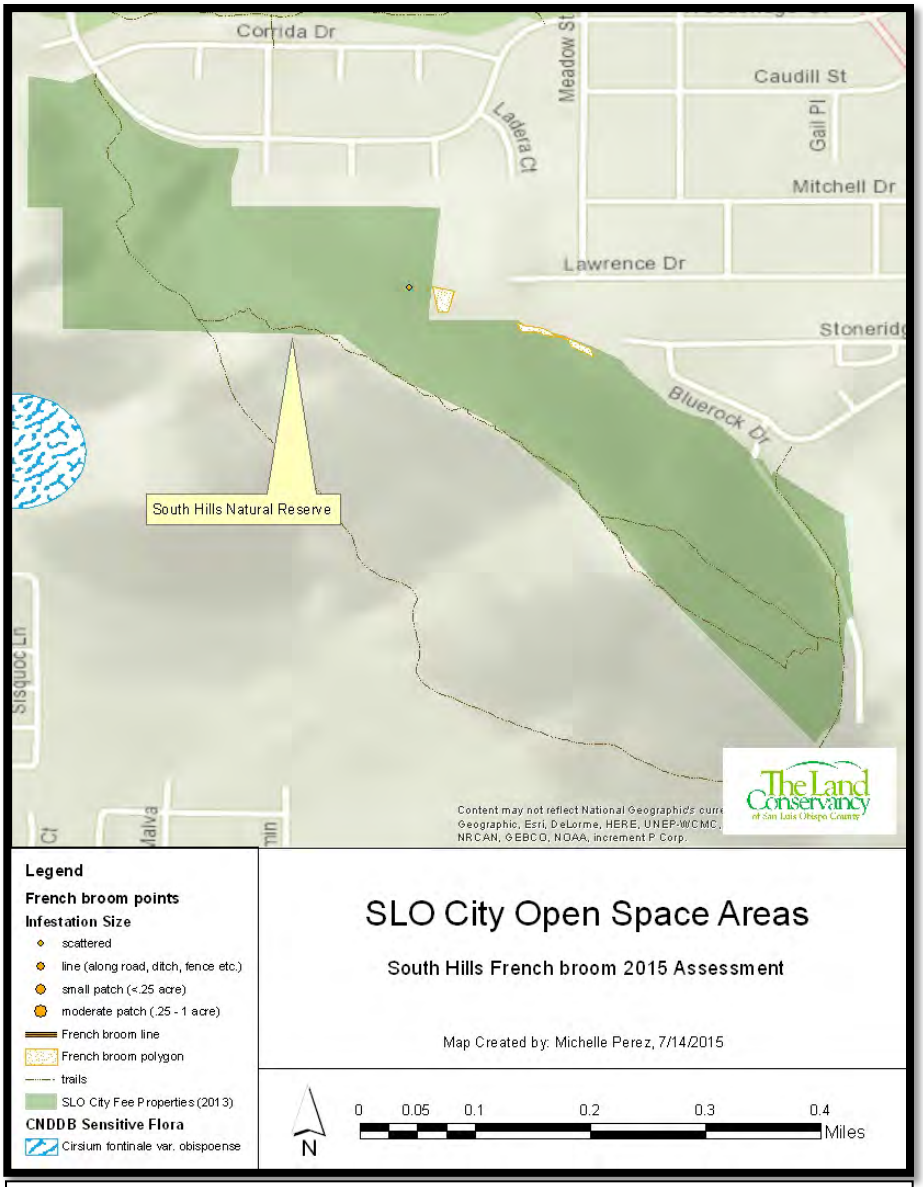
Map 21. French broom (*Genista monspessulana*) 2015 population assessment in Reservoir Canyon Natural Reserve overlaid with State and Federally listed Threatened and Endangered Species locations provided by the California Natural Diversity Database (CNDDB).

