SAN BRUNO MOUNTAIN
HABITAT CONSERVATION PLAN

Year 2013 Vegetation Management Activities Report
For Endangered Species Permit PRT-2-9818

Submitted to
United States Fish and Wildlife Service
By
San Mateo County Department of Parks
January 2014

SAN MATEO COUNTY
PARKS

FINAL REPORT

TABLE OF CONTENTS

SUMMARY VEGETATION MANAGEMENT.....1
I. INTRODUCTION.....2
II. INVASIVE SPECIES CONTROL BY MANAGEMENT UNIT 4
A. Southeast Ridge.....4
B. Brisbane Acres.....4
C. South Slope.....5
D. Owl/Buckeye Canyon.....6
E. Northeast Ridge.....6
F. Carter/Martin.....7
G. Hillside/Juncus Ravine.....8
H. Devil's Arroyo.....9
I. Dairy and Wax Myrtle Ravine.....9
J. Southwest Slope.....10
K. April Brook.....11
L. Saddle 11
M. Reservoir Hill.....12

III. ADDITIONAL TASKS.....12
A. HCP Oxalis Control Project.....12
B. Owl and Buckeye Canyons and the Wax Myrtle Ravine Coyote Brush Removal Project and Habitat Restoration 13

IV. Invasive Species Control Work (not funded by the HCP).....13
A. Terra Bay Master Homeowners Association Invasive Control Project.....13
B. Myers Peninsula Ventures, LLC., Office/Buffer Parcels Exotics Plan.....14
C. San Bruno Mountain Watch Exotics Control and Restoration Plan.....14
D. North East Ridge Vegetation Management on Toll Brothers, Inc Parcel B...15
E. CALCO Landfill Vegetation Management.....15

V. Restoration of Habitat 16
A. Restoration Guidelines for Mission Blue and Callippe Silverspot Butterflies.....16
B. HCP Habitat Islands.....17
C. Colma Creek and Saddle Bog Trail Watershed Project.....17
D. Oxalis pes-caprae Restoration Project.....18

VI. Conclusion 18
VII. References.....19

TABLES

Table 1. 2013 Invasive Species Treated on San Bruno Mountain by WCW, Inc..... 19
Table 2. Native Grasses and Herbaceous Revegation planted within the Oxalis control Coyote Brush Removal Projects.....20

FIGURES

Figure 1. San Bruno Mountain HCP Management Units.....21
Figure 2. San Bruno Mountain Hand and Herbicide Control Efforts 2013.....22
Figure 3. SBM Habitat Maintenance Daily Data Sheet 23
Figure 4. NE Ridge Treatment TOPO Map 1..... 24
Figure 5. Upper Valley Treatment TOPO Map 2..... 25
Figure 6. Owl & Buckeye Canyon Treatment TOPO Map 3.....26
Figure 7. Southeast Ridge Treatment TOPO Map 4.....27
Figure 8. South Slope Treatment TOPO Map5.....28
Figure 9. Hillside Treatment TOPO Map 6.....29
Figure 10. Radio Ridge Treatment TOPO Map 7.....30
Figure 11. Reservoir Hill Treatment TOPO Map 8.....31
Figure 12. Saddle Trail Treatment TOPO Map 9..... 32
Figure 13. Wax Myrtle Ravine Brush Removal and Restoration.....33
Figure 14. Owl & Buckeye Brush Removal and Restoration 34
Figure 15. Oxalis Control and Restoration Project 35
Figure 16. Parcel B Dedication Parcel Vegetation Management Units 36
Figure 17. Parcel B Dedication Parcel Weed Species 37

Report Prepared by:

West Coast Wildlands, Inc.
PO Box 1057
Pacifica, CA 94044
(650) 355-3589

Cover photo:
View of *Lupinus albifrons* at Linda Vista Mission blue butterfly habitat management site. Photos by: Todd Shriener, West Coast Wildlands, Inc.

SUMMARY VEGETATION MANAGEMENT

The primary focus of habitat management activities on San Bruno Mountain State and County Park since the inception of the San Bruno Mountain HCP in 1982 and the renewal of the HCP in 2013 has been the control of invasive species infestations that pose the greatest threat of displacing endangered butterfly and other native habitats. The majority of control is the use of hand puling, mechanical removal, and herbicide applications. The methods and scale of activities have shifted somewhat during the 2013 calender year (see below), however the overarching goal of protecting and enhancing as much endangered species habitat as possible with available resources has remained unchanged. Habitat management activities conducted on San Bruno Mountain in 2013 were conducted in accordance with the goals, objectives and success criteria established in the FY2012/2013 and FY2013/2014 San Bruno Mountain Habitat Vegetation Management Plans. The established priority areas for management of invasive species are outlined in the San Bruno Mountain Habitat Vegetation Management Plan 2007[1].

The primary habitat management activities conducted on San Bruno Mountain are performed by West Coast Wildlands, Inc., (WCW, Inc.) under contract to the Habitat Conservation Plan Manager, The San Mateo County Department of Parks. In addition, numerous volunteers working for San Bruno Mountain Watch conducted invasive species control and native plant revegetation projects on San Bruno Mountain.

The infestations are prioritized by the size of the mountain habitat within the San Bruno Mountain Management Units (Figure 1). The priorities are based on their threat to sensitive habitat areas, areas subject to invasive species control work (approximately 2,800 acres), and the expanding number of invasive species that require treatment (TRA 2007)[1].

Selective Herbicides (labeled caution), brush cutters & weed whip mowers, chainsaws, hand tools, and hand pulling are the current tools used to control the invasive plants. The target species treated with an herbicide solution containing either Garlon 4 Ultra® (triclopyr ester) or Aquamaster® (glyphosate). These herbicides are used due to their high effectiveness, low toxicity rating and short half-life in the soil. Garlon 4 Ultra® herbicide is the preferred chemical for broadleaf weeds and has little effect on monocots (grasses). Herbicide is applied one to four times per year in suitable weather (low wind, low humidity) for maximum plant uptake. The plants are left to decay in place, a process that takes from one to five years depending upon the size of the plants. In sensitive areas (near butterfly habitat and within 150 feet of private property) mature stands of invasive plants are removed by hand tools, chainsaw or mowing. A herbicide application is applied to the base of the cut stump when necessary.

The primary focus is the removal or control of non-native species consisting of shrubs and herbaceous species that pose the greatest threat to displace butterfly habitat and other native habitats. In 2013, emphasis was placed on those areas and the weeds that threatened the grassland butterfly habitat managed annually and newly threatened habitat sites.

The new weedy species of concern that are discovered are noted on the daily data sheet and WCW, Inc., and either the funds are diverted, where available, to treat these species or the plants are monitored and identified for control in the following year's budget.

There are recommendations made by the Technical Advisory Committee, who meet quarterly, are used to guide current and future weed control efforts. Two restoration projects in the FY2012/2013 and FY2013/2014 Vegetation Management Plans were initiated through discussion at the quarterly TAC meetings and the annual site visit in the Spring. The projects are a cooperative effort between WCW Inc., and the San Bruno Mountain Watch volunteers. The first project is coyote brush (*Baccharis pilularis*) removal along the Main Ridge Trail and Owl/Buckeye Sub Ridges followed with native perennial grass re-seeding. The second project is planting endangered butterfly host and nectar plants within oxalis treatment sites where Mission blue butterflies are observed during the annual monitoring schedule. Both projects were included in the FY 2013/2014 San Bruno Mountain State and County Park Vegetation Management Plan and out-planting was performed in the Fall of 2013 by the volunteer group

Summary of Scope-of-Work Changes for FY 2013/2014

1. Reservoir Hill: Moved funds and efforts at Point Pacific into the Brush Reduction Project
2. April Book: Moved funds and efforts from Radio Road to the Brush Reduction Project
3. Saddle Trail: Added two treatment sites of a non-native bunch grass (Velvet grass)
4. Wax Myrtle Ravine: Expansion of the brush reduction along Nine Fern Rock Ridge
5. So. West Slope: The Additional Task III A: The Oxalis Control Restoration Project efforts were reduced at Hoffman Ridge Site (RPA) but, maintain the control of invasive species. The Ridge Trail site (RPB) out-planting efforts were as schedule.
6. Owl and Buckeye Canyons: The Brush Reduction and Restoration Project will be expanded an additional 20 meters from the ridge. Tables 1-2 list the native plants to be included for the upcoming fiscal year.

I. INTRODUCTION

In 2013, 635 acres of invasive plants were treated using hand control, mechanical tools, and herbicide applications (Figure 2). The majority of the areas treated were visited 2 to 3 times for initial and followup control of various annual weed species and secondary growth of perennials.

The greatest efforts went into treating invasive species within key butterfly habitat areas on the South Slope, Northeast Ridge, Owl and Buckeye Canyons, the Saddle area, Juncus Ravine, the Ridge Trail, Pointe Pacific, the Hill West of Quarry, West Peak, and

Wax Myrtle Ravine. In addition, roadside and trailside areas along Radio Road, Old Ranch Road and Guadalupe Canyon Parkway were treated due to the high rate of recurring weed invasions of these disturbed areas.

West Coast Wildlands, Inc., maintains daily record sheets for all invasive species work conducted on San Bruno Mountain. The treatment sites are noted on the daily worksheet (Figure 3) with the treatment method, work effort, weather data and work site. The back of the daily worksheet is a topography map showing the treatment areas highlighted in red (Figures 4-12).

The invasive plants treated aggressively in 2013 (Table 1) include gorse (*Ulex europaeus*), French broom (*Genista monspessulana*), Portuguese broom (*Cytisus striatus*), cotoneaster (*Cotoneaster ssp.*), eucalyptus (*Eucalyptus globulus*), fennel (*Foeniculum vulgare*), radish (*Raphanus ssp.*), field mustard (*Hirschfeldia incana*), Armenian blackberry (*Rubus armeniacus*), jubata grass (*Cortaderia jubata*) and Bermuda buttercup (*Oxalis pes-caprae*). An aggressive oxalis treatment was added to the FY2012/2013 San Bruno Mountain Habitat Management Plan that includes newly discovered sites on the north facing slopes of the Ridge Trail in 2011. The 2013 follow up treatments showed a 50% reduction of the previous ground cover. *Oxalis pes caprae* is still one of the highest priority weed species of concern.

Fennel is also a high priority weed on the Mountain and populations have been significantly decreased in many locations on the South Slope, above Hillside School, Southeast Ridge and Juncus/Tank Ravines. A high level of follow-up maintenance was conducted on the fennel using brush cutters to remove duff and stimulate secondary growth that is then treated with a selective herbicide when the plant leafs out prior to seed production. Polaski hand tools are used to dig out tap roots adjacent to endangered butterfly host and nectar plants.

The 2008 Owl and Buckeye Canyon Burn Site was monitored for coastal scrub succession and reduction to improve the coastal grassland south of the Ridge Trail East as part of the new Coyote Brush Reduction Project. The project was implemented in the late Fall and early Winter of 2012 to remove coyote brush along the main ridge and sub-ridges followed by native perennial grass seed hand broadcast within the previous brush ground cover and efforts expanded in 2013. These areas are considered prime habitat for the Mission blue and Callippe silverspot butterflies.

Two additional fires started in September 2013 on the south side of San Bruno Mountain. The first was a small fire approximately 1/8 acre in size caused by a PG&E switch box. This fire was located at the Tank Ravine gate power pole. The second and larger fire took place at the Tank/Juncus Ravine area just west of Mills School above Hillside Boulevard near the intersection of Hillside and Chestnut. This fire was approximately 42 acres in size. The fire burned existing non-native weeds, thatch and brush that will be monitored throughout the Winter and Spring months for high priority weedy species that may volunteer onsite. The existing Fennel will be treated by herbicides if they leaf out and many of the coyote brush will be cut stump treated to enhance the native grassland habitat.

The native perennial grasses appeared to be burned just to the crown and were starting to leaf out in December 2013.

A significant amount of attention is also applied toward weeds that are not as pervasive as those listed above, but capable of altering community composition through competition within their micro habitat. These species include red valerian (*Centranthus ruber*), panic veldtgrass (*Ehrharta erecta*), and pin-cushion plant (*Scabiosa atropurpurea*).

II INVASIVE SPECIES CONTROL BY MANAGEMENT UNIT

A. Southeast Ridge (191 acres)

The Southeast Ridge (Figure 7) is located on the far eastern edge of the San Bruno Mountain and is bordered by Bayshore Boulevard and Highway 101 on the east and south, and the ridge trail on the north. The unit is mainly perennial grassland habitat on steep slopes and narrow bands of coastal scrub and some woodland vegetation within the ravines. The unit has significant *Lupinus albifrons* and *L. formosus* that are host plants for the endangered Mission blue butterfly and *Viola pedunculata* the host plant for the endangered Callippe silverspot butterfly along the upper ridge lines and on the northern slopes between Bayshore Boulevard and the ridge. The lower northern slope of this unit includes the Preservation Parcel.

The weeds of concern treated during 2013 were fennel (*Foeniculum vulgare*), summer mustard (*Hirschfeldia incana*), wild radish (*Raphanus ssp.*) and French broom (*Genista monspessulana*) using hand pulling, brush cutters and herbicide applications methods. The species density was highest in fennel, wild radish, and summer mustard along the Ridge Trail and towards East Point. The managed area in 2013 was 55 acres within the unit.

