SAN BRUNO MOUNTAIN
HABITAT CONSERVATION PLAN

Year 2012 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
Public Works and Parks
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FINAL REPORT

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Report Prepared by:

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

Cover photo:
View of Lupuinus 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 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 over time, 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 2012 were conducted in accordance with the goals, objectives and success criteria established in the San Bruno Mountain Habitat Vegetation Management Plans during FY2011/2012 and FY 2012/2013. Priority areas for management of invasive species are delineated in the San Bruno Mountain Habitat Vegetation Management Plan.

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 Parks Department. 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 are as follows:

Priority 1: Small patches of invasive species within native habitat
Priority 2: Small patches of invasive species at the periphery of native habitat
Priority 3: Edges of large invasive species infestations
Priority 4: Large invasive species infestations

Selective Herbicides (labeled caution), garden tools, and hand pulling are the main methods 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 since it does not harm 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 pruning saw, chainsaw or mowing followed by cut stump herbicide application.

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 2012, emphasis was placed on those areas and weeds that threatened grassland butterfly habitat in areas previously managed and the addition of newly threatened habitat sites. As small isolated weedy populations or isolated individual species of concern are discovered they are noted on the daily data sheet and WCW either diverts funds to treat these species when possible, or the plants are monitored and identified for control in the following year's budget. Only with continued follow-up treatment and maintenance can an invasive infestation be managed.

In addition, recommendations made by the Technical Advisory Committee that meets quarterly (section IV. B below) are used to guide current and future weed control efforts. Two projects were initiated in FY2012/2013 because of the TAC meetings during the year. Both projects are a cooperative effort between WCW Inc. and the San Bruno Mountain Watch volunteers. The first is coyote brush (*Baccharis pilularis*) removal along the Main Ridge Trail and Owl/Buckeye Sub Ridges followed with native perennial grass reseeding. The second is planting endangered butterfly host and nectar plants within oxalis treatment sites where Mission blue butterflies are observed during the annual monitoring schedule.

I. INTRODUCTION

In 2012, 670 acres of invasive plants were treated using hand control, mechanical tools, and herbicide applications (Figure 2). The majority of the acres treated were visited 2 to 3 times for 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 2012 (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 (previously Himalayan blackberry)(*Rubus armeniacus*), jubata grass (*Cortaderia jubata*) and oxalis

(*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. *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. These areas are considered prime habitat for the Mission blue and Callippe silverspot butterflies. The monitoring and treatment sites added to this years scope included South East Ridge (Callippe silverspot habitat) and Preservation Parcel, an Ohlone Native American archeological shell mound site, both located at the eastern section of the park.

This same method was used on the newly acquired parcels (Figure 13) at the south-eastern grasslands in management units within the South Slope and the Southeast Ridge with the addition of 185 acres at Tank & Juncus Ravine and three parcels between The Woods and Mandalay Point Development along Sisters Cities Boulevard.

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 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 has expansive areas of grassland 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. Significant patches of Mission blue habitat are located along the ridge trail and on fire roads, rocky outcrops and slumps within the unit. The lower northern slope of this unit includes the Preservation Parcel.

The weeds of concern treated during 2012 using hand pulling, brushcut or mow and herbicide applications methods were cotoneaster (*Cotoneaster* ssp.), fennel (*Foeniculum vulgare*), summer mustard (*Hirschfeldia incana*), wild radish (*Raphanus ssp.*) and French broom (*Genista monspessulana*). The species density was highest in fennel, wild radish, and summer mustard along the Ridge Trail. French broom had two sites that totaled three square meters and the *Oxalis pes-caprae* maintains similar coverage but density has been reduced by ~15%. The Preservation Parcel is one of the areas added to the aggressive oxalis treatment sites.

B. Brisbane Acres (152 acres)

The Brisbane Acres management unit 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.

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*).

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 contains a PG&E easement and is crossed by San Francisco Water District water supply lines.

The weeds of concern treated during 2012 using hand work, brushcut, and mow 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 species density was highest in 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.

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 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 2012 using hand work, mowing and herbicide applications methods were Birstly 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.

D. Owl/Buckeye Canyon (294 acres)

The Owl and Buckeye Canyons management unit 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 2012 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.

Hand removal of French Broom took placealong the lower draw of Buckeye Canyon around San Bruno Mountain Watch re-vegetation sites, and within a large patch of dense French Broom adjacent to the planting sites. This effort was follow up treatment to vegetation maintenance after initial foliar and basal bark herbicide application in 2010.

The new 2011 patch of *Oxalis pes-caprea* located west of Owl Canyon was included in the latest Habitat Management Plan. The site was treated in late December.

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. The Ridge Trail and the north facing sub-ridges are now part of the Coyote Brush Reduction and Grassland Re-seeding Projects.

West Coast Wildlands' crew cut 312 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. Joe Cannon, of San Bruno Mountain Watch, hand broadcast native perennial grass seed within the previous brush canopy. The sites were mapped by GPS and photo station points were established for annual monitoring.

E. Northeast Ridge (214 acres)

The Northeast Ridge 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 2012 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 Toll Brothers, Inc., have agreed to dedicate Parcel B at the Northeast Ridge to San Mateo County 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 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 treated during 2012 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. Management of French broom is primarily maintained by hand removal surrounding these plants.

G. Hillside/Juncus Ravine (217 acres)

The parcel 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 needlegrass 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.

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*) present in isolated patches are treated during the winter months prior to flowering and through the month of February (Figure 16).

H. Devil's Arroyo (268 acres)

Devil's Arroyo 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 ridgeline 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 the basal bark or thinline treatment. Weeds within the buffer zone are hand removed using a polaski or weed wrench hand tool.

I. Dairy and Wax Myrtle Ravine (214 acres)

Dairy and Wax Myrtle Ravines 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, 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. Over 30 acres of the site was logged in 1995, and restoration work has been focused on returning this area to native habitats. Important habitat for Mission blue, Callippe silverspot, and San Bruno elfin is found in 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. A controlled burn that escaped fire lines resulted in a wildfire that burned 72.5 acres of this unit in July 2003. The burn has significantly improved the condition of this management unit by removing dense stands of gorse and eucalyptus slash, which has provided access into the ravine for management crews.

Our focus of control has been on eucalyptus, gorse, Armenian blackberry, French broom, jubata grass, and oxalis throughout the unit, as well as the Coyote Brush Removal Project along the Nine-fern Rock sub-ridge. The Coyote Brush stumps were treated with a 25% solution and the surrounding area was re-seeded with a native perennial grass. 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% Trichlopyr herbicide. The eucalyptus is then left to decay onsite.

The subridge 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 was cut with loppers and hand saws and treated with a 25% solution of Garlon 4 Ultra. Native grass seeds were hand broadcast into removal areas by Joe Cannon of San Bruno Mountain Watch.

J. Southwest Slope (436 acres)

Southwest Slope 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 Cypress AMLOC landfill, the Cypress golf course,

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 on fire roads along ridgelines. This unit has only very small patches of habitat for the San Bruno elfin and Callippe silverspot butterflies.

The weeds of concern managed during 2012 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.

K. April Brook (273 acres)

The April Brook management area 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.

The maintenance efforts have changed to two visits per year for weed control due to reduction of the seed bank. Forty cotoneaster shrubs were removed at the eastern end of the site where *Lupinus formosus* is present. The stumps were treated with a selective herbicide. The yellow star thistle (*Centauria solstitialis*)

found in 2007 is still absent from the site.

L. Saddle (320 acres)

The Saddle 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. Additional species observed were jubata grass that was treated with an aquatic herbicide and eucalyptus seedlings that were cut at the soil surface

M. Reservoir Hill (127 acres)

This management unit 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 (Figure 11). 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 existing butterfly habitat is maintained within portions of dune scrub and associated rare plant species. The weeds of concern we treated were bristly ox-tongue, fennel, iceplant, summer mustard, wild radish, oxalis, and French broom. The species density was highest oxalis, ice plant *(Carpobrotus edulis)*, and summer mustard along the roadside while the French broom, summer mustard, and fennel were scattered along the southern section adjacent to the residential properties. A 1M polygon of gopher spurge seedlings (*Euphorbia lathyrus*) in Pointe Pacific was treated reducing the seed bank present in the soil. The gopher spurge originally covered an area of approximately 1000 sq. ft (at approximately 1 % density) and was treated twice with 2% Garlon4 Ultra in the spring of 2012.

III. ADDITIONAL TASKS

A. HCP Oxalis Control Project

As part of the 2005/2006 HCP fiscal year budget, special funding was approved for aggressive control of Oxalis (*Oxalis pes-caprae*). 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 16).

The funding for oxalis control was approved for 2012/2013 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 new 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 management areas.

Oxalis is also 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). Other smaller infestations (Dairy Ravine, Radio Road, and below Brisbane Water Tank) are already treated as part of the general budget and work plan.

Approximately 15 acres have been treated this year with small pockets emerging mainly on to south facing slopes of San Bruno Mountain.

Some of the areas that have been controlled of oxalis have been colonized by coyote brush and wild oat. An assessment made by WCW, Inc., in December 2012, detected oxalis not present the previous year had emerged after the increased rainfall during the Fall months. The infestation had an increased ground cover of 25% after the previous year's absence. Either the 2011 drought restricted emergence of the oxalis is some areas treated in 2010 or the plant bulblets appear to senesce longer than one year. All treatment sites are GPS

mapped following an application

B. Owl and Buckeye Canyons Wildland Burn Site Coyote Brush Removal Project and Native Perennial Grass Re-seeding

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 the larger (> 2 in DBH) brush removed by chainsaws and 2) Foliar application to secondary growth on smaller plants (<2 in. DBH).

There are six additional photo stations in place for the coyote brush removal. The photo stations are label as CB1-6 and the brush removal plots are highlighted in green (Figure 15).