South Hills Natural Reserve: At the South Hills Natural Reserve French broom is spreading from the neighboring urban area. This is a garden escape from someone's yard (Picture 4). This population is migrating into the neighboring serpentine grassland habitats (Map 22). French broom is not geographically small and isolated enough that it could qualify as an eradication target, but because the populations directly adjoining the South Hills Natural Reserve are so well established, it is more appropriate to designate it a *Category III Control Action:*

> *Present as large infestations in parts of SLO City Open Space Areas. Native plant communities are disrupted and native species displaced from infested areas. Remove outliers first. If possible, eliminate the exotic seed bank in outlier areas after mature plants have been removed to deter re-establishment. Map large infestations. Plan larger attack projects. Resources permitting, implement one or more large-scale projects, aimed as follows:*
>
> a. *Contain spread to within infested areas.*
> b. *Reduce the number and size of infestations, restore native species to bared sites, and follow a strategy that minimizes dispersal and re-infestation. In general, treat the smallest, furthest outlying areas first.*
> c. *Eliminate the larger infestations, moving from the fringes toward the source of seed dispersal.*

All French broom on the South Hills Natural Reserve should be eliminated to a zero density and subsequently monitored annually to eliminate spread onto the Reserve. Further work should be done to coordinate with neighboring landowners to remove the seed source. Total eradication form this area will prove difficult due to longevity of the established seedbank. Removal by volunteers using a weed extraction tool such as the "weed wrench" can be used to good effect to minimize the spread. Herbicide application using a basal bark technique, cut-stump or a low volume high concentration "drizzle" technique can be employed for larger or well established populations not possible with hand removal. Due to the longevity of the seed bank, any control actions taken will need consistent follow-up for up to 30 years.

Photo 4. This picture shows *G. monspessulana* expanding onto the South Hills Natural Reserve from a neighboring landscape.



Map 22. French broom (*Genista monspessulana*) 2015 population assessment in South Hills Natural Reserve.

I. HOW ACTIONS WILL BE EVALUATED (Criteria for success)

For the South Hills Natural Reserve and Laguna Lake Natural Reserve, the objective is elimination of *G. monspessulana* to 0% density within 5 years. This will be evaluated through annual monitoring using the Invasive Plant Assessment Forms (Appendix C). Evaluation for eradication will not be possible until the source population has been eliminated. Even then, the seed bank can last 30 years under field conditions which extends timeframes for success measurements up to 35 years!

For other populations spreading onto Open Space Areas the objective is to create a 100 ft buffer zone with success being no more than a 5% French broom cover within this zone within five years. This will be

evaluated using GIS shapefiles combined with Invasive Plant Assessment Forms (Appendix C). Monitoring will occur on a yearly basis.

J. RESOURCE NEEDS

Time and cost estimates will be inserted later upon consultation with the SLO City Natural Resource Manager, Robert Hill.

Permits Required:

CA Department of Fish and Wildlife (CDFW) 2081(a) Research and Management Permit – If work is close to or may impact a state listed species under the California Endangered Species Act, CDFW should be consulted on which permits apply to the situation. For work in serpentine seeps around the Chorro Creek Bog thistle (*Cirsium fontinale* var. obispoense), most likely a 2081(a) Research and Management Permit would be recommended.

All herbicides sprayed should be done by a licensed and insured pesticide applicator. Reporting requirements exist through the California Department of Pesticide Regulation and are submitted through the local County Department of Agriculture.

State Water Resources Control Board National Pollution Elimination System (NPDES) Pesticide Permit for Weed Control - The State Water Resources Control Board adopted the Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications, Water Quality Order 2013-0002-DWQ, for the reissuance of General NPDES Permit CAG990005 in June 2013. Order 2013-0002-DWQ became effective on December 1, 2013.

This General Permit covers the point source discharge to waters of the United States of residues resulting from pesticide applications using products containing 2,4-D, acrolein, copper, diquat, endothall, fluridone, glyphosate, imazamox, imazapyr, penoxsulam, sodium carbonate peroxyhydrate, and triclopyr-based algaecides and aquatic herbicides, and adjuvants containing ingredients represented by the surrogate nonylphenol.