The Fennel along the southeastern sub-ridges were cut at the crown to remove the new and old seed stalks. This stimulates secondary growth and the plant will leaf out. This new growth is treated with a foliar herbicide application using Garlon 4 Ultra. A total of thirteen acres were managed with this method.

The French broom control under the eastern transmission towers had a 95% reduction in mature plants using a basal bark treatment and the *Oxalis pes-caprae* located on the south slope near Army Rd. was reduced by approximately 65% using the foliar herbicide method. The Preservation Parcel also showed a 75% reduction of *Oxalis pes-caprae* following an herbicide foliar application in the month January of 2013. A small patch of stink weed (*Dittrichia graveolens*) was found by Doug Allshouse, San Bruno Mountain Chair with CNPS, along the eastern fence line of Preservation Parcel and was treated in October 2013.

B. Brisbane Acres (190 acres)

The Brisbane Acres management unit (Figures 6 & 7) is bordered by the Southeast

Ridge management unit on the south side and the City of Brisbane on the north. Steep slopes, ravines and ridge lines compose a significant amount of the topography in the area.

The lower northern slopes are typified by non-native Monterey cypress, Monterey pine, French broom, and eucalyptus forests interspersed with native coastal scrub and coast live oak woodland. Residential development rims the northern boundary of the unit. Upper ridge areas are native perennial grassland and a lesser amount of northern coastal scrub. The unit has significant Mission blue and Callippe silverspot habitat along the upper ridge lines.

This management area contains private residences, infrastructure (including paved and unpaved roads, water tanks, drainage systems, etc.), and close proximity as a view-shed for the City of Brisbane. The area also includes a PG&E easement and is crossed by San Francisco Water District water supply lines.

Significant patches of Mission blue habitat are located along the Ridge Trail and on fire roads, rocky outcrops, and slumps within the unit. There are a few rocky outcrops supporting *Sedum spathulifolium* within the unit, which may provide very marginal habitat for the San Bruno elfin. A few ridge line locations also support populations of rare plants including *Diablo helianthella* and one documented location of San Francisco campion (*Silene verecunda ssp verecunda*).

The 2013 weeds of concern were managed using hand tools, mechanical equipment, such as, a DR mower, brush cutters and herbicide applications methods were bristly ox-tongue (*Picris echioides*), fennel (*Foeniculum vulgare*), summer mustard (*Hirschfeldia incana*), wild radish (*Raphanus ssp.*), and French broom (*Genista monspessulana*).

The highest weed species density in this management unit were fennel, wild radish, and mustard along the Ridge Trail while the French broom was scattered along the north-eastern section adjacent to water tank to the foot trail. The area covered was 40 acres within the management unit.

C. South Slope (477 acres)

This area is bordered by the Ridge Trail on the north and the Terra Bay development on the south. The South Slope management unit (Figures 4 & 5) is dominated by grasslands on steep, south facing slopes and ravines.

Small areas of coastal scrub with rocky intermittent drainage that occur within the ravines. Higher quality of native perennial grasslands are found on undisturbed middle and upper slope elevations. This unit has significant Callippe silverspot and Mission blue habitat throughout the unit, with important habitat along the Ridge Trail. There are small foot trails and old fire trails along some of the ridges.

The weeds of concern treated during 2013 using hand work, mowing and herbicide applications methods were Bristly ox-tongue (*Picris echioides*), Fennel (*Foeniculum vulgare*), summer mustard (*Hirschfeldia incana*), jubata grass , wild radish (*Raphanus ssp.*), and French broom. The species density was highest in fennel, wild radish and summer mustard along the Ridge Trail.

There were french broom and fennel scattered up slope of the Terra Bay Phase II Project drainage and old fire trails.The area covered was 105 acres within the management unit.

D. Owl/Buckeye Canyon (294 acres)

The Owl and Buckeye Canyons management unit (Figure 6) is partially owned by the California Department of Fish and Game and is managed by the County of San Mateo.

It is located along the southern and western border of the City of Brisbane. The area is characterized by steep canyons and ridge lines. Intermittent drainage are present in the larger canyons and associated ravines. Slopes are typified by native grasslands, coastal scrub, and coast live oak woodland. Upper ridges are typified by native grassland and prairie communities and a significant amount of northern coastal scrub. The canyons contain a dominance of native, undisturbed communities and a more diverse variety of habitats (coast live oak woodlands, riparian woodlands, seasonal marsh, and coastal scrub).

A gravel road, Army Road, connects the Quarry Road to the Ridge Trail. Older road cuts are found on the upper slopes on the west side of Owl Canyon, some of which provide habitat for the San Bruno elfin butterfly. The site maintains a high density of host and nectar plants for endangered species within the grassland areas and overall high ecological diversity.

The weeds of concern treated during 2013 using hand work, mowing and herbicide applications methods were bristly ox-tongue (*Picris echioides*), fennel (*Foeniculum vulgare*), summer mustard (*Hirschfeldia incana*), wild radish (*Raphanus ssp.*), and French Broom. The species density was highest in fennel, wild radish, and summer mustard along the Ridge Trail while the French broom was scattered along the north-eastern section adjacent from the water tank to the foot trail. The patch of *Oxalis pes-caprea* located west of Owl Canyon discovered in 2011 was treated in 2012 and 2013 with a reduction of 85% of the original stand.

This zone includes a 300-acre wildland burn site from 2008 (Figure 14), which covered Owl and Buckeye Canyons as well as part of the East Ridge Trail. The burn resulted in a reduction of coastal scrub vegetation that had migrated into the upper and lower grassland slopes of the unit. This initiated the Coyote Brush Reduction Project. The Ridge Trail and the north facing sub-ridges are now part of the Coyote Brush Reduction and Grassland Re-vegetation Projects and West Coast Wildlands' crew cut an additional 230 coyote brush between the two sub-ridges and

the upper Ridge Trail (Figure 15). The stumps were treated with 25% Garlon 4 Ultra® by painting the solution on the cut. The total area treated for weeds in 2013 was 60 acres.

E. Northeast Ridge (215 acres)

The Northeast Ridge (Figure 12) and the Guadalupe Hills areas include rolling hillsides, terraces, and slopes. It is an important habitat area for the Callippe silverspot and Mission blue butterflies. Grasslands are the dominant community and abundant host plants for both the Callippe silverspot and Mission blue are present.

Plant communities include valley needlegrass grassland, blue wild rye grassland, northern coastal scrub, non-native grassland, eucalyptus forest, and broom shrubland. The grasslands are dominated by non-native annual grasses and herbaceous weeds in many areas, yet the grasslands still support the rare butterflies and their host plants. Both Mission blue and Callippe silverspot habitat exists on the Northeast Ridge.

The weeds of concern treated during 2013 using hand work, mowing and herbicide applications methods were bristly ox-tongue, fennel (*Foeniculum vulgare*), summer mustard (*Hirschfeldia incana*), wild radish (*Raphanus ssp.*), and French Broom. The species density was highest in fennel, wild radish, and summer mustard along the Ridge Trail while the French broom was scattered along the north-eastern section adjacent to water tank along the foot trail. Control work on French broom, eucalyptus, and fennel has been effective;
however, non-native annual grasses and weeds such as Italian thistle and wild radish pose potential threats to the grassland. The French broom was either removed by hand or treated with a 25% solution of Garlon 4 Ultra using the thin line method. The Fennel was removed using hand tools, such as Polaskis, and with herbicides when the plant leafed out. The additional non-native annuals were mowed with brush cutters and some emerging plants were treated with a foliar herbicide application.

The Toll Brothers, Inc., have agreed to dedicate Parcel B at the Northeast Ridge to San Mateo County Department of Parks at San Bruno Mountain, a state and county park. The Toll Brothers contracted with West Coast Wildlands, Inc., to implement a 5-year vegetation management plan. A detailed summary of work to date is found in Section IV. D.

F. Carter/Martin (129 acres)

These rolling hills and steeper slopes have similar topography to the Northeast Ridge (Figure 4) management area. The Brisbane Technology Park and Bayshore Boulevard form the southeast border of this management area, while the Guadalupe Canyon Parkway forms the southwestern border. These slopes range from north to south facing, but have predominately northeastern exposure.

Plant communities include northern coastal scrub, valley wild rye grassland, non-native grassland, broom shrubland, and eucalyptus forest. Grassland communities dominate the most acreage within the unit. Though pockets of grassland enriched with a high percentage of native grasses and forbs occur in the area, there is a prominence of grasslands dominated by non-native annual grasses and other invasive herbs and shrubs.

The unit contains habitat for the Mission blue and Callippe silverspot butterflies. Areas of restoration, via planting islands, are present and provide host and nectar plants within this management unit. The connectivity to surrounding Northeast Ridge grasslands is an important vegetation management site due to the observation of the Mission blue butterflies.

The slopes above the Bay Ridge development on the west are exclusively dominated by thick stands of gorse, while the slopes above the Bay Vista and Linda Vista developments are a mixture of native and non-native scrub (French broom) along with non-native herbaceous infestations including oxalis, jubata grass, fennel, and Italian thistle. A high priority for this area is reversing the establishment of gorse, broom, and coastal scrub.

Our focus each year is the maintenance of the established Mission blue butterfly habitat located behind the Bay Vista and Linda Vista Development.
The weeds of concern were managed using hand work, mowing and herbicide applications methods were fennel (*Foeniculum vulgare*), wild mustard (*Hirschfeldia incana*), jubata grass , wild radish (*Raphanus ssp.*), and French broom. The highest species density was French broom seedlings within the established Mission blue butterfly host and nectar plant area throughout the cut slope. The French broom is primarily removed by hand surrounding these plants. The total treatment area is 10 acres.

G. Hillside/Juncus Ravine (217 acres)

The Hillside/Juncus Ravine (Figure 9) parcel area west of Hillside School is a combination of areas of low quality habitat adjacent to Pacific Nursery and Holy Cross Church coupled with steeper, rocky ravines and slopes (Juncus Ravine and Tank Ravine). There are PG&E transmission lines through Tank Ravine.

Plant communities include northern coastal scrub, coastal terrace prairie, valley needle grass grassland, central coast riparian scrub, valley wild rye grassland non-native grassland, and eucalyptus forest. The habitat sustains a high level of Mission blue butterfly habitat and moderate level for Callippe silverspot butterflies.

The two main weedy species onsite are Fennel and Bermuda buttercup. Fennel infestations that spread throughout the lower slopes in Tank and Juncus Ravines, had moved upslope into grasslands from the Pacific Nursery. The mature fennel was mowed from the roadside upslope to the Ridge Trail followed with polaski hand tools to remove all the remaining tap roots.

The secondary growth at the root crown was treated with a broadleaf specific herbicide and allow the surrounding native perennial grasses to volunteer into the weedy sites.

The Bermuda buttercup (*Oxalis pes-caprae*) is treated from December through the month of February (Figure 16). The late 2013 drought has reduced the emergence of the plant and only 10% of last years stands are visible. There was a burn that occurred in September 2013 that has also reduce the fennel and oxalis population. The total acreage treated throughout the year was 100 acres.

H. Devil's Arroyo (268 acres)

Devil's Arroyo (Figure 4) represents large expansive slopes covered mostly by dense coastal scrub. The Summit Trail forms the southern boundary, the Guadalupe Valley Quarry forms the eastern boundary, the Brisbane Industrial Park the northern boundary, and the eastern ridge line adjacent to Dairy Ravine forms the western boundary. Steep north-facing slopes and ravines extend from the base of the slope near the Brisbane Industrial Park to the Summit Trail. Plant communities include blue blossom chaparral, northern coastal scrub, coastal terrace prairie, valley needle grass grassland, central coast riparian scrub, eucalyptus forest, broom shrubland, and nonnative grassland.

The habitat for San Bruno elfin butterflies is high and moderate for Mission blue and Callippe silverspot butterflies. Manzanita Dike, the largest colony of San Bruno manzanita (CE, CNPS 1 B), is found in Devil's Arroyo. Montara manzanita (CNPS 1 B) is also found within this management unit.

There is an isolated population of Mission blue butterfly host plants *(Lupinus formosus*) located at the base of the ravine. Our primary weed management strategy is to control the species that potentially would out compete with host plant populations. Fennel is mowed to the root crown outside the 2-meter buffer zone and secondary root growth is treated at a later date. The gorse and broom species are also treated with a caution-rated herbicide outside the buffer zone using a basal bark or thin line treatment. Weeds within the buffer zone are hand removed using a polaski or weed wrench hand tool. The habitat site is about an acre but we monitor the 35 acres surrounding the site for weed encroachment.

I. Dairy and Wax Myrtle Ravine (214 acres)

Dairy and Wax Myrtle Ravines (Figure 5) have a combination of high quality native habitats and disturbed restoration areas. Most of the parcel is owned by the County of San Mateo, with portions at the lower elevation of Wax Myrtle Ravine owned by McKesson Properties, Inc. The unit consists of steep slopes that extend from the Brisbane Industrial Park along Guadalupe Canyon to the summit of San Bruno Mountain and includes a variety of vegetation types and slope exposures, with coastal scrub being the dominant plant community. Radio Road forms the northern

and western boundary of this unit, Devil's Arroyo and the city of Brisbane form the eastern boundary, and Guadalupe Canyon Parkway forms the southern boundary. The Friends of San Bruno Mountain established a native plant 'Botanic Garden' area on the south side of Radio Road within this unit.