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 (Figure 17:, 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 an 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 brushcut to remove fennel seed stalks during the late Spring removing dead material to expose weedy root stems and initiate

secondary growth and the emerging leaves treated with herbicide in early Fall 2012. 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. There is a 99% reduction of mature fennel 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 (Figure 18: Office & Buffer Parcels) and the treated area consists of 15 acres.

The Mandalay Point property managers, Wilson, Meeny & Sullivan, LLC, accepted an bi-annual maintenance program to remove additional weeds to be funded on an annual basis. This initial and follow-up treatment continued through the Fall 2012. The current status of weed control is a 99% reduction of the primary mature weed species.

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*).

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 of about 8 people come out once a week to plant seeds, tend plants, and general maintenance. A total of 554 hours were spent at the native plant nursery.

Volunteer Hours.

In all three programs, there were 601 SBMW volunteer visits to the mountain, resulting in 1775 hours of work.

The volunteer planted native species (Table 3) at Owl and Buckeye canyons and

the Saddle Bog area.

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 20) controlling french broom, fennel, Italian thistle, wild radish, summer mustard, and eucalyptus seedlings (Figure 21).

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.

Follow up treatments will continue in the spring of 2013 to spray emerging regrowth of cut fennel, the summer mustard and wild radish that may volunteer or germinate within the habitat treatment areas.

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 Parks Department.

B. HCP Habitat Islands

Since 1995, several habitat restoration islands have been created and managed within former eucalyptus and gorse sites in the HCP conservation area by Shelterbelt Builders. Inc. The planting islands are one of our tools in restoring habitat for the endangered butterflies. The islands are currently self maintained at Colma Creek (CC1) dairy Ravine (D1 & D5), N.E. Ridge Burns Sites (NER1 & 2) and N.E. Ridge Planting island (NERPI 3-6, 7a & 7b).

C. Colma Creek & Saddle Bog Trail Watershed Project

Under a state grant managed by the County of San Mateo, the Watershed project

was carried out by “Heart of the Mountain”, led by Joe Cannon. The goal of the project was to restore the Colma Creek Headwaters to a native riparian plant community. The project was completed in 2009, with follow-up activities by Joe Cannon and volunteers. In January and February, 2011, an additional 250 native plants were planted.

In the Fall of 2009 San Bruno Mountain Watch received a grant from the National Fish and Wildlife Foundation to do habitat restoration along the Bog Trail.

Under the direction of Joe Cannon, volunteers have removed invasive plants, including common velvet grass, Armenian blackberry, summer mustard, wild radish, Italian thistle, and poison hemlock from along the trail and began planting native plants in their place, protected by a thick layer of weed free rice mulch. Planting continued through the winter of 2011-2012 (Table 3). The project is currently managed by the San Mateo County Parks Department through the San Bruno Mountain HCP Vegetation Management Plan and San Bruno Mountain Watch volunteer program.

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 21).

The Oxalis is treated during the December/January months and SBMW will be planting 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.

E. Grazing and Burning

No grazing or burning projects were conducted on San Bruno Mountain in 2011. Burning and grazing are identified as important habitat management tools in the San Bruno Mountain HCP and the San Bruno Mountain Habitat Management Plan, 2011. A Control Burning project as part of the Vegetative Management Plan (VMP) being formulated by the Habitat Manager and is proposed for implementation within the County Park in the near future.

VI. [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 Parks Department, 2011. San Bruno Mountain Habitat Management Plan 2011. Prepared by West coast Wildlands, Inc..

San Mateo County Parks Department. 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 Parks Department. 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. December, 2011. San Bruno Mountain Activities Report for Special -Status Species 2011: Prepared by TRA Environmental Sciences: Autumn Meisel.

All San Bruno Mountain HCP documents/ resources available on-line at http://www.traenviro.com/sanbruno/ or from County of San Mateo Parks Department.

TABLES

The following invasive plant species were treated in 2012:

Table 1. Invasive Species treated on San Bruno Mountain by West Coast Wildlands in 2012.

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. Additional Invasive Species treated on San Bruno Mountain in 2012 by volunteer groups.

Avena spp. (wild oat)	*Hypochaeris radicata* (hairy cat's ear)
Briza maxima (quaking grass)	*Lactuca serriola* (prickly lettuce)
Bromus hordeaceus (soft chess)	*Lobularia maritima* (Lobularia)
Cirsium vulgare (bull thistle)	*Lythrum salicaria* (purple loosestrife)
Ehrharta erecta (panic veldt grass)	*Plantago lanceolata* (plantain)
Erechtites arguta (New Zealand fireweed)	*Pyrocantha crenato-serrata* (pyrocantha)
Hedera helix (English ivy)	*Rumex crispus* (curly dock)
Holcus lanatus (velvet grass)	*Rubus armeniacus* (Armenian blackberry)
	Scabiosa atropurpurea (pin-cushion plant)

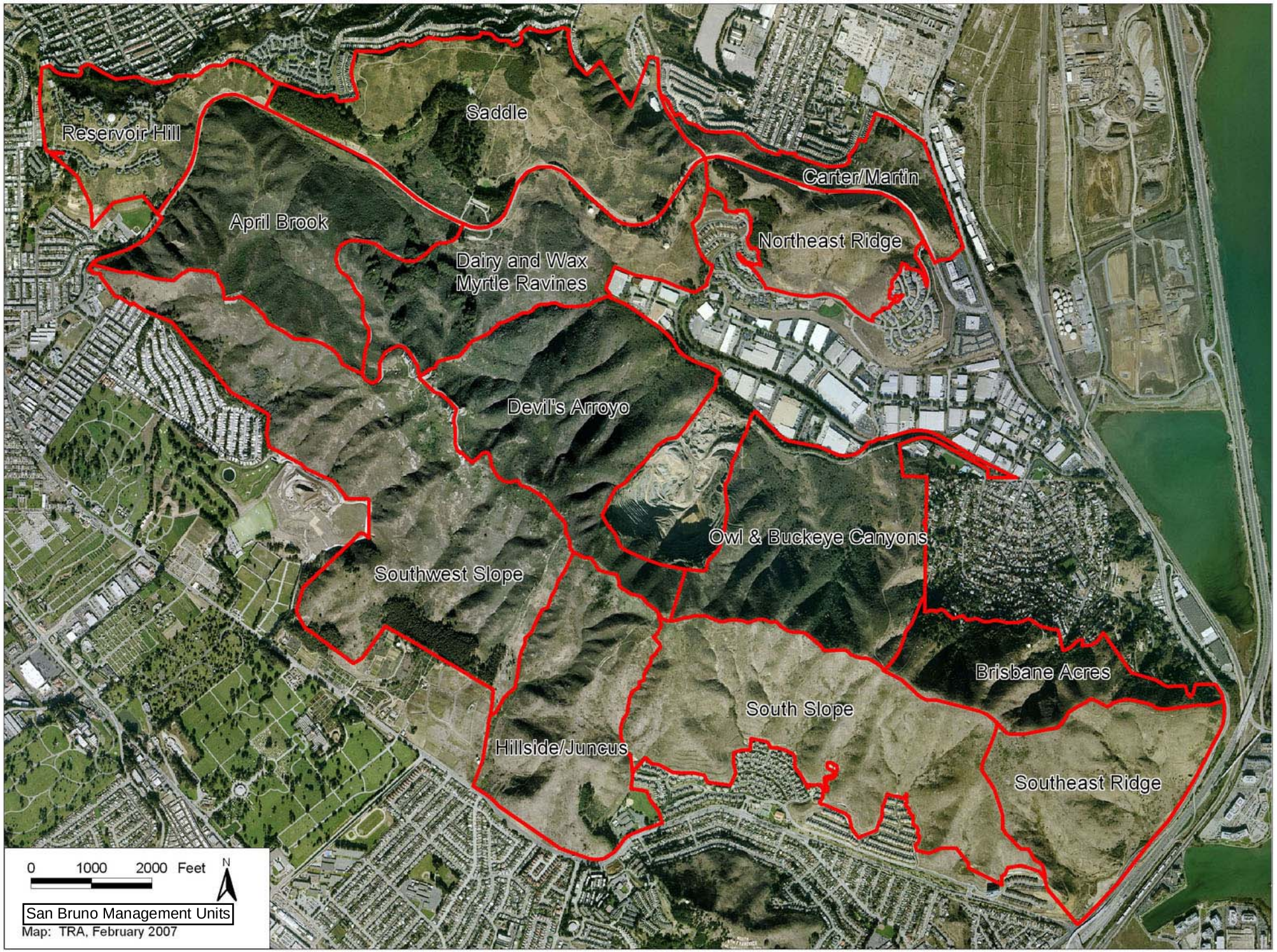
Table 3. Native Grass and Forb Species re-seeded within the Coyote Brush Removal area on San Bruno Mountain in 2012 by San Bruno Mountain Watch with West Coast Wildands, Inc.

	Common Name
Amsinckia intermedia	Fiddle Neck
Castilleja exsertapitosa	Annual Owl's Clover
Clarkia purpurea	Purple Clarkia
Clarkia rubicunda	Farewell to Spring
Daucus pusillus	Rattlesnake Weed
Lasthenia californica	GoldFields
Navarretia squareosa	Skunk Weed

Table 4. Additional Native Species Planted in the Saddle Bog area on San Bruno Mountain in 2012 by volunteer groups.