It is possible this permit would be needed for control of *G. monspessulana* in Prefumo creek or Reservoir Canyon creek if applications are made when there is water in the creek and there will be a point source discharge to the water column through direct application or drift. If this permit is needed, a corresponding “Aquatic Pesticide Application Plan” or APAP must be prepared. Yearly fees are also associated with this permit. A cut-stump technique or basal bark technique of herbicide application would eliminate the chance for drift into the water column.

K. RESULTS OF EVALUATION

(This section is to be filled in later, preferably within 1 year, when monitoring data has been taken and evaluated, at least preliminarily. The evaluation should be used to determine whether any of the sections B-K above should be modified.)

Scientific name: *Ailanthus altissima* **Common name:** Tree-of-heaven

Updated : June 31, 2015

A. PRIORITY High

B. DESCRIPTION

Tree-of-heaven tolerates shade, many types of pollution, and harsh soil conditions, including acidic soils of mine spoils and phosphorus-poor soils. It is found in a variety of habitats including disturbed areas, roadsides, urban waste areas, landscaped sites, riparian areas, grassland, and woodland. Tree-of-heaven is a fast-growing deciduous tree to nearly 70 ft tall. Fruits mature in late summer and seeds disperse from fall through the spring. Seed transport occurs through wind, water, and possibly birds. Seeds survive about 1 year under field conditions, typically not creating a persistent seed bank. Reproduction also happens vegetatively, through creeping roots. Tree-of-heaven is native to China.

C. CURRENT DISTRIBUTION ON THE SITE

Tree-of-heaven occurs in limited areas around the City of San Luis Obispo. It can currently be found in two isolated populations in the Irish Hills Natural Reserve (Map 23). No other populations are known in City of San Luis Obispo Open Space Areas.

D. DAMAGE & THREATS

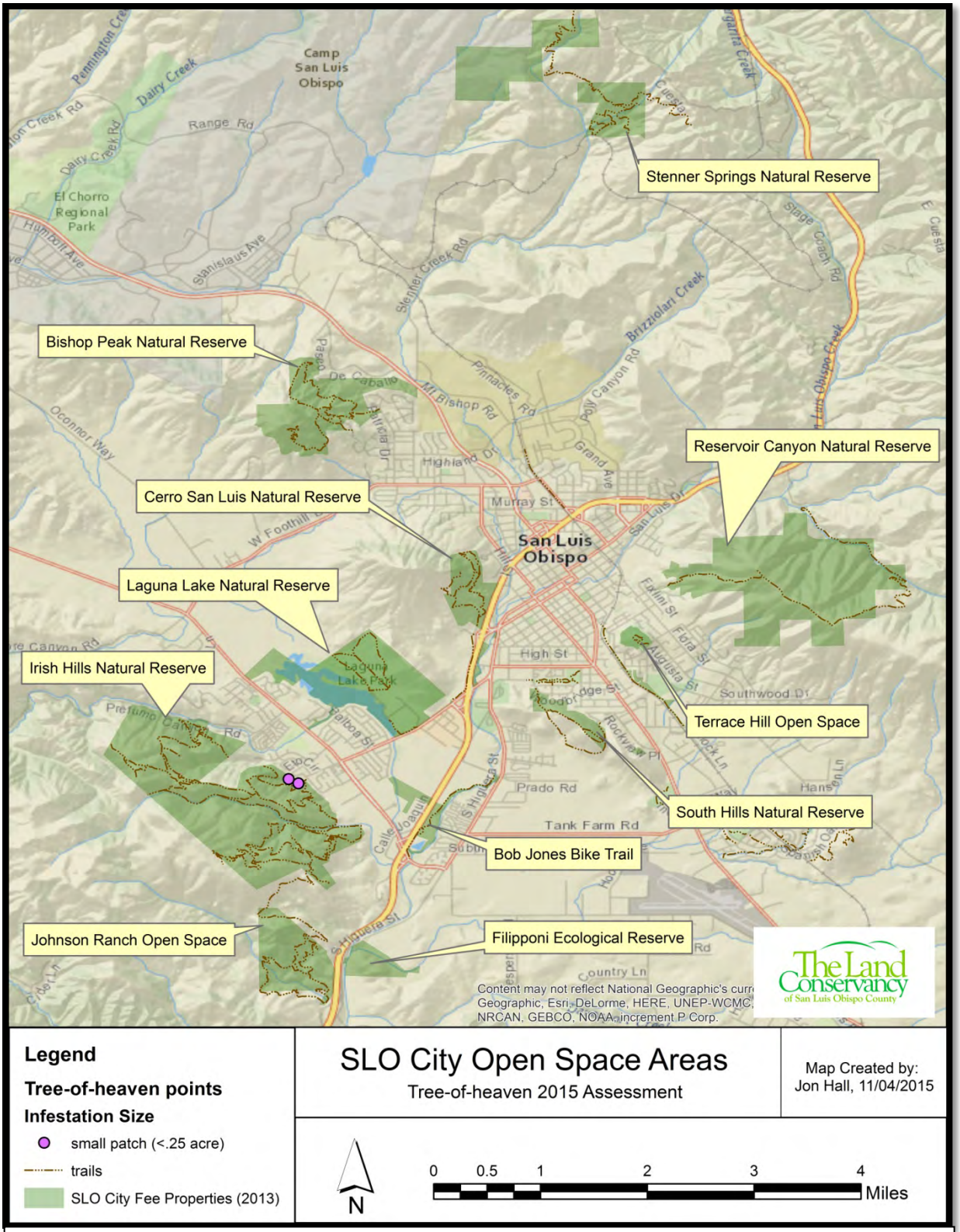
Tree-of-heaven forms dense thickets that compete with native vegetation and reduces wildlife habitat, particularly in riparian areas. Because of its ability to tolerate poor soil conditions, it may become a problem for rare plant communities isolated to serpentine soils.