The grasslands on the north side of Wax Myrtle Ravine have the highest densities of Mission blue and Callippe silverspot host plants and populations in this unit. The unit has high quality San Bruno elfin habitat located near Nine-fern Rock and within upper Dairy Ravine.

Our focus of control has been on eucalyptus, gorse, Armenian blackberry, French broom, jubata grass, cotoneaster, and oxalis throughout the unit.
The gorse, Armenian blackberry, French broom, oxalis, and jubata grass are treated with a 2% aquatic herbicide. The eucalyptus regrowth is treated with the hack-and-squirt method using machetes to access the cambian layer and sprayed with 25% Garlon 4 Ultra (Trichlopyr) herbicide. The eucalyptus is then left to decay onsite. The treated area covered 35 acres.

The sub-ridge along the trail to 9 fern rock was selected as a Coyote Brush removal area to maintain the grassland habitat for the Mission Blue and Callippe silverspot butterflies. The Coyote Brush and cotoneaster (*Cotoneaster* ssp.) was cut with loppers and hand saws and treated with a 25% solution of Garlon 4 Ultra. The seeded coyote brush reduction sites have not shown native plant recruitment to-date and the current drought conditions may be a major factor. The additional Coyote Brush removal sites, WM1 and WM2, were planted in December 2013 (Figure 13). The species list is noted in: Additional Tasks III.B.

J. Southwest Slope (436 acres)

Southwest Slope (Figure 10) is composed of steep south facing slopes on the west side of San Bruno Mountain. Summertime coastal fog strongly influences the vegetation, which is dominated by coastal scrub with patches of native grassland along ridgelines and isolated side slopes. The management unit is bordered by the CALCO landfill, the Cypress golf course, American Tower Corporation (that maintains communication equipment at the top of Radio Road), and a residential development within the City of Colma.

The County Park ranger station is located on the west peak. This management unit is composed of steep, rocky slopes and ravines dominated by coastal scrub vegetation. The western low elevation grasslands are dominated by purple needlegrass and fescue bunch grasses.

The federally endangered San Francisco Campion (*Silene verecunda ssp. verecunda*) is located within this unit on the upper slopes near Radio Road. Mission blue habitat is scattered within patches of grassland and the fire road ridge line. This small sub-unit is also habitat for the San Bruno elfin and Callippe silverspot butterflies.

The weeds of concern managed during 2013 were panic veldt grass *(Ehrharta erecta)*, bristly ox-tongue, jubata grass, fennel, summer mustard, wild radish, and French Broom using hand pulling, mowing and herbicide applications methods.

The species density was highest in fennel, wild radish, and summer mustard from the Ridge Trail to the Residential and AMLOC properties. The French broom was scattered along the north-eastern section adjacent to the transmission tower. The remaining control were to the sub-ridges that are mainly perennial grassland habitat with Mission blue and Callippe silverspot butterfly host and nectar plants. The management area totaled 100 acres.

The addition of the AMLOC Landfill weed management project that, is adjacent to the San Brumo Mountain County Park, began in September 2013 for 5 years noted in: IV.E., Invasive Species Control Work (Not funded by HCP).

K. April Brook (273 acres)

The April Brook management area (Figure 10) is characterized by a mosaic of native grasslands, coastal scrub and rock outcrops occurring over a range of topography from rolling hills to relatively steep slopes and ravines. The Guadalupe Canyon Parkway forms the northern border of this unit. The April Brook area covered by coastal prairie and moist scrubland. The Summit Trail loops through this management area. The lower slopes are typified by riparian forests and scrub along Colma Creek and associated drainage, while vegetation on the upper ridges are typified by fescue dominated prairies and rocky outcrops. Colma Creek flows westward and through the Colma Creek restoration site.

This management area has very limited Mission blue and Callippe silverspot habitat but, it provides moderate San Bruno elfin habitat and a single dune tansy (*Tanacetum camphoratum*) plant is present within this unit. The Colma Creek restoration site has two Mission blue habitat islands, and a mixture of grassland, coastal scrub, and arroyo willow riparian plant communities.

There has been continuous control of weeds such as gorse, cotoneaster, Italian thistle, and poison hemlock from the April Brook Trail to Bitter Cherry Ridge. The mature gorse plants have been absent for many years with seedlings still emerging annually from the reduced seed bank. There was on Jubata grass present adjacent to the creek and along with fennel and Italian thistle. All were treated with herbicides. The total managed area is 10 acres.

L. Saddle (320 acres)

The Saddle (Figure 12) is bordered by Guadalupe Canyon Parkway on the south and east, and the City of Daly City on the north and west. Due to the large infestation of gorse once present in this unit, the unit has been the site for intensive gorse control treatments including herbicide, brushing, and burning since the inception of the HCP in 1982.

The eastern slopes provide important grassland habitat for the Callippe silverspot and Mission blue butterflies. The north Saddle is mostly made up of steep, inaccessible slopes primarily covered by gorse.

The headwaters of Colma Creek and the botanically rich Saddle bog area are located on the western side of the unit bordering Guadalupe Canyon Parkway. Extensive freshwater marsh and riparian wetlands occur in the central portion of the bog. Colma Creek drains southward and under the Guadalupe Canyon Parkway.

Weed management has focused on controlling gorse, Armenian blackberry, jubata grass, and cotoneaster in habitat areas on the Saddle Trail for Callippe silverspot and Mission blue butterflies. A buffer zone has been established along the eastern parcel to hold the main infestation of gorse that extends from the trail to the Bay Ridge Development. Continued the annual weed efforts within the Colma Creek Bog restoration area and concentrating on the Armenian blackberry encroaching onto the wetland plants. The Saddle are covers 30 acres.

M. Reservoir Hill (127 acres)

This management unit (Figure 12) is bordered by Guadalupe Canyon Parkway on the east and the cities of Daly City and San Francisco on the west and north respectively. Plant communities include northern coastal scrub, coastal terrace prairie, eucalyptus forest, central dune scrub, and non-native grassland. Special-status plants found on Reservoir Hill include San Francisco lessingia (*Lessingia germanorum*; FE, CE, CNPS 1 B), and San Francisco spineflower (*Chorizanthe cuspidata var. cuspidate*; CNPS 1 B). Reservoir Hill has a high habitat value for Mission blue butterflies. The Pointe Pacific development, which was built in the early 1980's as part of the HCP occupies the central and western portions of the unit.

On the western side the unit has large expanses of coastal scrub with patches of grassland that extend from Guadalupe Canyon Parkway to the Pointe Pacific Development and Crocker Avenue to the north. The unit is composed of mostly steep slopes with the exception of the Pointe Pacific development, which is located on a plateau area. A large water tank is located on the highest peak within the development.

The high priority weed population has been greatly reduce and the efforts for this site were moved to more critical butterfly habitat efforts.

III. ADDITIONAL TASKS

A. HCP Oxalis Control Project

As part of the 2012/2013 HCP fiscal year budget, special funding was approved for aggressive control of Oxalis (*Oxalis pes-caprae*) and a restoration Project. Oxalis has been proliferating on San Bruno Mountain and is of concern as it can form

dense mats and out compete native plant species for light and space. Oxalis has also been found to inhibit the germination of some native plants (Brooks 2001). An aggressive plan was included in the FY2012/2013 San Bruno Mountain Habitat Management Plan to document and treat the new infestations (Figure 15). Base photos were taken of these sites in March 2011 and followup treatment photos are scheduled for March 2014.

The funding for oxalis control was approved for 2013/2014 fiscal year by the HCP Trustees and applied to follow-up treatment of the original control sites with some expansion of the mapped infestation. The 2012 sites observed downslope of the

Ridge Trail east of Juncus Ravine, Hillside, Upper Tank Ravine and above Pacifica Nursery located on Hillside Drive, Daly City and Mandalay Point, South San Francisco plus, Tank Ravine, Owl & Buckeye Canyon, South Slope, and Southeast Ridge were treated from January to March 2013. Approximately 15 acres were treated this past year with small pockets emerging mainly on to south facing slopes of San Bruno Mountain.

Oxalis found along the Ridge Trail growing under scrub vegetation, and along a ridge trail from the Ranger's Station to nearby the terminus of Hoffman Street (Daly City) showed an 85% decline. Other smaller infestations (Dairy Ravine, Radio Road, and below Brisbane Water Tank) are already treated as part of the general budget and work plan. The late winter observations has shown very little visible oxalis leafing out to-date.

B. Owl and Buckeye Canyons/Wax Myrtle Ravine Coyote Brush Removal Project and Habitat Restoration

West Coast Wildlands, Inc. placed five photo stations (Figure 14) within the burn site to monitor the regeneration of native and non-native plants. Each monitoring station is visited annually. There are two Buckeye Canyon photo stations along west of Army Road, facing west, two photo stations overlooking Owl Canyon, and one along Ridge Trail East. West Coast Wildlands, Inc., has continued the efforts to the FY2011/2012 HCP Exotics Control budget to reduce the coyote brush (*B. pilularis*) that has been gradually displacing the native perennial grassland habitat along Owl and Buckeye Canyons. Two methods are used to reduce the brush; 1) Cut stump treatment at the base of larger (> 2 in DBH) stumps removed by chainsaws and 2) Foliar application to secondary growth on smaller plants (<2 in. DBH).

There are currently seven additional photo stations in place for the coyote brush removal. The photo stations are label as CB1-7 and the brush removal plots are highlighted in green (Figure 14). CB 7 was added in the Fal 2013.The additional Coyote brush reduction sites are in Wax Myrtle Ravine and labeled WM1 & WM2 (Figure 13).

The list of native plants for Oxalis Control restoration and Coyote Brush Reduction projects for 2013 installed by the volunteers at San Bruno Mountain Watch are in Table 1.

IV. Invasive Species Control Work (not funded by the HCP)

Several supplemental invasive species control projects are currently being implemented on San Bruno Mountain in addition to the work funded through the HCP. Some of these projects are very large in scope and have resulted in a significant reduction in invasive weeds.

A. Terra Bay Master Homeowners Association Invasive Control Project

The Terra Bay Master Homeowners Association has eleven parcels of open space totaling approximately 25 acres bordering San Bruno Mountain State and County Park. The open space is within the HCP boundary parkland located on the western, southern and eastern boundaries. The members of the TBHOA Council accepted a bi-annual maintenance program to remove additional weeds to be funded on an annual basis. West Coast Wildlands, Inc., continues to treat invasive weed species with two visits per year; once in the Spring and once in the Fall.

The listed weed species are bristly ox-tongue, fennel (*Foeniculum vulgare*), French broom, summer mustard (*Hirschfeldia incana*), Bermuda buttercup (*Oxalis pes-caprae*), jubata grass , and wild radish (*Raphanus ssp*.).

The eleven parcels were initially brush cut to remove fennel seed stalks during the late Spring removing dead material to expose weedy root stems and initiate secondary growth and treat the emerging leaves with herbicide. The fennel seedlings were removed with a polaski hand tool.

Weed species within 24 inches of Mission blue and/or Callippe silverspot host and nectar plants were removed using hand tools with little disturbance to the soil. The jubata grass was treated with 2% Aquamaster herbicide. The Fall 2013 treatment showed a 99% reduction of all fennel, broom and jubata grass.

B. Myers Peninsula Venture, LLC., Parcels Exotics Control Project

In September 2009, Myers Peninsula Venture, LLC., hired West Coast Wildlands, Inc. to write a 3 year Exotics Control Plan and a contract was approved with WCW, Inc., to the treat primary weed species on two parcels that are adjacent to San Bruno Mountain State and County Park through the Fall 2011. The two sites total 21 acres and the treated area consists of 15 acres.

The Mandalay Point property managers, Wilson, Meeny LLC, accepted an bi-annual maintenance program to remove additional weeds to be funded on an annual basis.

The main weed species West Coast Wildlands treated are fennel (*Foeniculum vulgare*), summer mustard (*Hirschfeldia incana*), wild radish (*Raphanus ssp*), French broom, jubata grass , and Bermuda buttercup (*Oxalis pes-caprae*).

This initial and follow-up treatment continued through the Fall 2013. The current status of weed control is a 99% reduction of the primary mature weed species. The effort has been reduce to four hours of management per visit for maintenance.

C. San Bruno Mountain Watch Exotics Control & Restoration Projects (SBMW)

South San Francisco Weed Warriors Program

In June, a weeding group was formed to work along Hillside Trail in SSF. The group intends to meet twice a month for three hours. The weeds targeted were: *Carduus pycnocephalus*, Italian thistle; *Raphanus staves*, wild radish; *Crepis viscera*, hawksbeard; *Plantago lanceolata*, English plantain; *Erodium betrays*, long-beaked storksbill; *Silybum marianum*, milk thistle; *Sonchus oleraceus*, sow thistle; *Hypochaeris radiate*, wooly cat's ear; *Rumex acetosella*, sheep sorrel; *Foeniculum vulgare*, fennel; *Senecio vulgaris*, common groundsel; and *Oxalis pes-caprae*.