Deschanpsia caepitosa	*Isolepsis (scirpus) cernuus*
Dicondra donelliana	*Fragaria chiloensis*
Elymus glaucus	*Prunella vulgaris var. lanceolata*
Eriogonum staechadifolium	*Scrophularia californica*
Festuca californica	*symphytotrichum chilense*
	Tellima grandiflora

Figure 1. San Bruno Mountain HCP Management Units



San Bruno Mountain Hand & Herbicide Control Work 2012

FIGURE 2

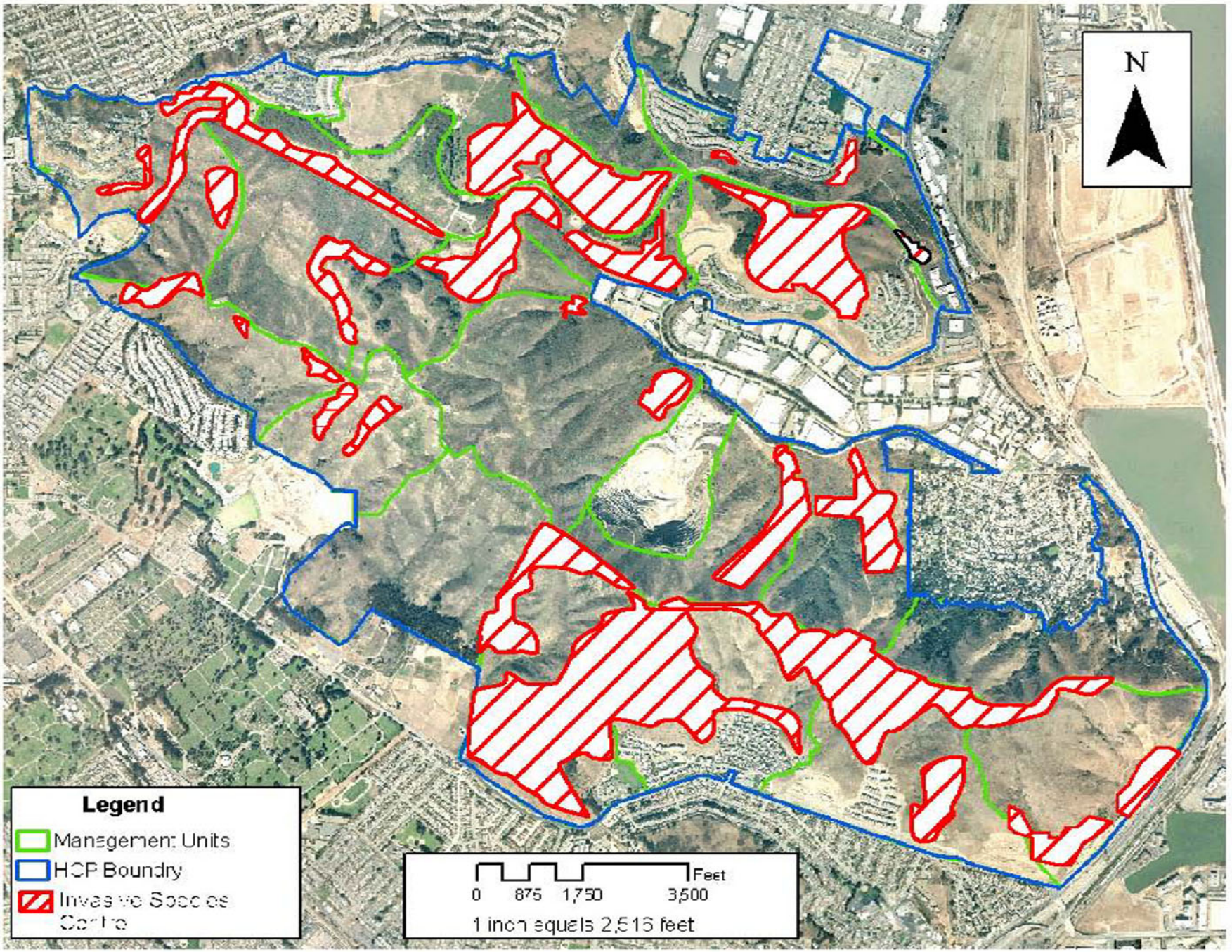


FIGURE 3: Daily Data Sheet

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

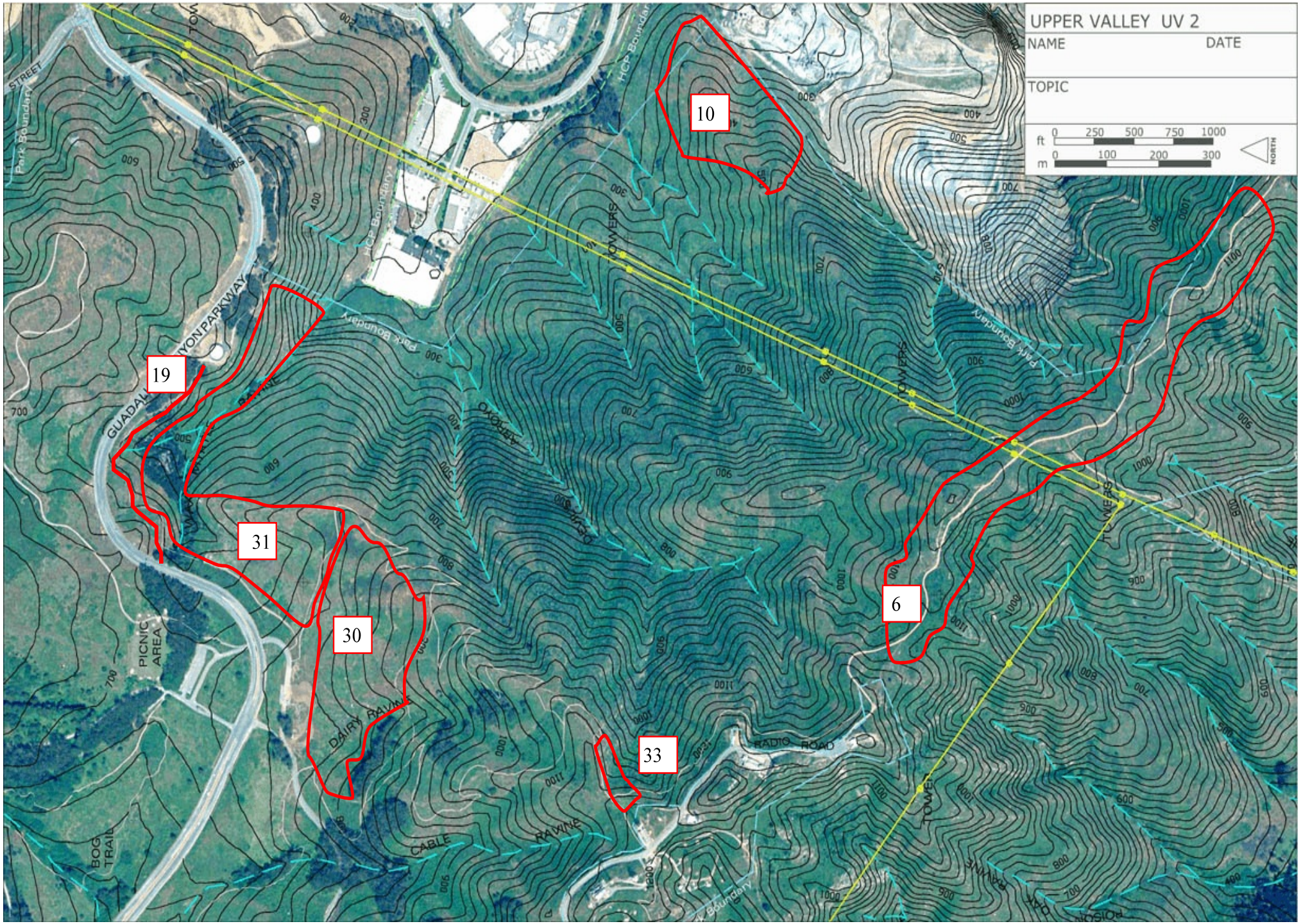


Figure 6: Owl & Buckeye Canyon

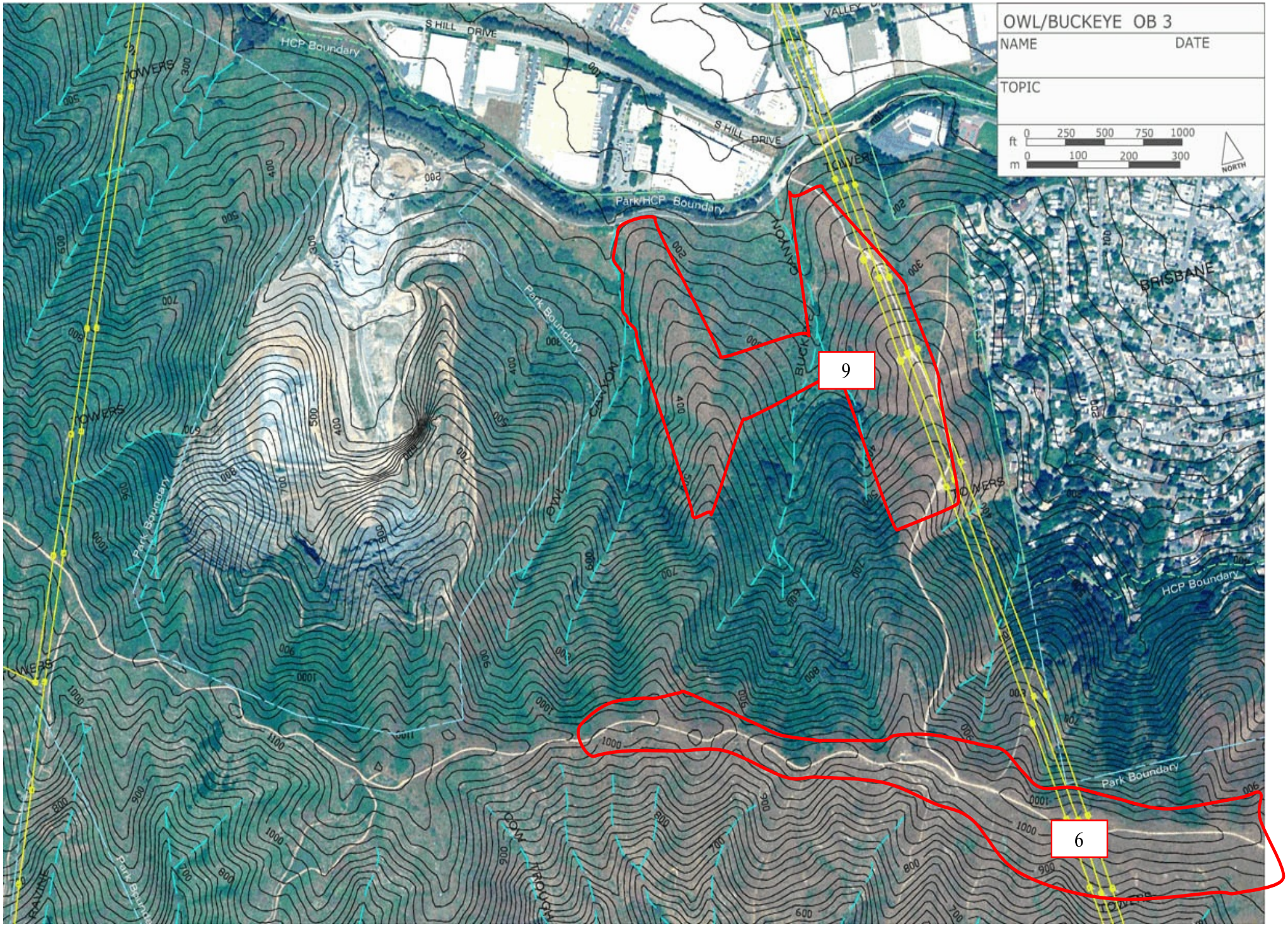


Figure 7: Southeast Ridge