E. GOALS

The long-term goal for this species is complete eradication from SLO City Open Space Areas. Due to its limited distribution in the San Luis Obispo Area and its short lived seed bank, eradication is an achievable and appropriate goal.

F. OBJECTIVES (Measurable)

Eliminate tree-of-heaven from all Open Space areas within 5 years.



Map 23. 2015 Invasive Plant Assessment showing *Ailanthus altissima* distribution in SLO City Open Space Areas.

G. MANAGEMENT OPTIONS

Viable control options are:

(1) No treatment;

(2) (Biological); There are currently no biological control agents available for *Ailanthus altissima*.

(3) (Cultural); A heavily shaded environment will reduce the establishment of tree-of-heaven.

(4) (Mechanical); Hand pulling or extraction with a weed extracting implement can be effective, but care must be taken to extract the entire root or stump sprouting will occur.

(5) (Chemical); The use of herbicides should always follow the label. There are numerous herbicides that have been shown to be effective at controlling tree-of-heaven.

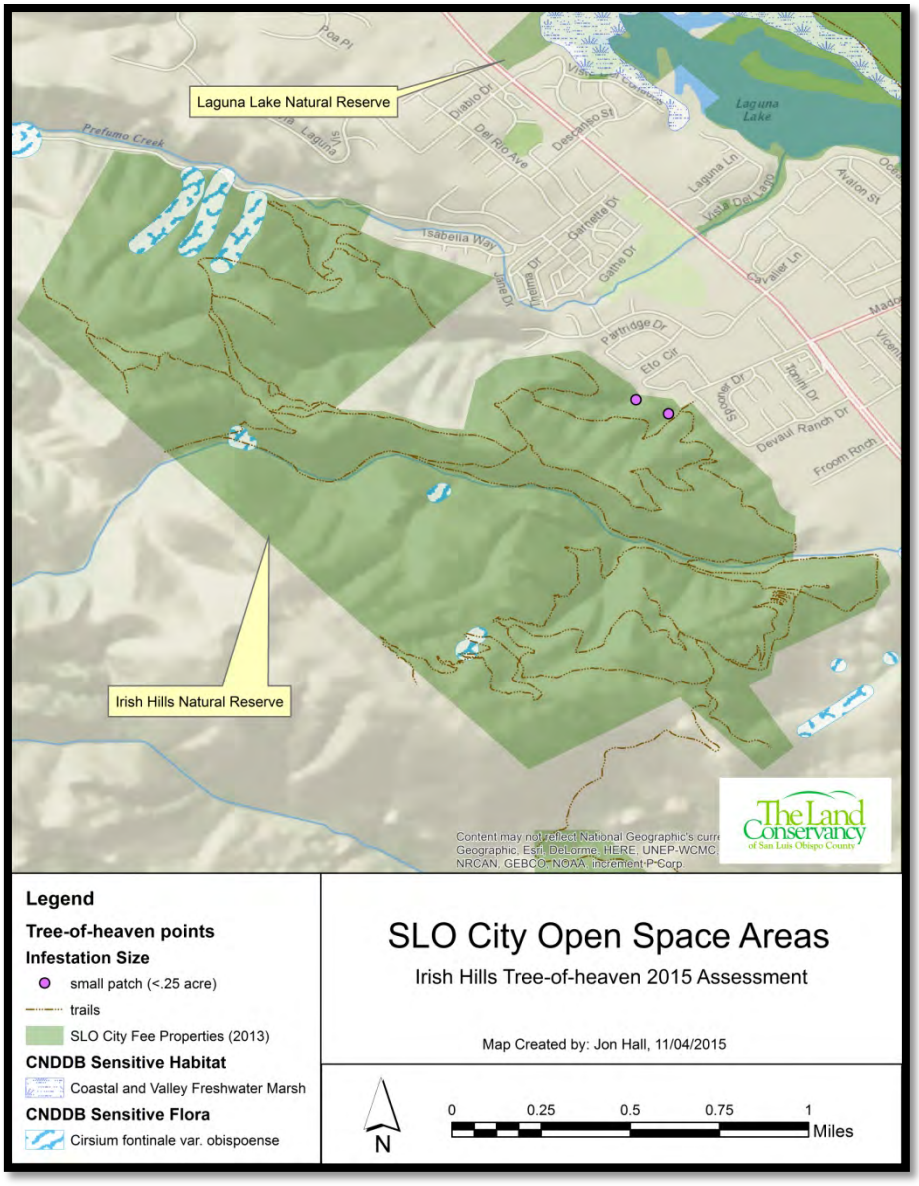
GROWTH REGULATORS	
Triclopyr *Garlon 3A, Garlon 4 Ultra, Pathfinder II* Aminopyralid + triclopyr *Capstone, Milestone Vm Plus*	**Application type(s):** High-volume spray-to-wet spot treatment: Basal cut stump treatment: Cut stump treatment: Basal bark treatment: Stem injection treatment: Hack-and-squirt