Mission Blue Native Plant Nursery

SBMW operates the nursery along with FSBM. The list of plants growing is available on the San Bruno Mountain Watch website – over 140 species. A dedicated crew come out once a week to plant seeds, tend plants, and general maintenance.

Volunteer Hours.

In all three programs, there were 600 SBMW volunteer visits to the mountain, resulting in 1800 hours of work.

The volunteer planted native species (Table 1) at the Owl and Buckeye Sub-Ridge and the Wax Myrtle Ravine Brush Reduction Sites

D. North East Ridge Vegetation Management on Toll Brothers, Inc Parcel B

The plan was initiated in September 2012 and will continue through 2017. The site is divided into three management units with two sub-units (Figure 16) controlling french broom, fennel, Italian thistle, wild radish, summer mustard, and eucalyptus seedlings (Figure 17).

The Fennel was mowed on slopes facing Guadalupe Canyon pkwy and along ridge of site. Portuguese and French broom were treated with a foliar application of Garlon 4 Ultra at 2% solution; mature stands were cut with chainsaws and stumps were treated with a solution of 25% Garlon 4 Ultra cut stump application. Denser patches of summer mustard and wild radish were also treated with a 2% foliar application of Garlon 4 Ultra.

A total of 40 Eucalyptus saplings along the boundary to the residential site were cut and treated with a 25% solution of Garlon 4 Ultra basal bark application. The Parcel has been visited 3 times since the inception of the Project in 2012 and is showing a 85% reduction in the mature listed weed species.

E. CALCO Vegetation Management Plan

The project is divided into 7 treatment areas and identified within the Landfill (Figure). It is scheduled from September 2013 to the Spring 2016. The CALCO Landfill is mostly surrounded by the San Bruno Mountain State and County Park along the Northern, Eastern and Southern borders. The project site also borders the Franciscan Country Club Mobile Home Park to the East and the Cypress Landfill to the South.

The San Bruno Mountain Habitat Conservation Plan lists the main property owner, Parcel no. 3-02-03, as San Mateo County Department of Parks surrounding the Landfill.

The dominant non-native perennial plants in the landfill are Sweet fennel, French broom and the Pampas grass. The remaining area is covered with other non-native perennial plants (i.e. Mustard and W. radish), bare ground, native perennial grasses and shrubs. The sites visits are in the Spring and Fall of each year until completed. The initial weed management started in September 2013.

V. Restoration of Habitat

For purposes of clarity, the term “restoration” is used to refer to areas planted and/or re-seeded with native plant species. Restoration sites also receive invasive

There are three methods used to control the weed species and consist of species control through the use of herbicide, mowing, hand weeding and/or other tools

to maintain the planted areas. As areas that are restored will generally require ongoing maintenance, “restored” is understood to mean that the goals and objectives of the restoration project were met, regardless if ongoing maintenance will be required.

Restoration is a measurement used by the County of San Mateo for their Outcome Based Management.

A strategy of creating small habitat islands (up to approximately 1/2 acre in size) was developed. Maintaining these sites over time requires ongoing management to control invasive species and brush succession. The primary goal of the restoration work has been to establish habitat for the endangered Mission blue (MB) and Callippe silverspot butterflies. The Planting Islands have been slow to germinate additional host and nectar plants from the seeds within the islands.

It should be noted that the Mission blue’s host plants (lupines) are often patchy in their distribution, and will colonize disturbed road cuts, landslides, and trails.

Mission blues utilize these patches, and can easily move between patches that are 100 meters apart (Arnold 1983), and have been recorded moving distances up to 0.25 miles (TRA 1981) between habitat patches.

In contrast, Callippe silverspot butterflies utilize greater areas of habitat due to their larger size and stronger flying ability. The Callippes can move several hundred feet within less than a minute when traveling across terrain searching for violet and appropriate hilltopping habitat (San Bruno Mountain Habitat Management Plan 2011), and can likely travel as far as 0.75 miles between habitat patches (TRA, 1981). The Callippe's host plant, *Viola pedunculata*, typically occurs in much larger, denser patches than lupines do, though violets can also on occasion be found in small patches and in disturbed areas.

Restoration is important to enhance special status species, the first priority should always be to protect the existing habitat, because that is the best use of current funds for ensuring the long-term survival of both MB and CS on San Bruno Mountain (Biological Program, HCP Volume I, 1982).

A. Restoration Guidelines for Mission Blue and Callippe Silverspot Butterflies

HCP funded restoration work in the form of weed control, erosion control and planting has been ongoing on the mountain since the mid-1980's.

The primary goal of the restoration work is the establishment of high quality habitat for the Mission blue and Callippe silverspot butterflies.

The HCP does not specify what is required for successful restoration, (i.e. number of host plants established, percent cover of natives, etc.) *The Habitat Restoration Guidelines for MB and CS* (TRA, November 2000) provide guidelines for restoring suitable Mission blue and Callippe silverspot butterfly habitat, and assist restoration professionals with accomplishing the habitat goals of the HCP.

The guidelines include suggested methods on how to select appropriate restoration sites, recommendations on host plant densities to support the endangered butterflies, and host and nectar plant propagation methods. They are to be used in conjunction with the *Standards for Acceptance of any Dedicated Lands by the County of San Mateo in Accordance with the San Bruno Mountain Area Habitat Conservation Plan*, prepared by the San Mateo County Department of Parks.

B. HCP Habitat Islands

The new Habitat Islands are currently being created within the Oxalis Control and the Coyote Brush Reduction Projects.

C. Colma Creek & Saddle Bog Trail Watershed Project

The project is currently managed by the San Mateo County Department of Parks through the San Bruno Mountain HCP Vegetation Management Plan. There is a maintenance program to control invasive species within the Bog area.

D. Oxalis pes-caprae Restoration Project

This project is a cooperative working group between West Coast Wildlands, Inc., and the SBMW volunteers. Two Oxalis treatment sites were chosen that have Mission blue(MB) Callippe fritillary (CF) butterfly observations annually. The first site is the MB butterfly location at the western end of the Hoffman Ridgeline and the Second site is CF location along the Ridge Trail 100M from the eastern transmission towers (Figure 15).

The Oxalis is treated during the December/January months of 2012/2013 and SBMW planted native perennial native grasses after weed dieback. Plants will not be affected by any residual herbicides that either become inert when it comes in contact with soil or sunlight dilution. The project is scheduled to continue for 3 years.

VI. Conclusion

The weed management of most sites are to cover existing weed threats surrounding and within the endangered butterfly core habitat. We have been limited to about 600 managed acres each year with the current funding and try to place the efforts that best suit the maintenance of those core habitats. As the high priority weeds are removed secondary invaders become our next weed management problem to control. This limits how much additional weed managed sites and effort are added to the overall annual butterfly habitat maintenance and/or enhancement plan. The TAC is advised of the current status of the target areas each, the presence/absence of weeds in the management units and a discussion of how best to apply the funds. This year we added more effort to the Brush Reduction and Oxalis Control Projects

The additional tasks that included removing coyote brush and out planting was successful in the control of the scrub but, had a 75% planting mortality rate. There was significant hand watering done in the late winter to early spring months of 2013. Those plants that were successful tended to be herbaceous and the grasses tended to die off quicker. The revegetation areas that had the easier access also did better in establishing growth than those that were in more open space zones. The current brush reduction and restoration sites have been placed closer to trails to improve watering during periods of low rainfall or coastal fog drip.

The Oxalis emerged a later time and with less foliage in the Early winter months of 2013 due to the drought conditions. With the reduction of the plant leafing out we are considering expanding the Brush Reduction Project by another 10%.

VII. [1]References

Brooks, K. 2001. Managing weeds in bushland: Soursob, fingerleaf & four o'clock. The Environmental Weeds Action Network (http://members. iinet.net.au/~ewan/oxalis. pdf). [Accessed: December 2005]

County of San Mateo, 1982. San Bruno Mountain Habitat Conservation Plan, Volume I and II. Prepared by Thomas Reid Associates.

San Mateo County Department of Parks, 2013. San Bruno Mountain Habitat Management Plan 2013. Prepared by West coast Wildlands, Inc..

San Mateo County Department of Parks . Standards for Acceptance of any Dedicated Lands by the County of San Mateo in Accordance with the San Bruno Mountain Area Habitat Conservation Plan. Revised 2006.

San Mateo County Department of Parks . Habitat Restoration Guidelines for Mission Blue and Callippe Silverspot butterflies (revised November 2000). Prepared for the San Bruno Mountain Habitat Conservation Plan. Prepared by TRA Environmental Sciences.

Thomas Reid Associates. November, 1981. Endangered Species Survey: San Bruno Mountain Biological Study.

Thomas Reid Associates. September, 2007. San Bruno Mountain Habitat Management Plan 2007: Prepared by TRA Environmental Sciences: Patrick Kobernus.

Thomas Reid Associates. January, 2014. San Bruno Mountain Activities Report for Special -Status Species 2013: Prepared by TRA Environmental Sciences: Autumn Meisel.

TABLES

Table 1. Invasive Species treated on San Bruno Mountain by West Coast Wildlands

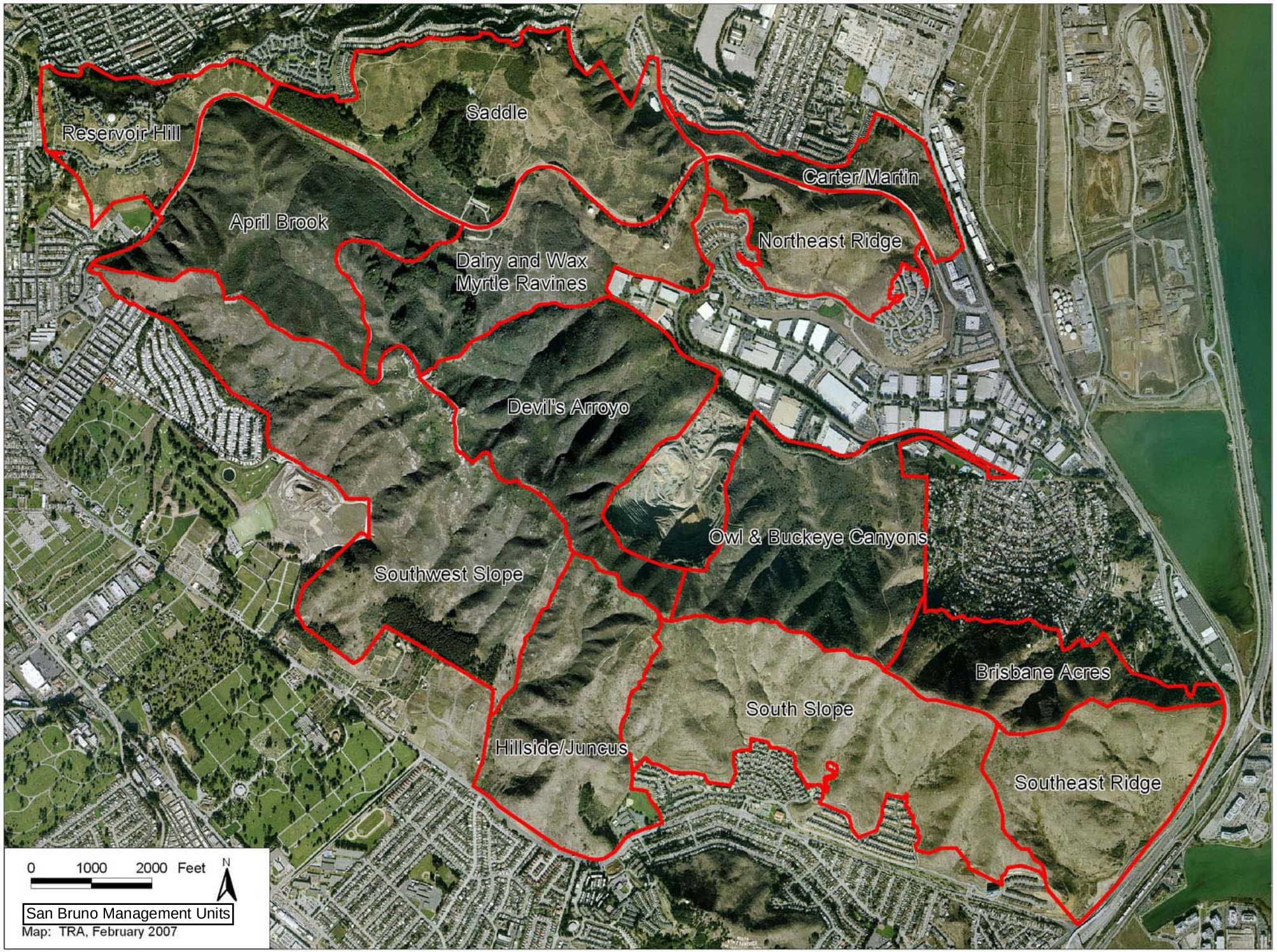
Acacia sp. (acacia)	Euphorbia lathyris (Caper spurge)
Carduus pycnocephalus (Italian thistle)	Foeniculum vulgare (fennel)
Carpobrotus edulis (hottentot fig, iceplant)	Genista monspessulana (French broom)
Centaurea melitensis (Napa thistle)	Hirschfeldia incana (mustard)
Conium maculatum (poison hemlock)	Lactuca virosa (wild lettuce)
Cortaderia jubata (Jubata grass)	Leucanthemum vulgare (ox-eye daisy)
Cotoneaster sp. (cotoneaster)	Oxalis pes-caprae (Bermuda buttercup)
Cupressus macrocarpa (Monterey cypress)	Pinus radiata (Monterey pine)
Cytisus scoparius (Scotch Broom)	Picris echioides (bristly ox-tongue)
Cytisus striatus (Portuguese broom)	Raphanus ssp. (radish)
Delairea odorata (Cape ivy)	Rubus armeniacus (Armenian blackberry)
Echium candicans (Pride of Madera)	Silybum marianum (milk thistle)
Eucalyptus globulus (blue gum tree)	Ulex europaeus (gorse)