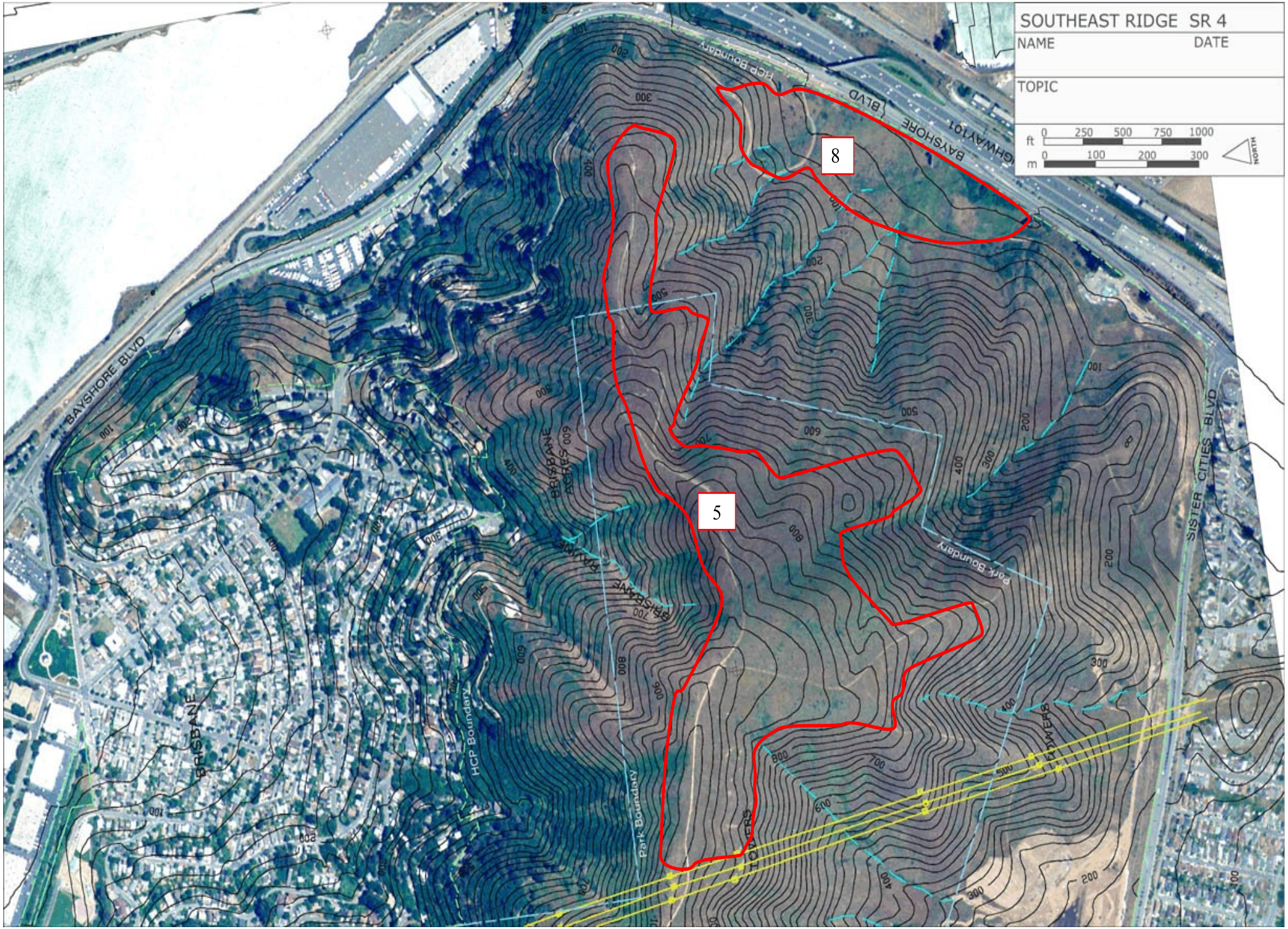


FIGURE 8: South Slope

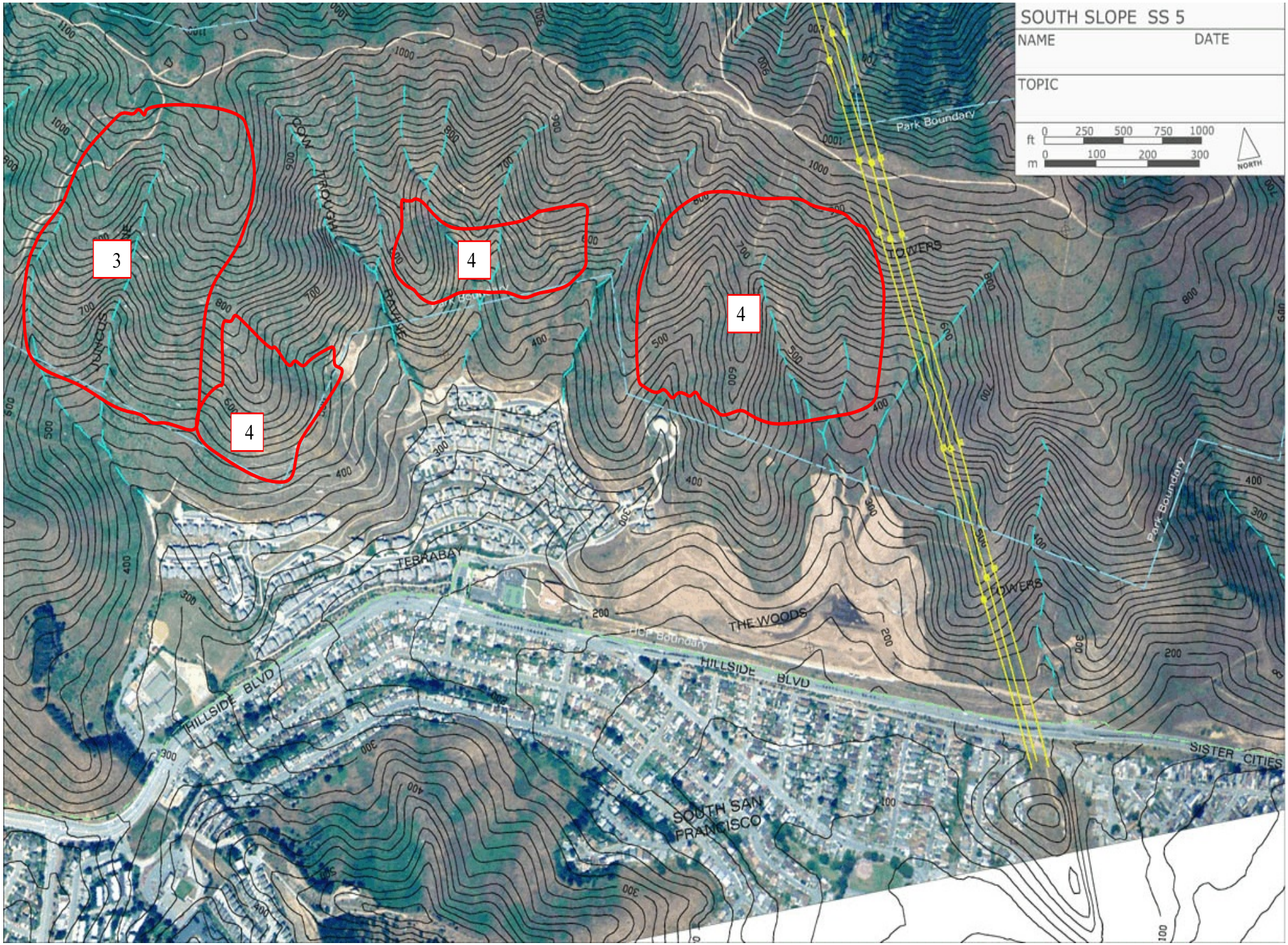


FIGURE 9: Hillside

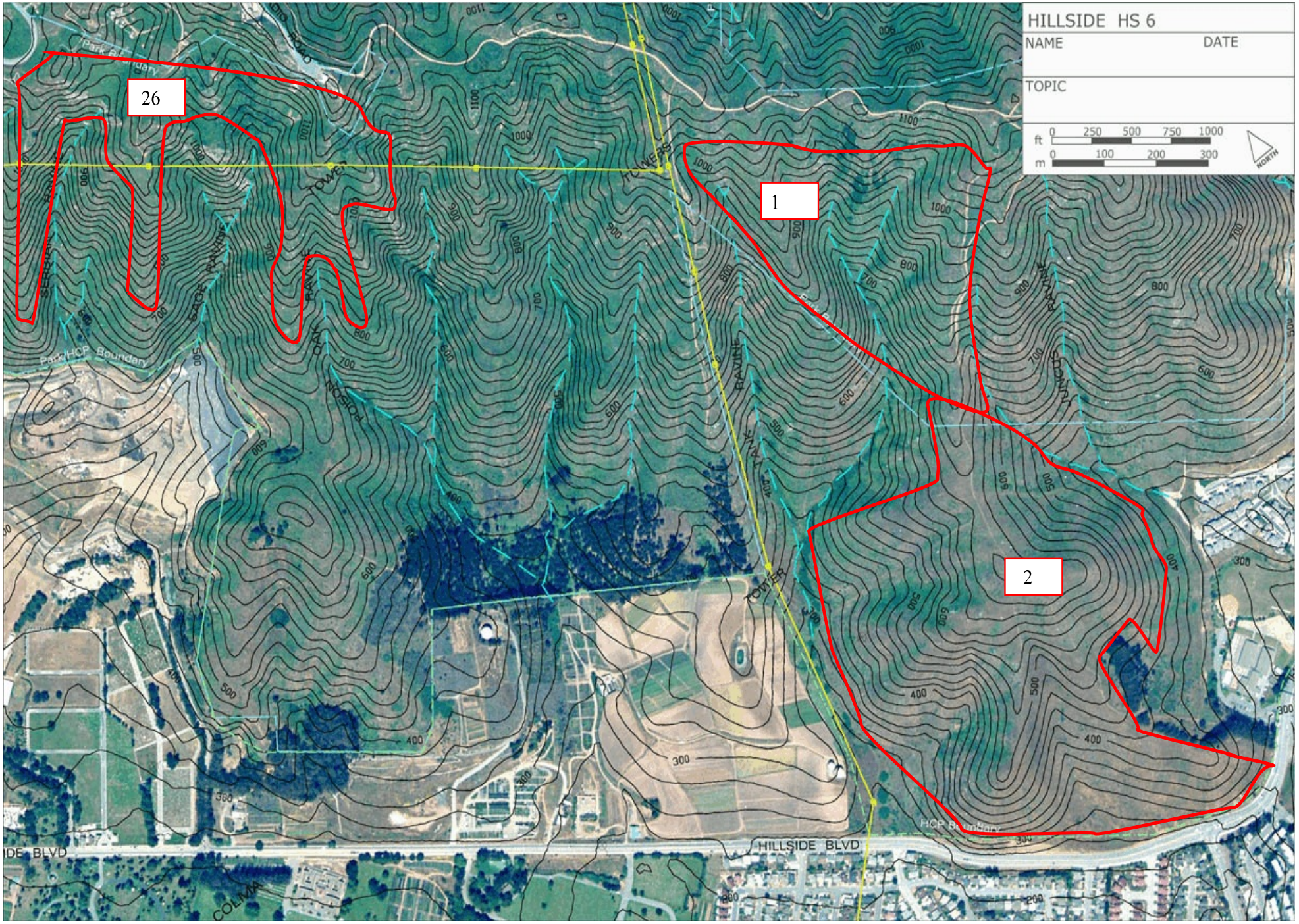


FIGURE 10: Radio Ridge

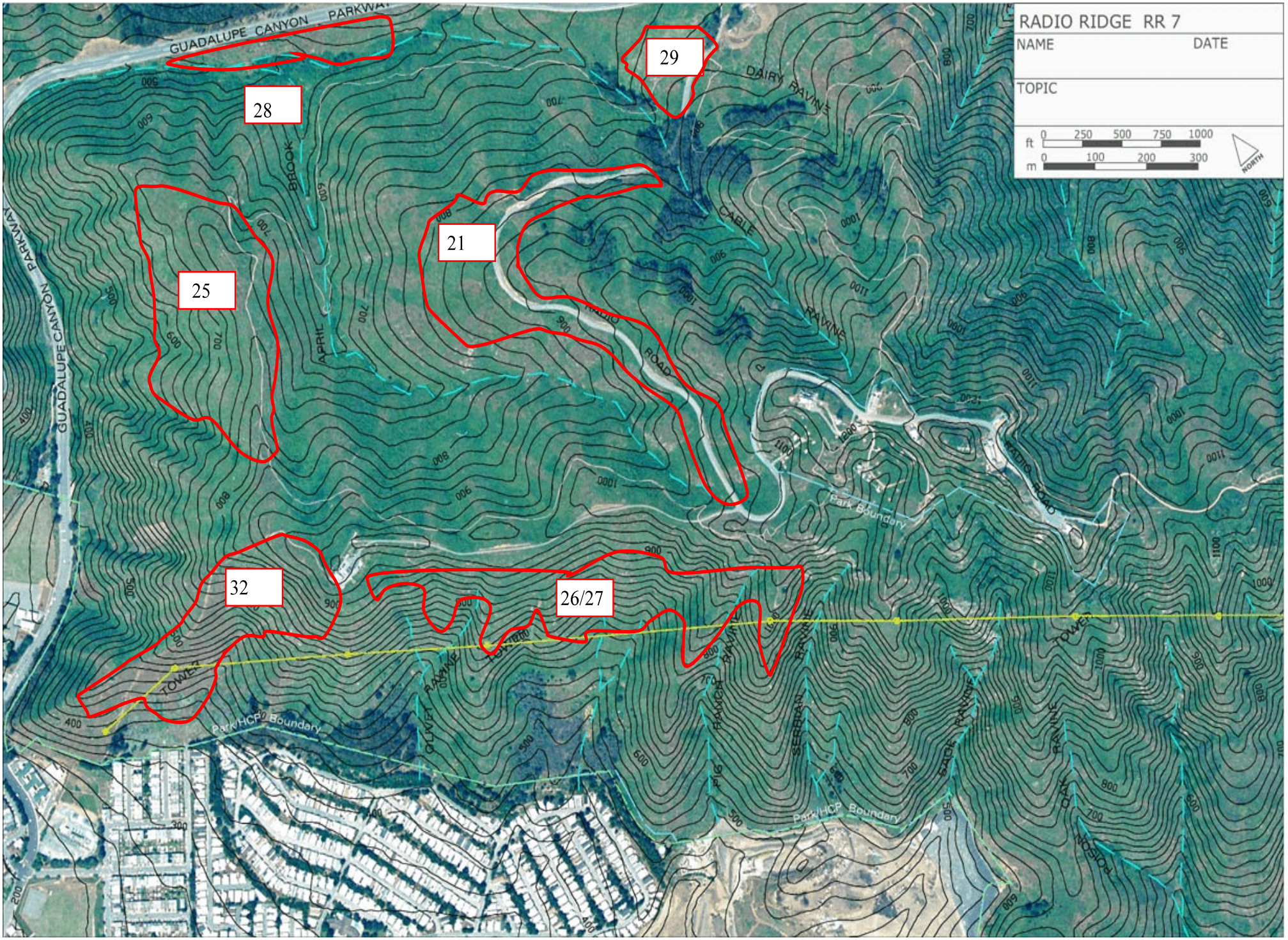


FIGURE 11: Reservoir Hill

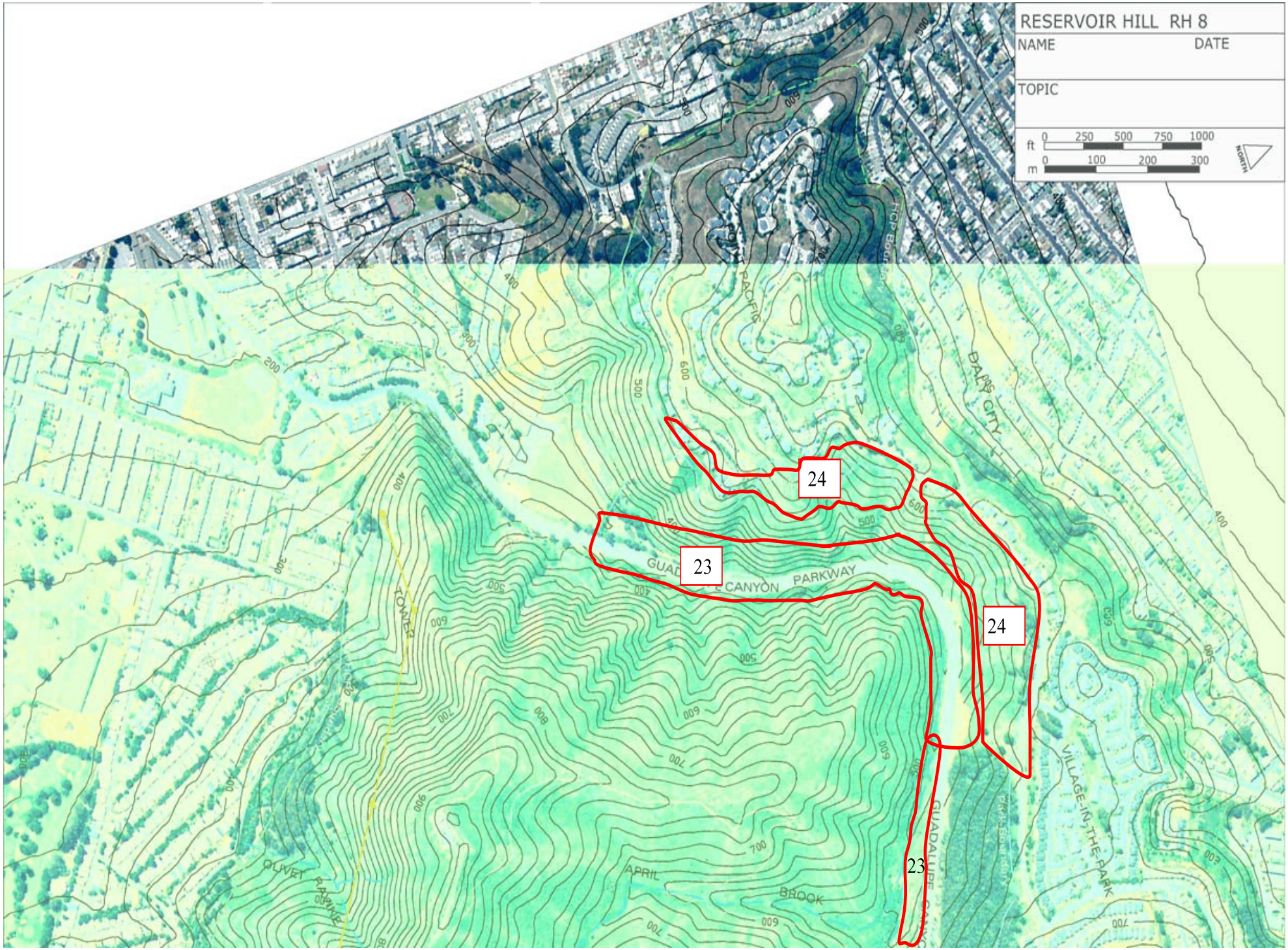


FIGURE 12: Saddle Trail

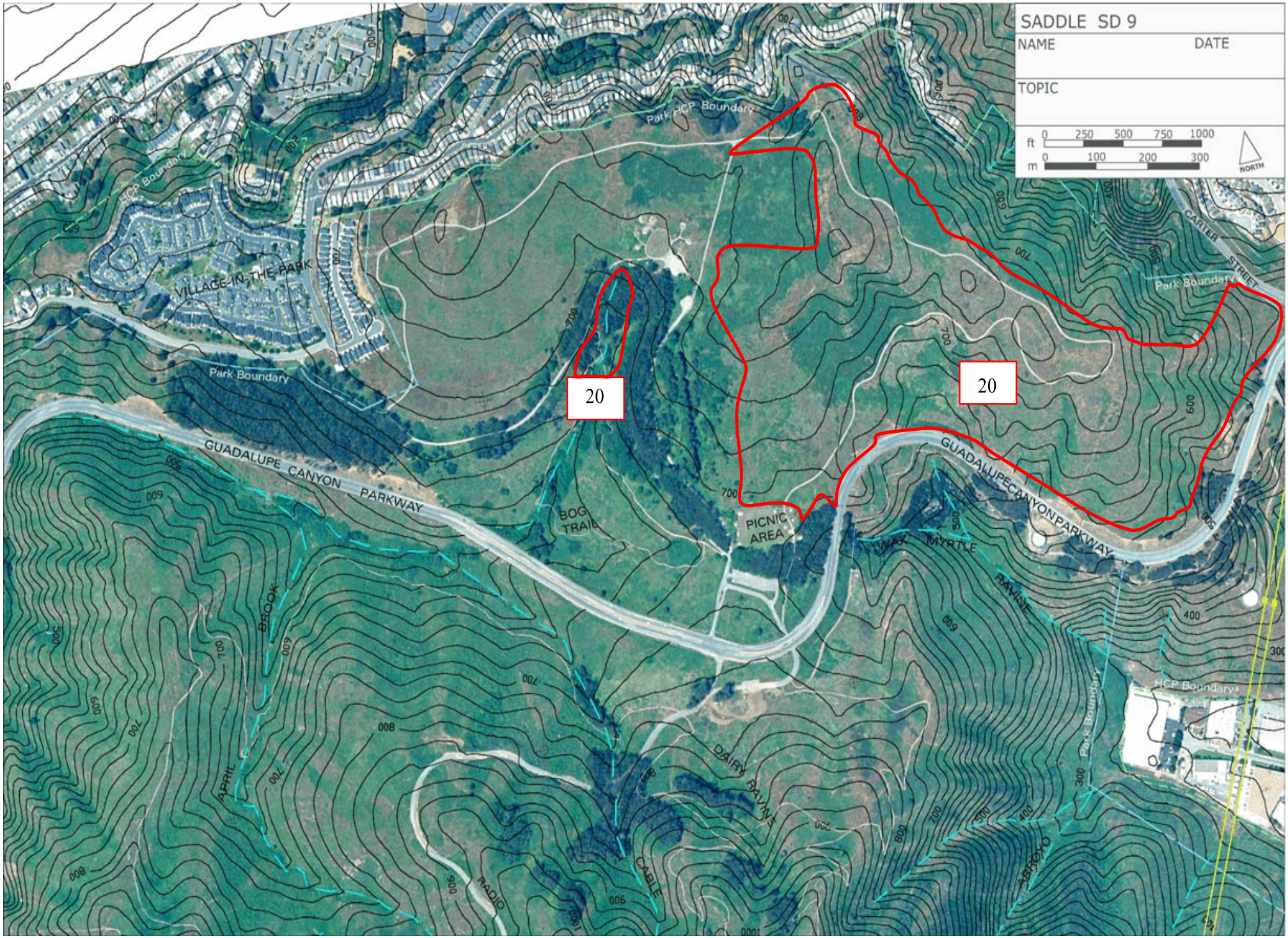