treatment **Timing**: Foliar treatments best when leaves are fully expanded. Cut stump, basal cut stump, basal bark and stem injection treatments can be used anytime, but work best in late summer or early fall. **Remarks:** Triclopyr is a selective herbicide for broadleaf species. Foliar treatment should only be made on small trees, saplings, or seedlings. Plants treated with basal bark or stem injection technique should not be cut for at least 4 months following application.
AROMATIC AMINO ACID INHIBITORS	
Glyphosate *RoundupPro Conc, Aquaneat, others*	**Application type(s):** High-volume spray-to-wet spot treatment: Stem injection treatment: Hack-and-squirt **Timing:** Foliar treatments best when leaves are fully expanded. For stem injection treatments, root injury is increased when applied mid-June to mid-September (fall color). **Remarks:** Glyphosate is a nonselective herbicide. It gives good control with some resprouts.
BRANCHED-CHAIN AMINO ACID INHIBITORS	
Imazapyr *Habitat, Polaris*	**Application type(s):** Cut stump treatment: Stem injection treatment: Hack-and-squirt treatment: Basal bark treatment: **Timing:** Best when applied in late summer to early fall, but before leaf drop. **Remarks:** Imazapyr is a soil residual herbicide and may result in bare ground around trees for some time after treatment. Imazapyr is the most consistent and best stem treatment for tree-of-heaven.