Table 2. Native Grass and Forb Species planted within the Coyote Brush removal and the Oxalis Control Revegetation areas on San Bruno Mountain in 2013 by San Bruno Mountain Watch

2013 Scrub Removal and	Oxalis Revegetation Projects		
Grassland Perennials:		%	3000 plants
Scientific name	Common name:		
Acaena pinnatifida	Acaena	8	120
Achillia millefolium	common yarrow	8	120
Agoseris grandiflora	large flowered agoseris	7	105
Eriogonum latifolium	coast buckwheat	8	120
Erysimum franciscanum	Franciscan wallflower	7	105
Grindelia hirsutula maritima	coast gumplant	7	105
Heterotheca sessiflora bolanderi	golden aster	7	105
Horkelia californica var californica?	Horkelia	5	75
Lomatium dasycarpum	lace parsnip	8	120
Lupinus albafrons	silver lupine	3	45
Lupinus variicolor	varied lupine	3	45
Monardella villosa villosa	coyote mint	3	45
Phacelia californica	California phacelia	8	120
Sisyrinchium bellum	blue-eyed grass	8	120
Solidago canadensis elongata	meadow goldenrod	8	120
Wyethia angustifolia	mule ears	2	30
	Total:	100	1500

Native Grasses:			
Scientific name	Common name:	%	
Bromus carinatus	California brome	20	300
Danthonia californica	California oat grass	10	150
Elymus glaucus	Blue wildrye	20	300
Festuca rubra	red fescue	15	225
Koeleria macrantha	June grass	10	150
Melica californica	California melic	5	75
Nassella pulchra	purple needlegrass	20	300
	Total:	100	1500

Figure 1. San Bruno Mountain HCP Management Units



San Bruno Mountain Hand & Herbicide Control Work 2013

FIGURE 2

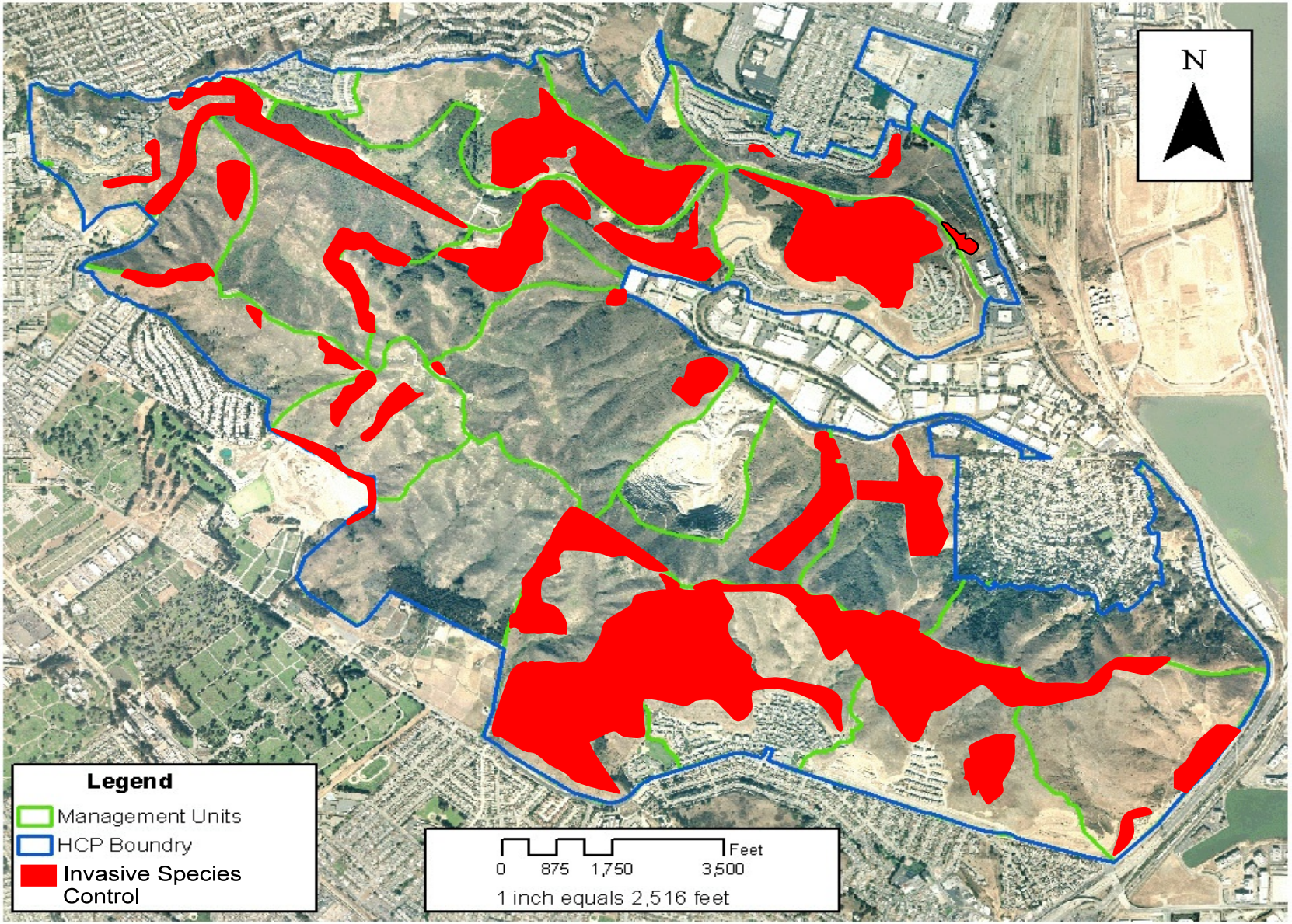


FIGURE 3: Daily Data Sheet

DATE:_____/_____/_____ NAME:_____ CASE CODE: ____HMAI TASK# _____ EFFORT: ___1) MONITORING
HOURS: Prep___:___ to ___:___ WORKERS:_____ ____HRES ____2) HERBICIDE
Control___:___ to ___:___ _____ ____HWMR ____3)HANDWORK
Clean-up ___:___ to ___:___ _____ ____4) RESTORATION

FC: _____ Hrs:____
_____ ____
_____ ____
_____ ____
_____ ____
FS:_____ ____
_____ ____
SR:_____ ____

LOCATION: (MAP AREA on reverse side of page) ____Initial Treatment ____Mo. Follow-up Treat(2nd,3rd,etc.)

___1. Tank ravine
___2. Hillside
___3. Juncus Ravine
___4. Terra Bay Habitat
___5. SER\Canon sign
___6. Ridge Trail-East
___7. Ice House
___8. Preservation Parcel
___9. Owl/Buckeye Cyn
___10. Hill W. Quarry
___11. Red Tail Cyn
___12. Devil's arroyo
___13. Water Tank/Spumoni
___14. Callippe Hill/Arnold
___15. NER Fence line
___16. Linda Vista/E. End
___17. Linda Vista/SBM
___18. Brisbane Off. Park
___19. Old Ranch road
___20. Saddle Unit I, site(s) _____
___20. Saddle Unit II, site(s) _____
___20. Saddle Unit III, site(s) _____
___20. Bog Trail
___21. Radio Rd/Summit
___22. ***Other** Site
___23. Guadalupe Cyn. Pkwy
___24. Pt. Pacific/Village
___25. Bitter Cherry
___26. Ridge lines/W. Peak
___27. Ridge lines/Hoffman
___28. Colma Creek
___29. April Brook
___30. Dairy Ravine
___31. Wax Myrtle Ravine (**Upper**)
___32. Hoffman St.
___33. Kamchatka Ridge

WEATHER:
Weather at start:
____ Clear
____ Overcast ____% Cloud Cover
____ Wind ____mph
____ Vegetation: ____dry____damp

Weather at stop:
____ Clear
____ Overcast ____% Cloud Cover
____ Wind ____mph

***Other** Site:_____

INFESTATION: **CONTROL EFFORTS:**

SPECIES	DENSITY (L/M/H)	AREA (ft/acre)	TERRAIN (E/M/D)	MAP ID Site Treated	EQUIPMENT & TOOLS	# OF PLANTS REMOVED	CHEMICALS					
							HERBICIDE(S)			ADDITIVES		TOTAL SOLUTION
								%	oz/gal		oz	oz/gal
								%	oz/gal		oz	oz/gal
								%	oz/gal		oz	oz/gal
								%	oz/gal		oz	oz/gal
								%	oz/gal		oz	oz/gal
								%	oz/gal		oz	oz/gal
								%	oz/gal		oz	oz/gal
								%	oz/gal		oz	oz/gal

MONITORING/ASSESSMENT DATA:
_____ PHOTO(S) TAKEN: ROLL # _____ NEGATIVE # _____
(Describe appearance of vegetation. Include color(s), presence/absence of green stems/flags, presence of flowers, level of dessication, any other pertinent information regarding the effects of treatment on the vegetation. Also provide an estimate for follow-up treatment. Include type, # of persons, time, and amount of chemicals.)