FIGURE 13: Dedicated Parcels 3-5, 22 & 23 to San Mateo County Parks Department

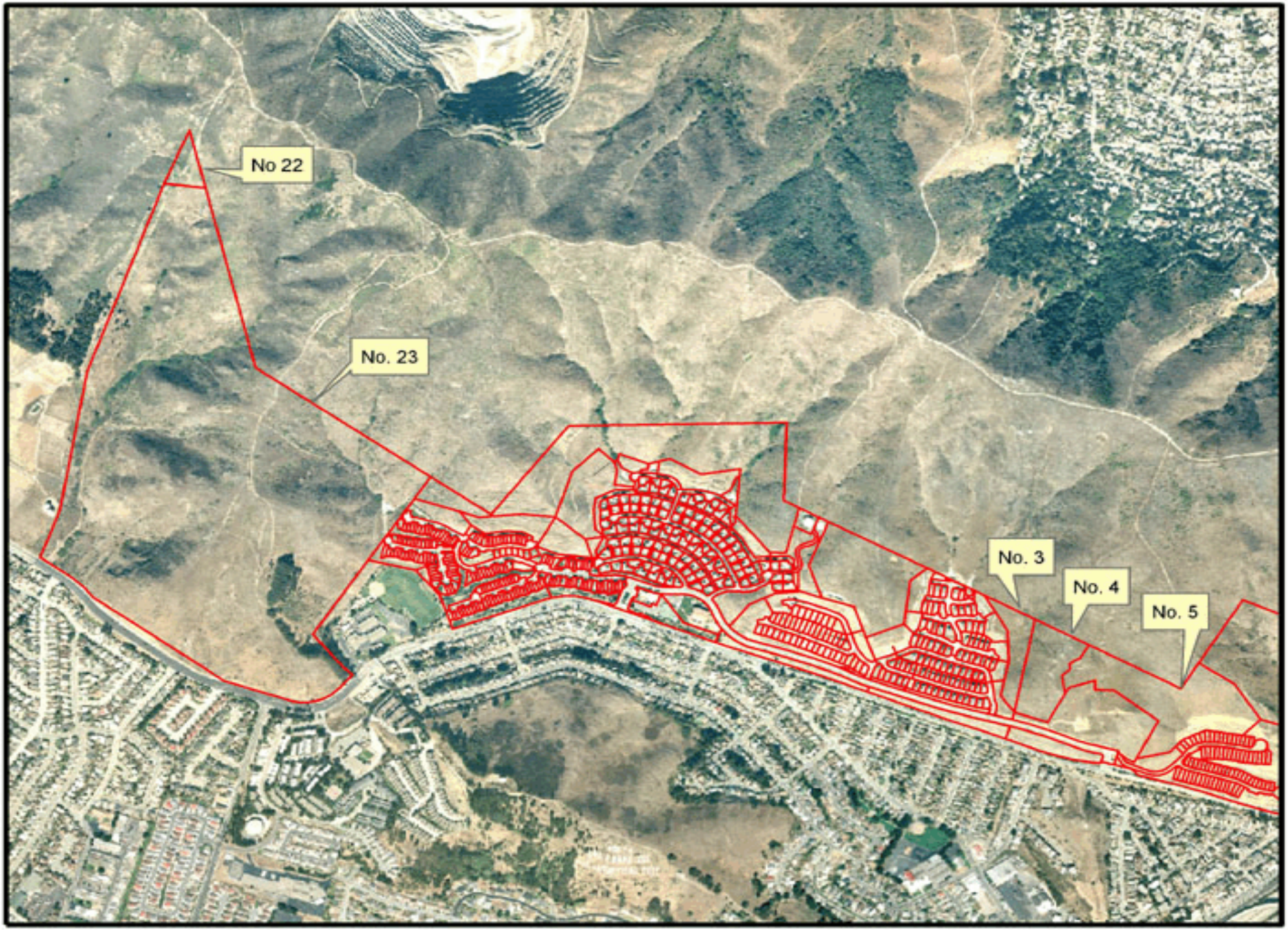


FIGURE 14: Owl & Buckeye Canyon 2008 Burn Site with Photo Stations

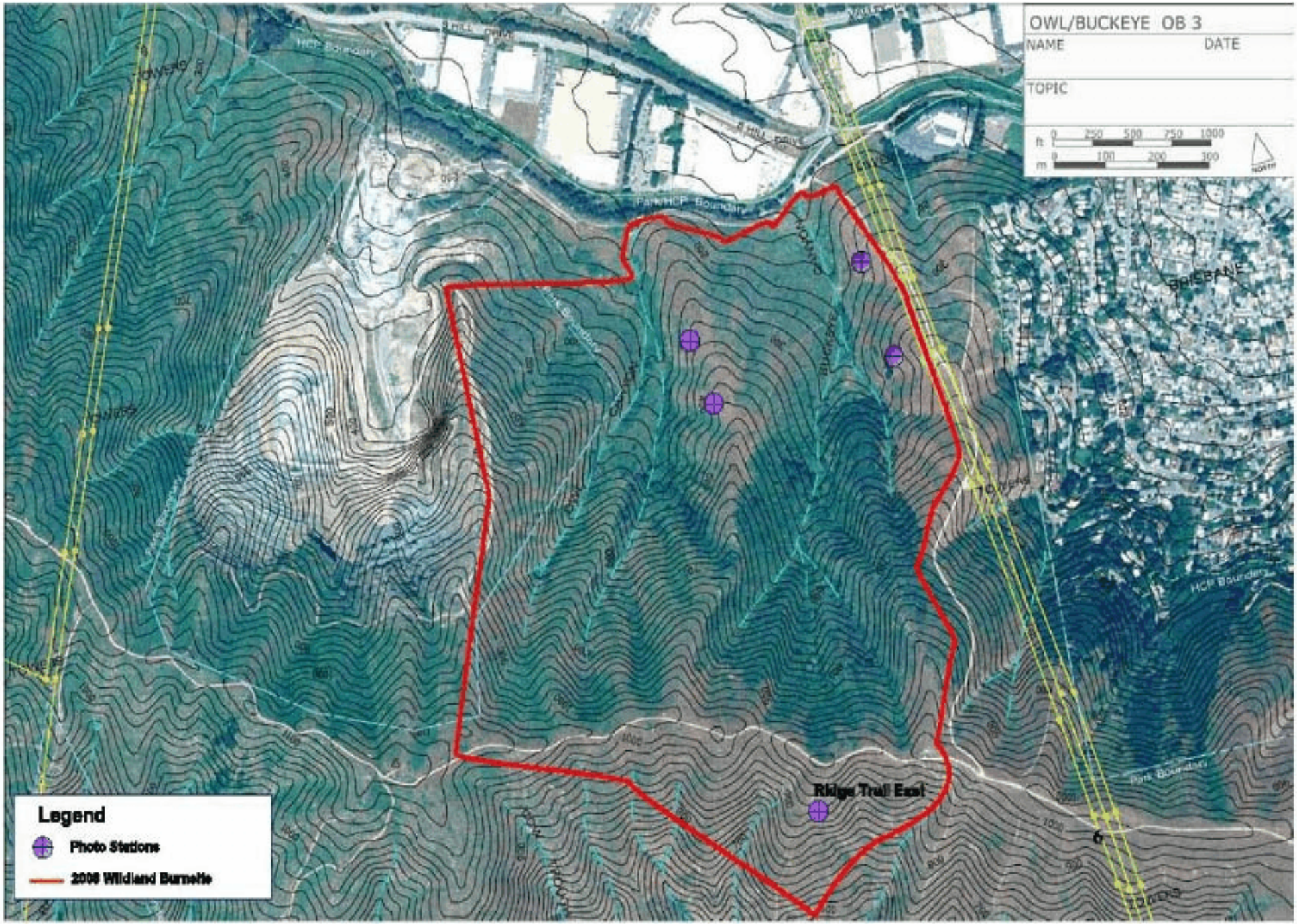


Figure 15: Owl & Buckeye Coyote Brush Removal and Perennial Grass Re-seed Project