H. ACTIONS PLANNED (Treatments and monitoring)

Irish Hills Natural Reserve: Presently, tree-of-heaven is restricted to two locations in the Irish Hills Natural Reserve (Map 24). The small size and geographic isolation of these populations make them suitable for a Category II Management Action:

> *Present in SLO City Open Space Areas as individuals or small, localized populations. Remove by hand or other precision control technique, and maintain a record of actions. Monitor the removal sites, following up with additional removal as needed. This kind of diligence keeps control costs low.*

The populations are small, but established enough to make mechanical removal difficult. The proposed control method is a "hack-and-squirt" or "stem injection" treatment of the plants in fall 2015 using an undiluted formulation of Imazapyr. Imazapyr takes a long time to have a complete kill. In early summer 2016 dead trees will be removed and any follow-up treatments from initial control will be undertaken with foliar spot spraying of and aminopyralid + triclopyr mix. Full eradication is anticipated by 2017.



Map 24. Tree-of-heaven (*Ailanthus altissima*) 2015 population assessment in Irish Hills Natural Reserve.

I. HOW ACTIONS WILL BE EVALUATED (Criteria for success)

For the Irish Hills Natural Reserve, the objective is eradication of tree-of-heaven within 5 years. This will be evaluated through annual monitoring using the Invasive Plant Assessment Forms (Appendix C) and before and after photos. Eradication will be determined after 3 years of monitoring with no new plants observed.

J. RESOURCE NEEDS

Time and cost estimates will be inserted later upon consultation with the SLO City Natural Resource Manager, Robert Hill.

Permits Required: All herbicides sprayed should be done by a licensed and insured pesticide applicator. Reporting requirements exist through the California Department of Pesticide Regulation and are submitted through the local County Department of Agriculture.

K. RESULTS OF EVALUATION

(This section is to be filled in later, preferably within 1 year, when monitoring data has been taken and evaluated, at least preliminarily. The evaluation should be used to determine whether any of the sections B-K above should be modified.)

4. REFERENCES

Ditomaso, J.M., G.B. Keyser et al. 2013. Weed Control in Natural Areas in the Western United States. Weed Research and information Center, University of California. 544 pp.

Mary Louise Flint, Patricia Gouveia. 2001. IPM in Practice: Principles and Methods of Integrated Pest Management. Publication 3418. Agriculture and Natural Resources Communication Services, University of California. 296 pp.

5. APPENDICES

Appendix 1. EMERGENCY INFORMATION: DIRECTIONS AND MAP TO NEARBY HOSPITALS OR CLINICS

Emergency Medical Care

The Land Conservancy of San Luis Obispo County

Arroyo Grande Community Hospital
345 South Halcyon Road
Arroyo Grande, CA 93420
(805) 489-4261

Sierra Vista Regional Medical Center
1010 Murray Ave
San Luis Obispo, CA 93405
(805) 546-7600

Emergency: 9-1-1 **SP Ranger: (805) 473-7220** **Poison Control: 1-800-222-1222** **LC Office: (805) 544-9096**

Appendix 2. HERBICIDE SPILL PROTOCOL

Updated 18 May 2011

Herbicide Safety and Spill Plan

Information and Equipment

All individuals applying herbicides will receive training on safety and application procedures prior to any herbicide application.

A copy of **labels** and **Material Safety Data Sheets (MSDS)** for all herbicides will be available at all times during project operations. A copy of The Land Conservancy's **Herbicide Exposure Protocol** will also be available at all times during project operations. Employees will be completely familiar with the information in these documents in case it is needed in the event of a spill or incident.

Required Personal Protective Equipment (PPE) will be worn at all times when herbicides are being mixed, transported, or applied. Label requirements for specific herbicides will be followed. Applicators and handlers must wear the maximum PPE required by the labels or the State of California, whichever is greater, for each herbicide being applied.

An emergency spill kit, with directions for use, will be present when herbicides are being mixed, transported, and applied. Employees will be trained in the use of the spill kit prior to initiation of operations.