Figure 4: North East Ridge

Figure 5: Upper Valley

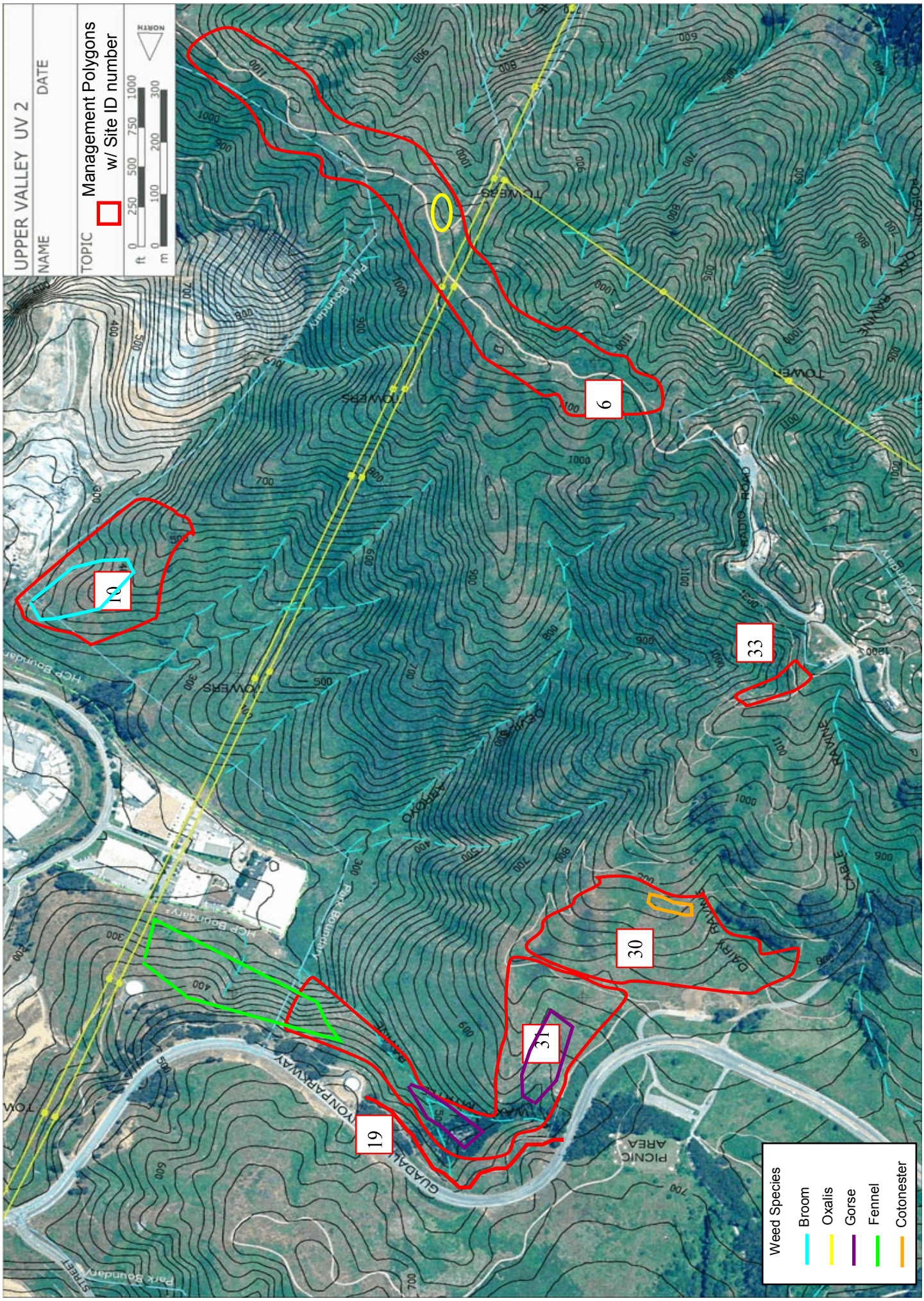


Figure 6: Owl & Buckeye Canyon

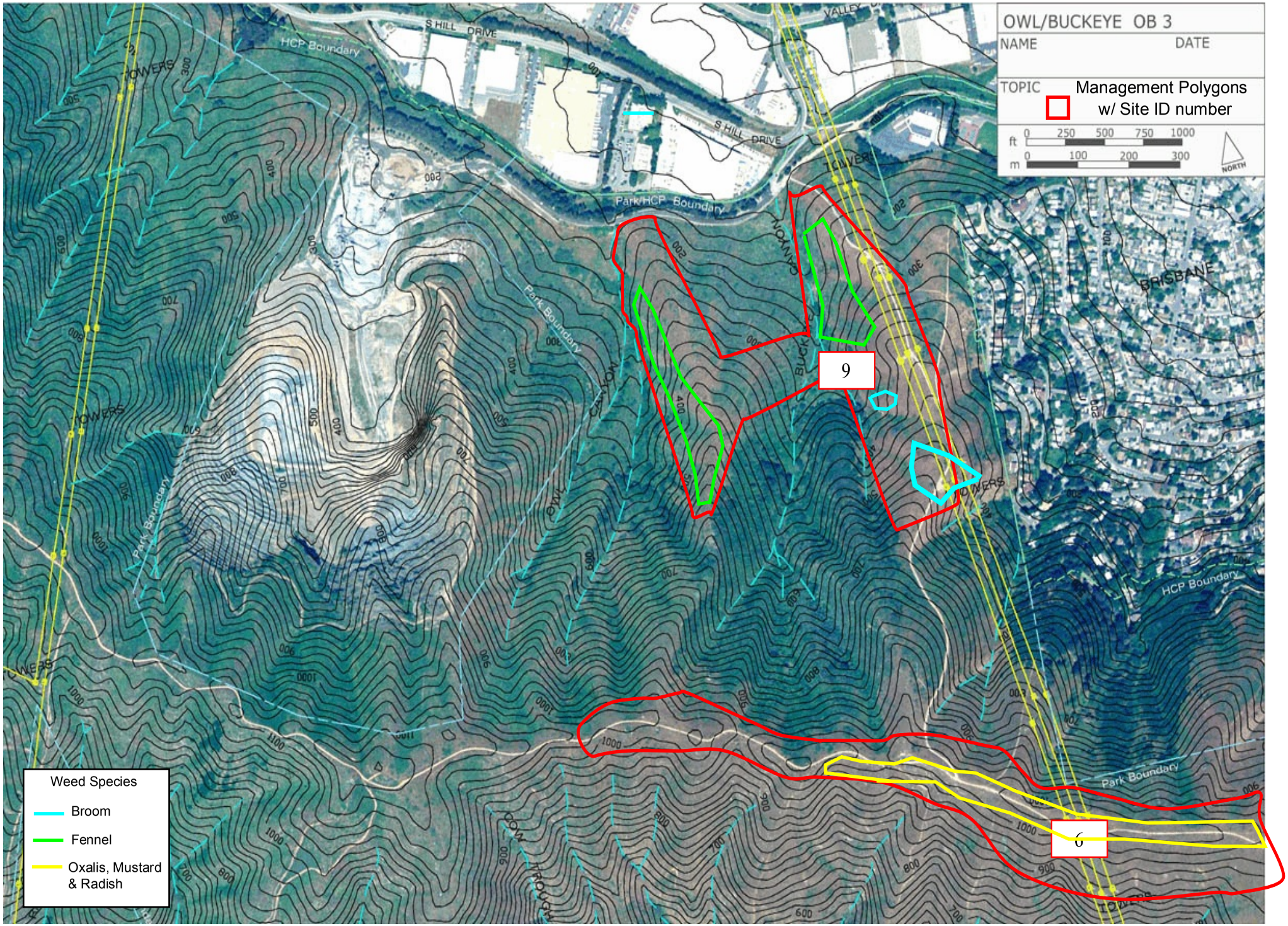


Figure 7: Southeast Ridge

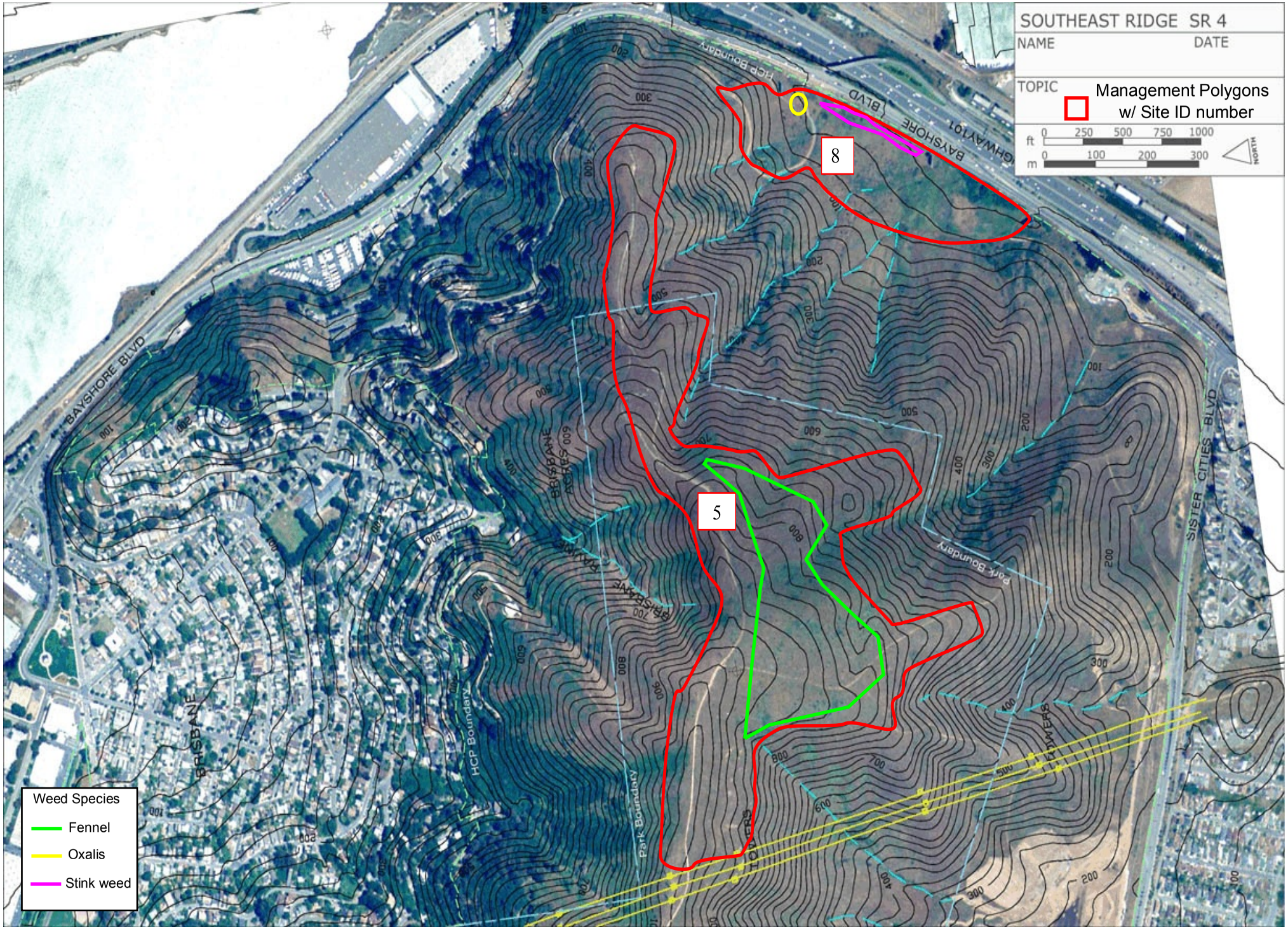


FIGURE 8: South Slope

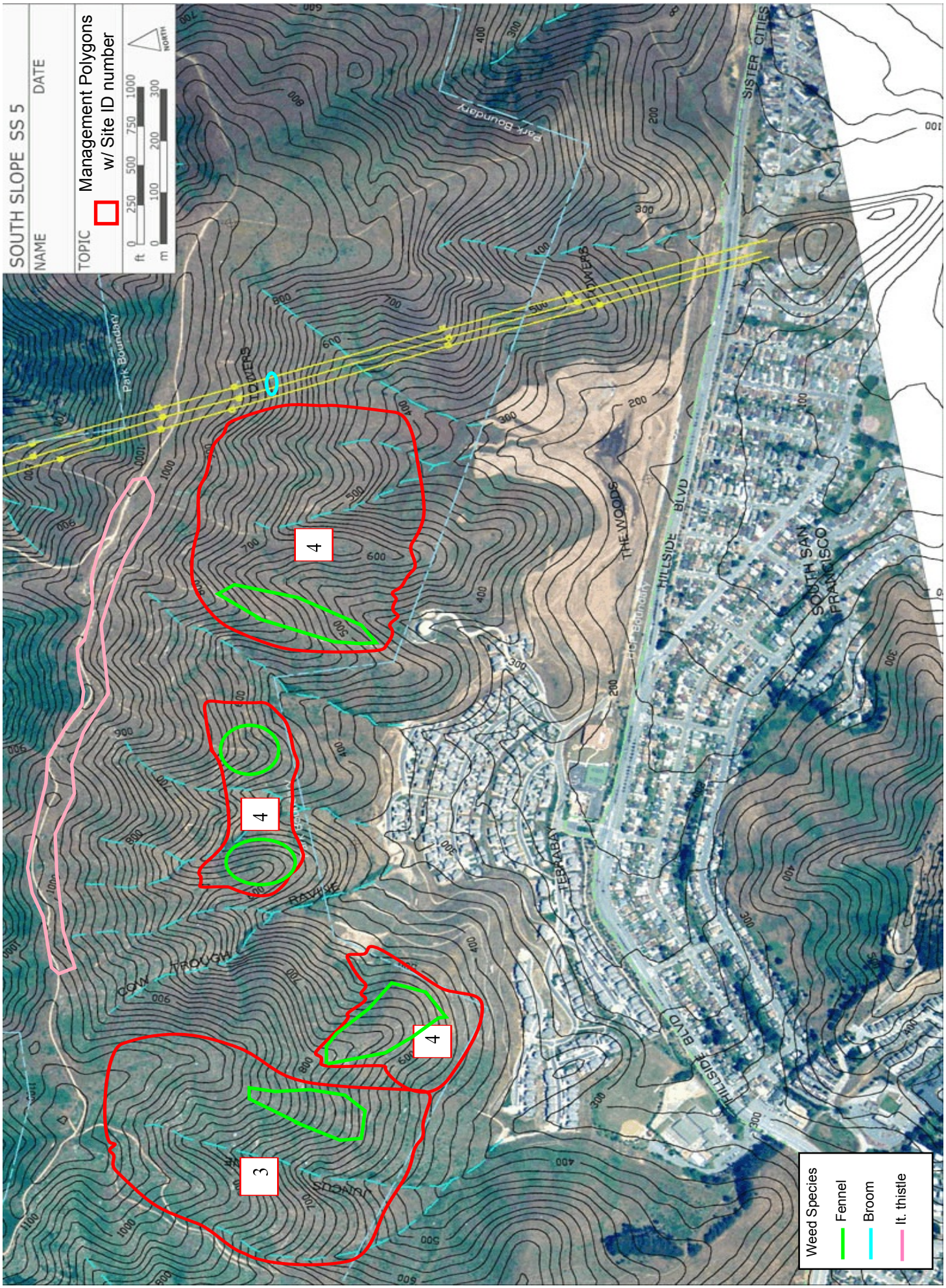


FIGURE 9: Hillside

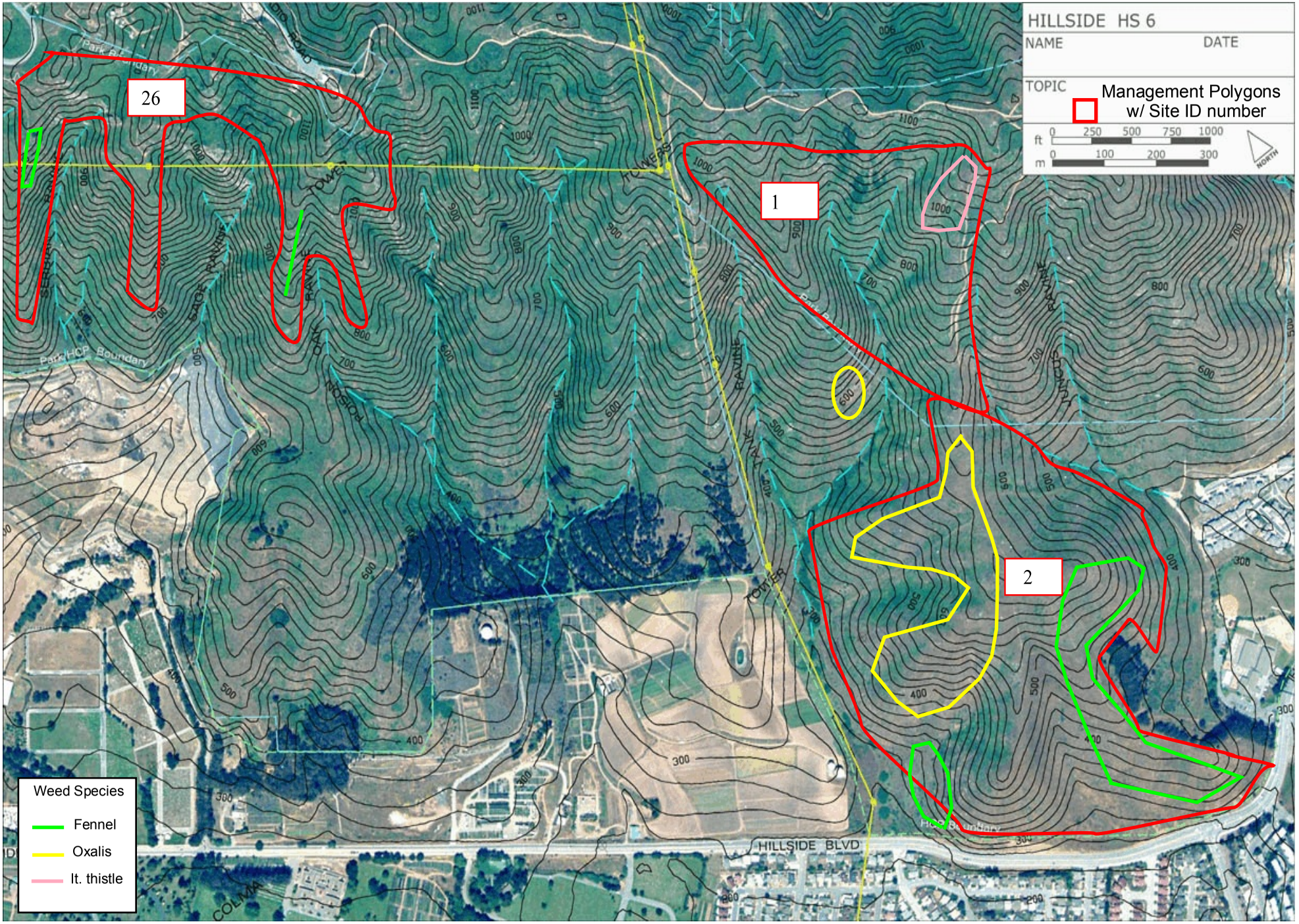