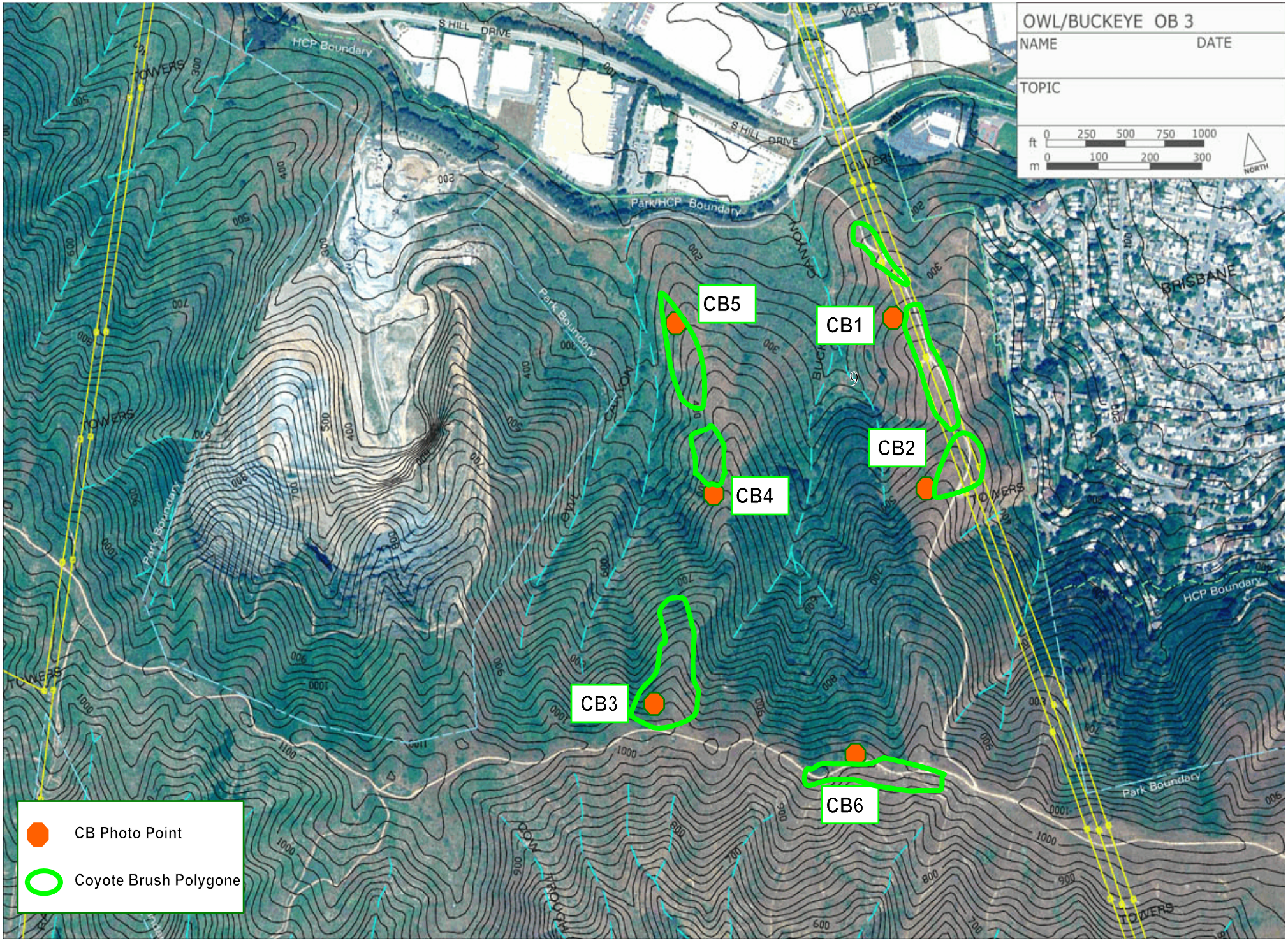


FIGURE 16: 2012 San Bruno Mountain Oxalis Pes-caprea Treatment and Mapping

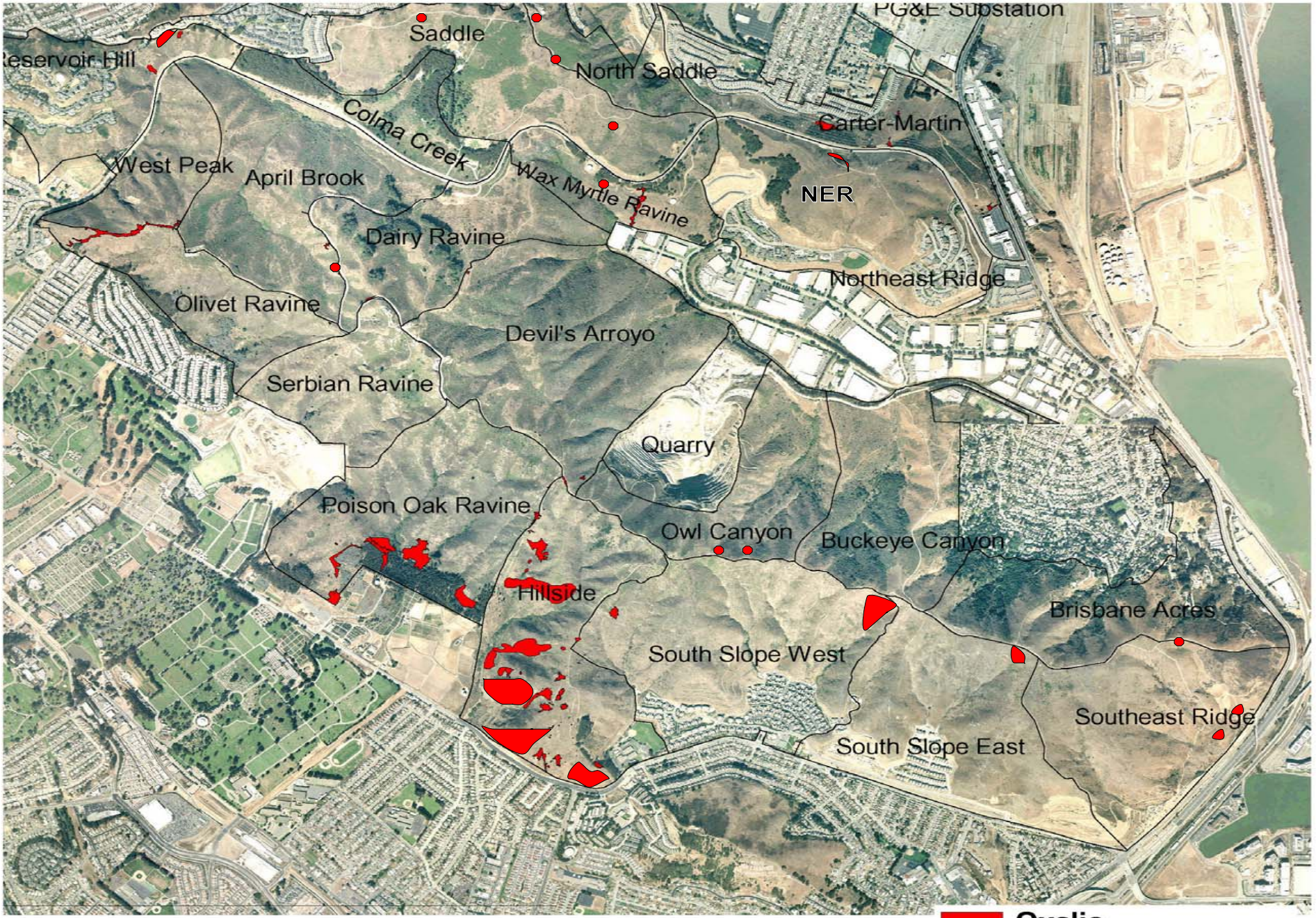


FIGURE 17: Terra Bay Masters HOA Exotics Treatment Parcels