The **spill kit** will contain:

- Tyvek Suit
- Chemical Sorbent Socks
- Chemical Absorbent Pads
- large plastic bags
- Nitrile gloves

Procedures for Herbicide Spill

Information in this section is derived from the EPA document "Applying Pesticides correctly: A Guide for Private and Commercial Applicators," and the rules and regulation of the State of California Department of Pesticide Regulation.

Small Spills (Less than 1 gallon of undiluted herbicide or less than 10 gallons of diluted herbicide mix)

- Qualified employees will be present to confine a spill.
- Follow MSDS guidelines for emergency first aid procedures in the event of an accidental exposure.
- Restrict entry to the spill area.
- Contain the spread of the spill with earthen dikes or sorbent socks.

- Cover the spill with absorbent material.
- Place contaminated materials into leak-proof container(s) and label.
- Dispose of contaminated material according to label instructions and State requirements.

Large Spills (More than 1 gallon of undiluted herbicide or more than 10 gallons of diluted herbicide mix)

- Keep people away from the spill.
- Follow MSDS guidelines for emergency first aid procedures in the event of an accidental exposure.
- Contain the spread of the spill with earthen dikes.
- Cover the spill with absorbent material.
- Spread the absorbent material around the perimeter of the spill and sweep toward the center.
- Call the direct supervisor and the local fire department; follow their instructions for further actions.

Procedures for Herbicide Mixing, Loading, and Disposing

1. Mixing of herbicides and adjuvants will be done at least 100 feet from well heads or surface waters.
2. Dilution water will be added to the spray container prior to addition of the herbicide concentrate.
3. Hoses used to add dilution water to spray containers shall be equipped with a device to prevent back-siphoning (a filter is acceptable), or a minimum 2-inch air gap.
4. Workers mixing herbicides will wear the maximum personal protective equipment required by the label.

Empty containers will be triple rinsed. Rinse will be added to the spray mix on the application site at a rate that does not exceed amounts addressed on the label. Unused herbicide will be stored in a locked facility in accordance with herbicide storage instructions provided by the manufacturer, and in accordance with the California Department of Pesticide Regulation. Empty and rinsed herbicide containers will be punctured and disposed of according to label directions.

Procedures for Herbicide Fire

1. Call the fire department (9-1-1).
    a. Inform them that there is a fire involving herbicides.
    b. Provide them with the names of the chemicals contained in the structure or vehicle.
    c. If possible, provide Material Safety Data Sheets to the arriving fire units.
2. Clear the area.
3. Evacuate and isolate the area around and downwind of the fire.

Appendix 3. Invasive Plant Assessment Form

WEED ASSESSMENT FORM

Observer Name:

Date:

Location ID:

GPS Location:

Weed Name:

Growth Stage:

- Seedling
- Rosette
- Bolting
- Flowering
- Fruiting
- Seed set
- Mature
- Dormant
- Dead

Extent of Infestation:

- Single Plant
- Scattered Plants
- Line (Along Road, Ditch, Fence, etc.)
- Small Patch (<.25 acre)
- Moderate Patch (.25 – 1 acre)
- Large Patch (1-5 acres)
- Very Large Patch (>5 acres)

Canopy Cover Class (based on Daubenmire classification):

- <1%
- 1-5%
- 5-25%
- 25-50%
- 50-75%
- 75-95%
- 95-100%

Abundance (abundance is based on the area occupied by a species relative to the area of its ecological niche):

- LOW - represents an infestation that is early on the invasion curve
- MEDIUM - represents the rapid expansion phase
- HIGH - represents an infestation that has filled the available ecological niche and is no longer spreading appreciably.

Trend (overall trend of plant population):

- Spreading Rapidly (doubling in 10 years) explosive growth.
- Spreading
- Stable
- Decreasing - population could be decreasing due to management or other factors.
- Absent - population is not found and presumed eradicated

Notes:

Optional Photo:

Appendix 4. HERBICIDE LABELS

Attach copies of the herbicide label(s) here.