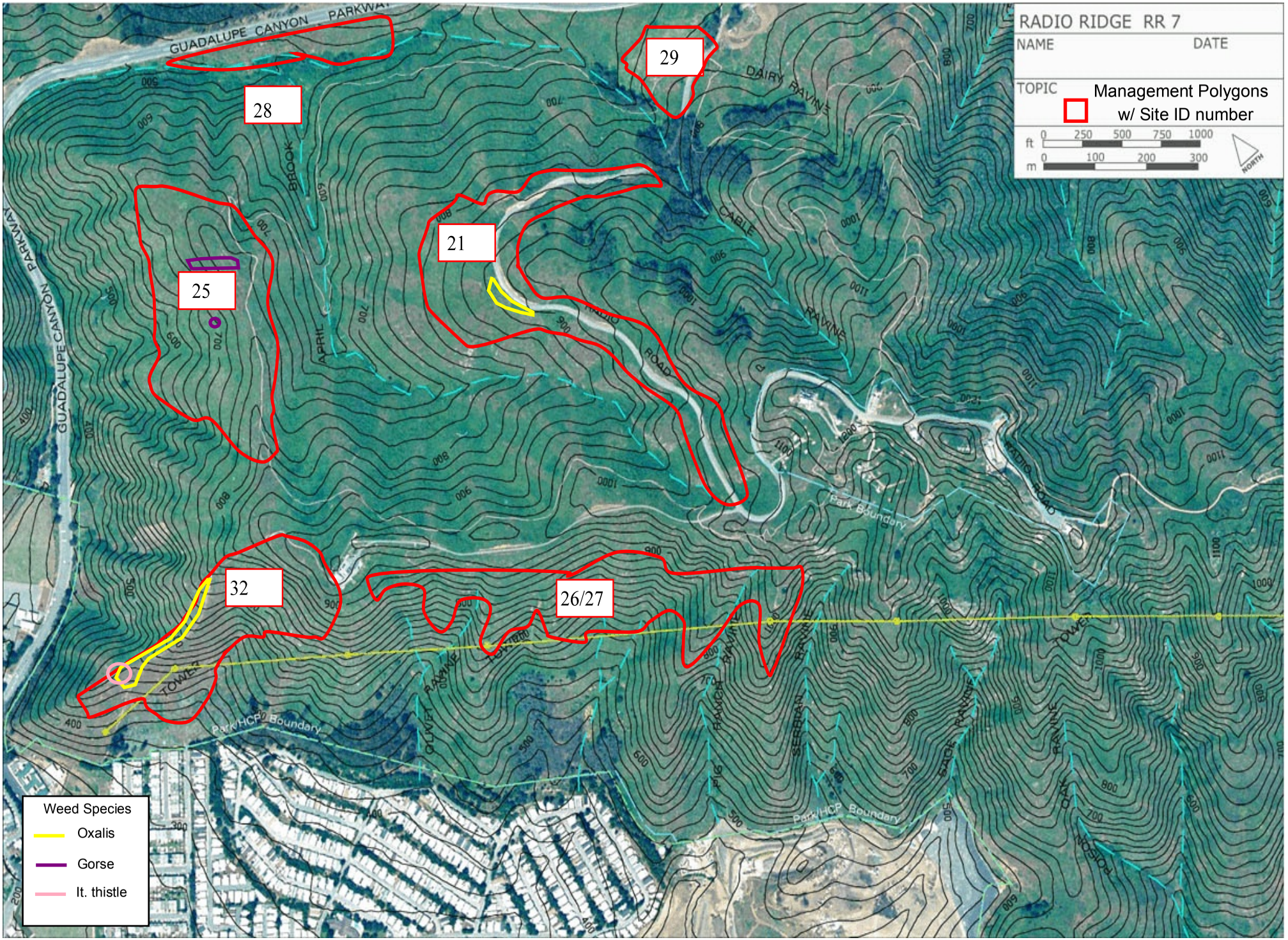


FIGURE 10: Radio Ridge



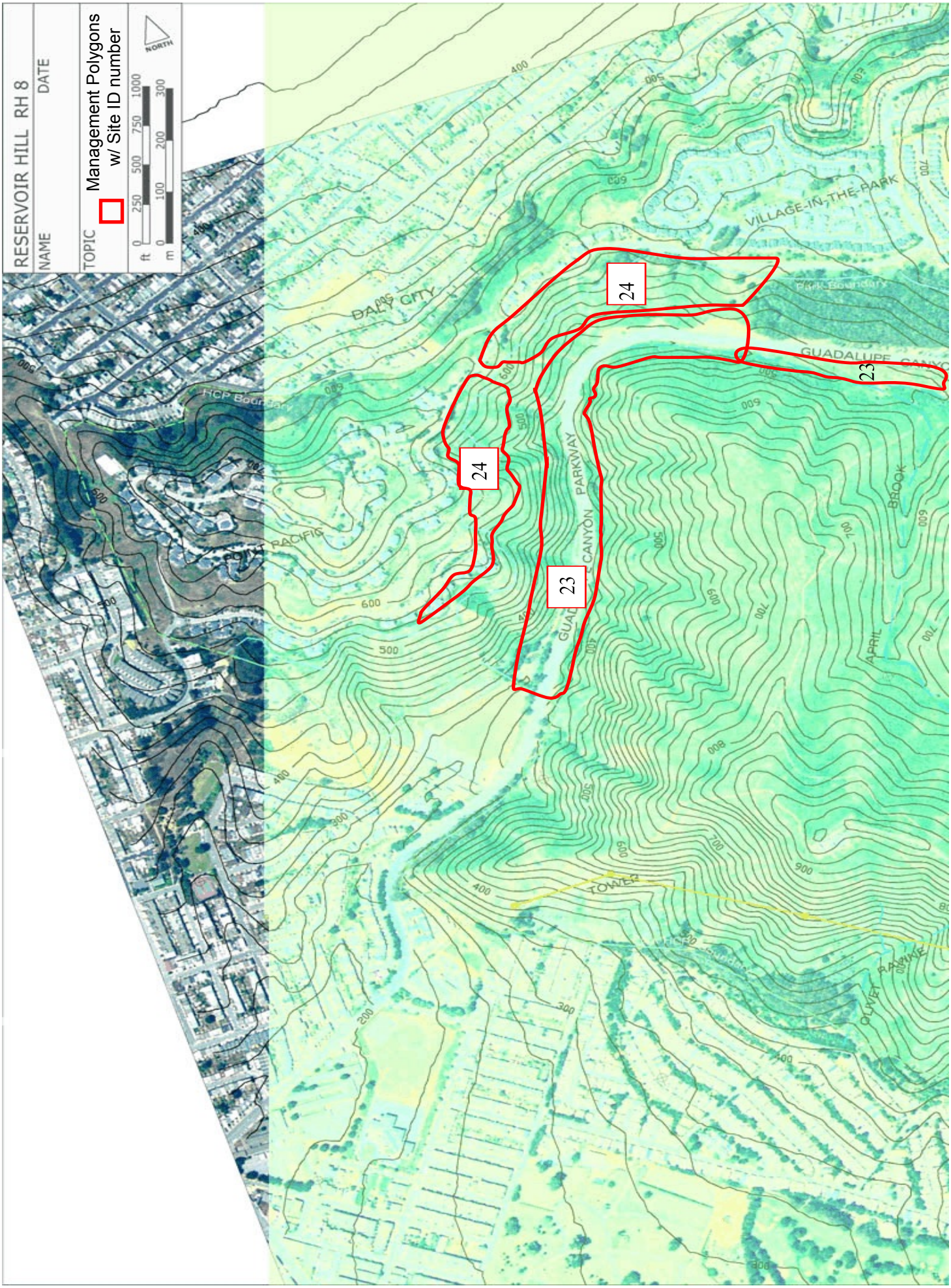


FIGURE 11: Reservoir Hill

FIGURE 12: Saddle Trail

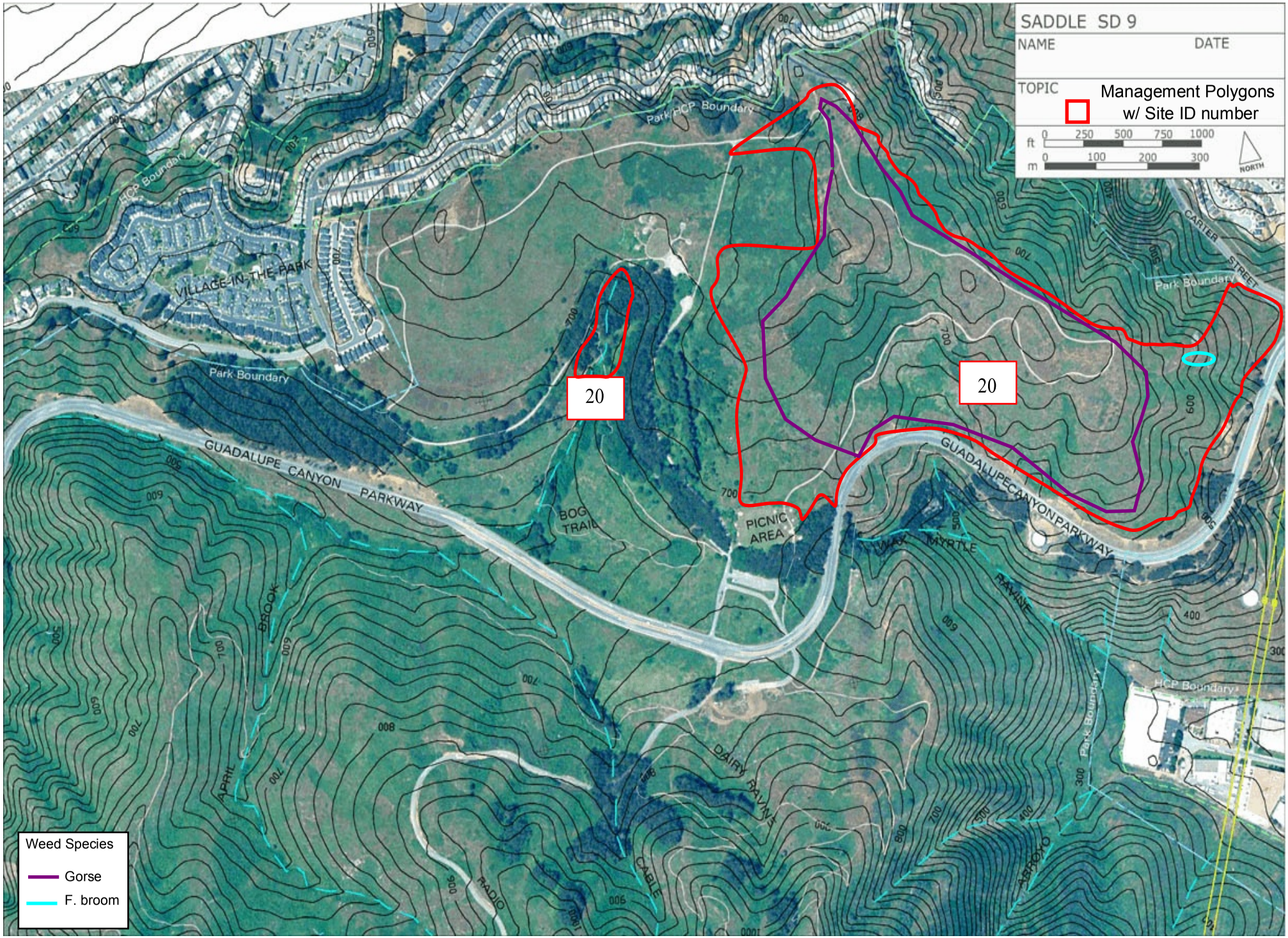


FIGURE 13: Wax Myrtle Ravine Coyote Brush Restoration Sites

Figure 14: Owl & Buckeye Coyote Brush Removal and Perennial Grass Re-seed Project

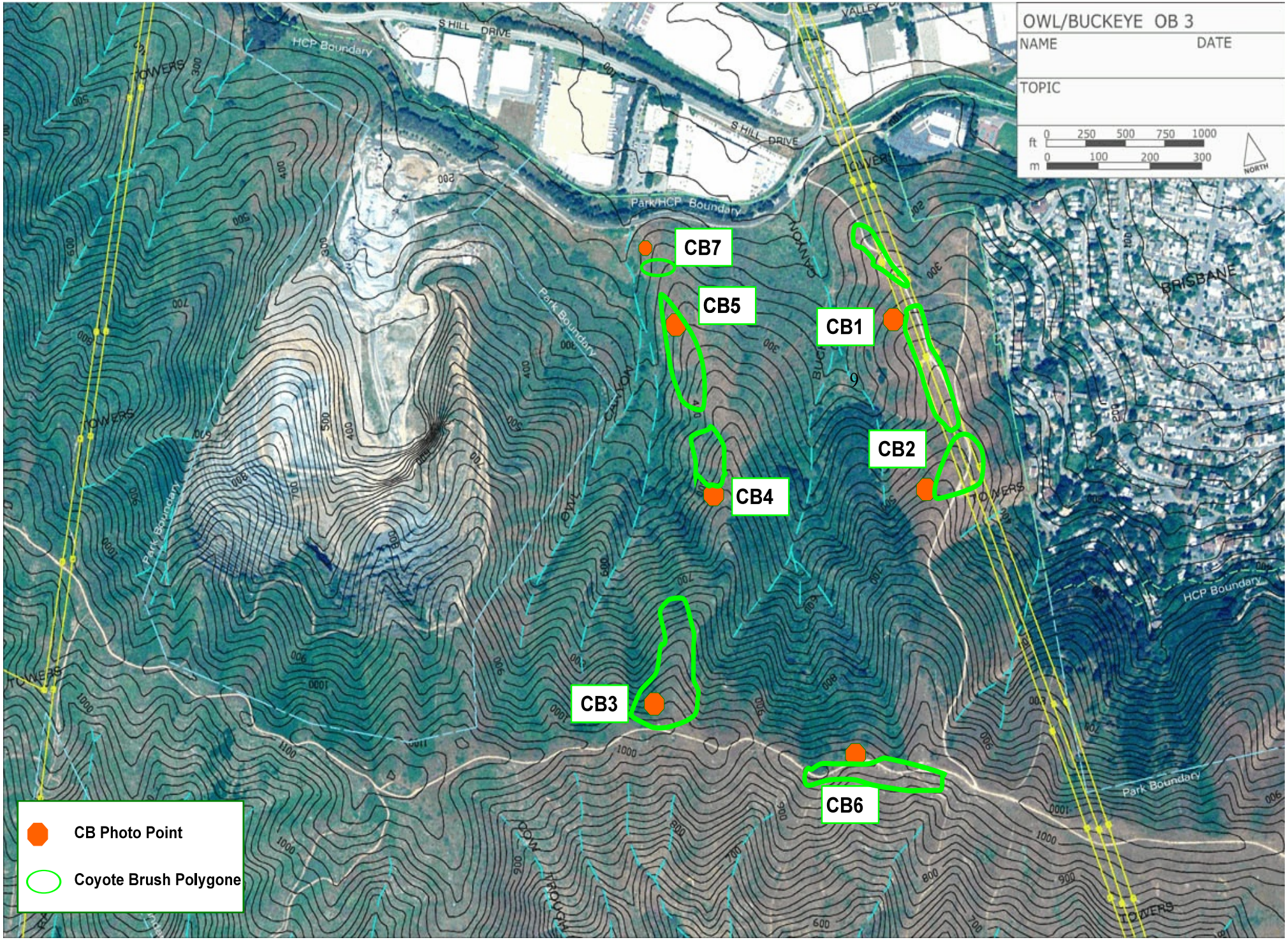


FIGURE 15: Oxalis Control and Restoration Sites

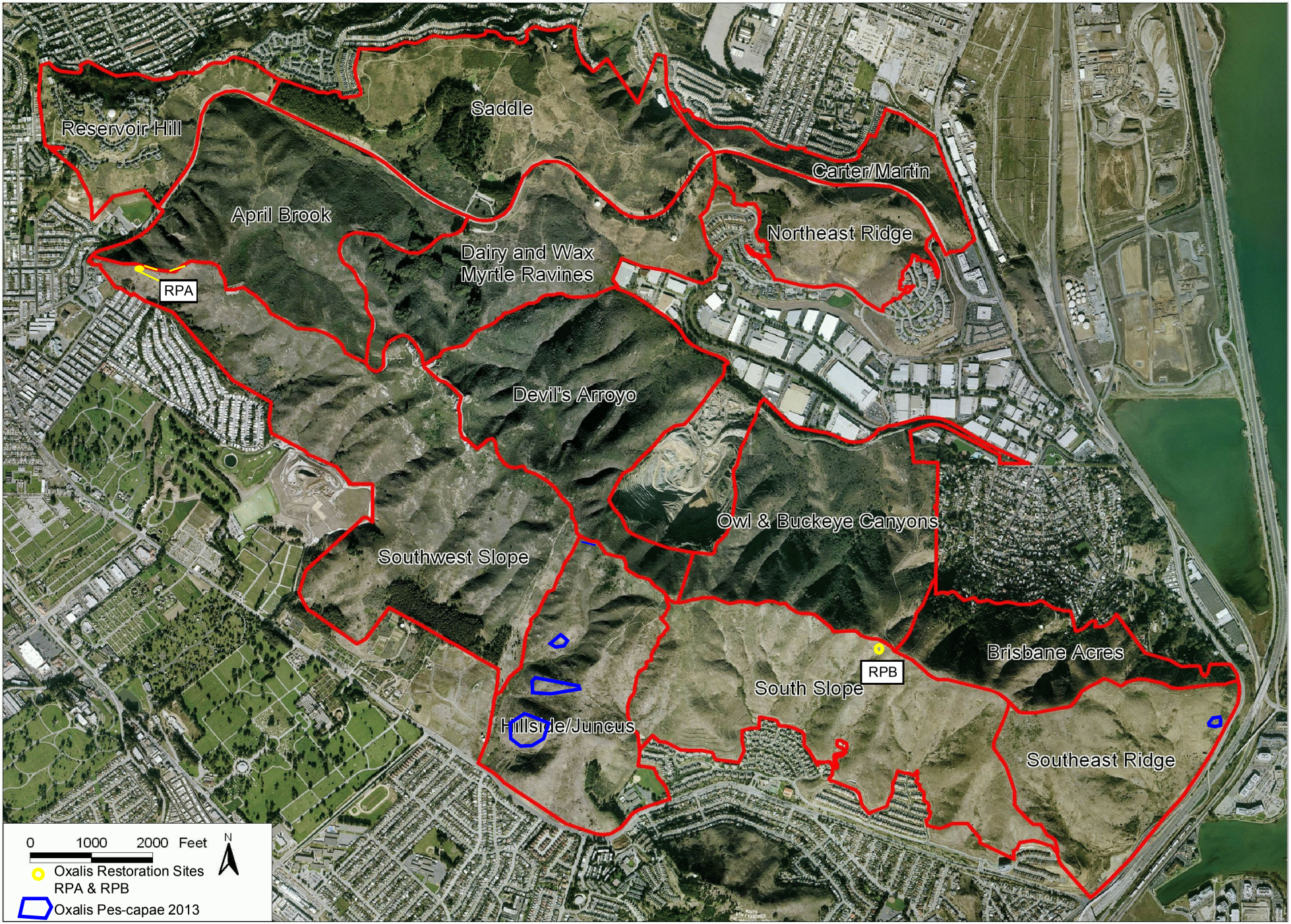


FIGURE 16: HTOL Management Units

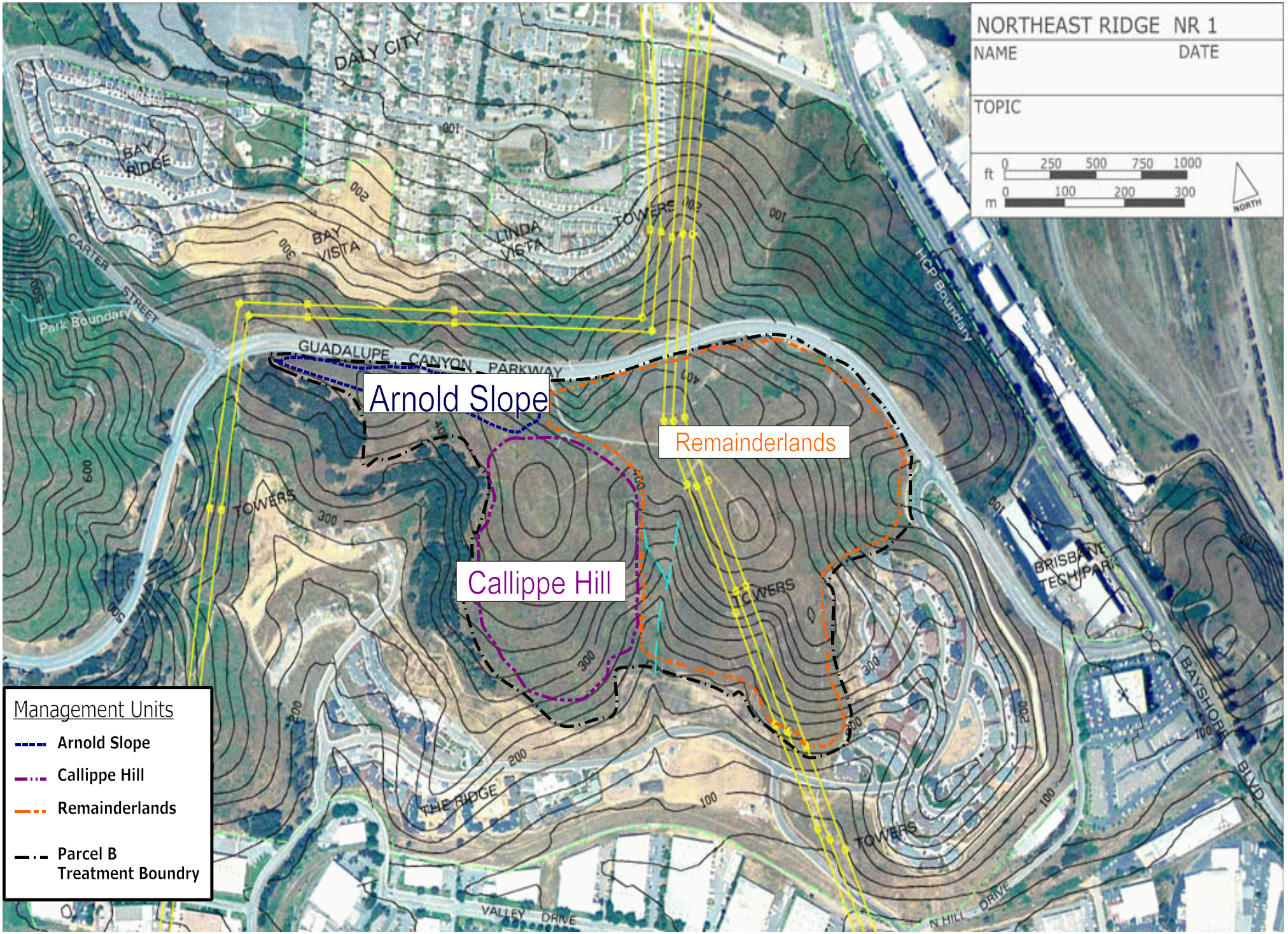


FIGURE 17: HTOL Weed Management Map