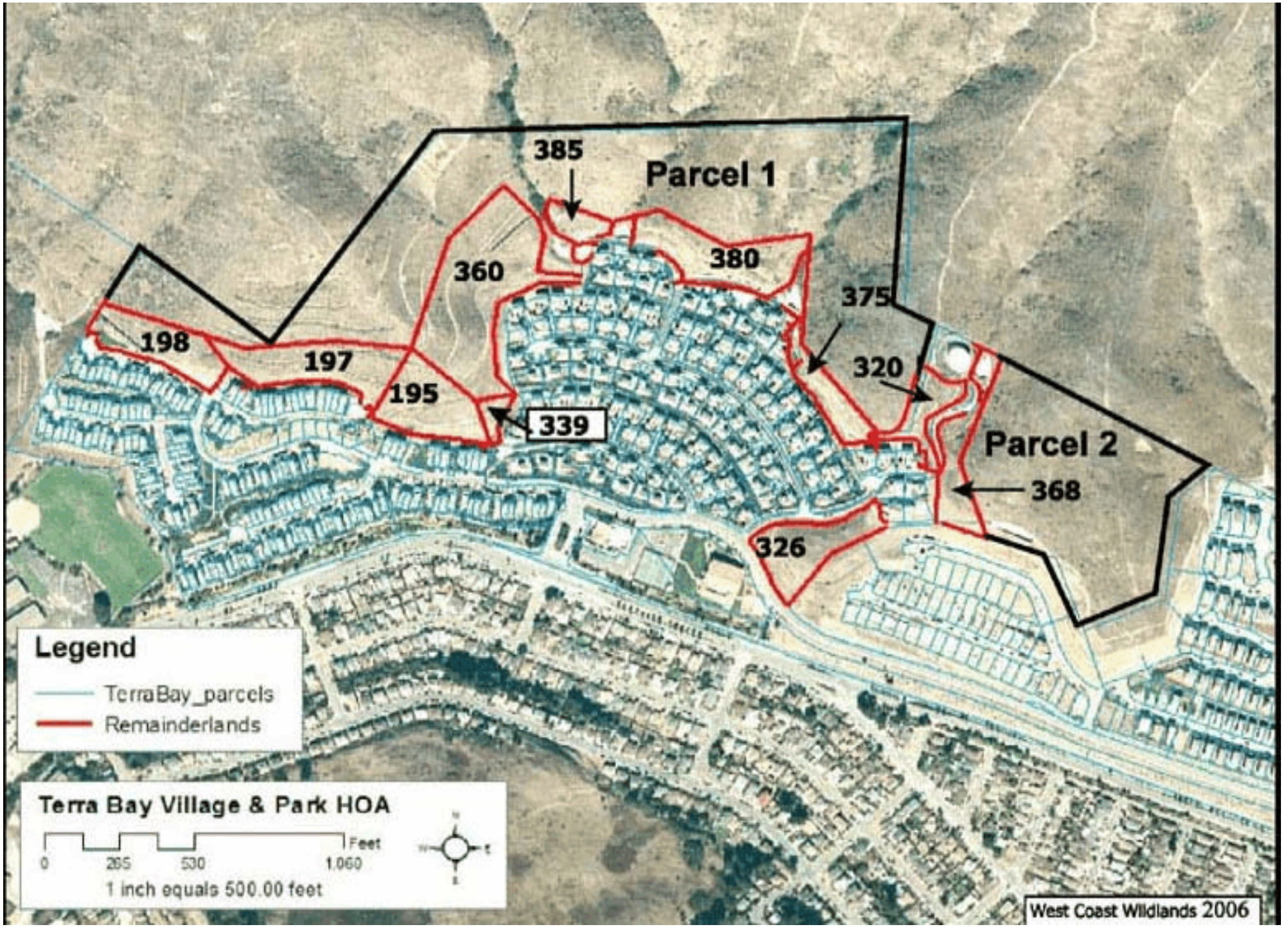


FIGURE 18: 2012 Weed Treatment Sites for Myers Peninsula Ventures, LLC

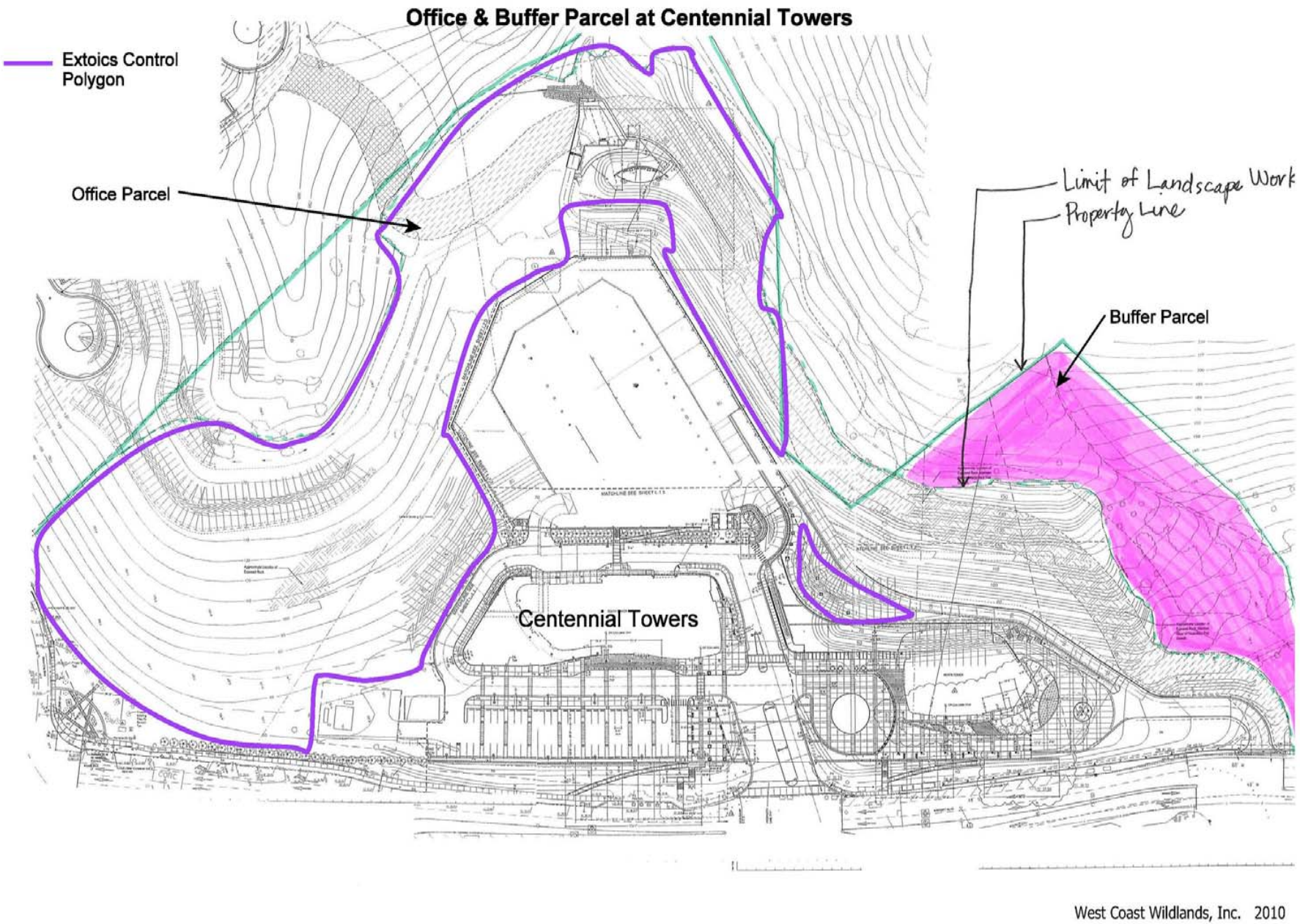


FIGURE 19: HTOL Management Units

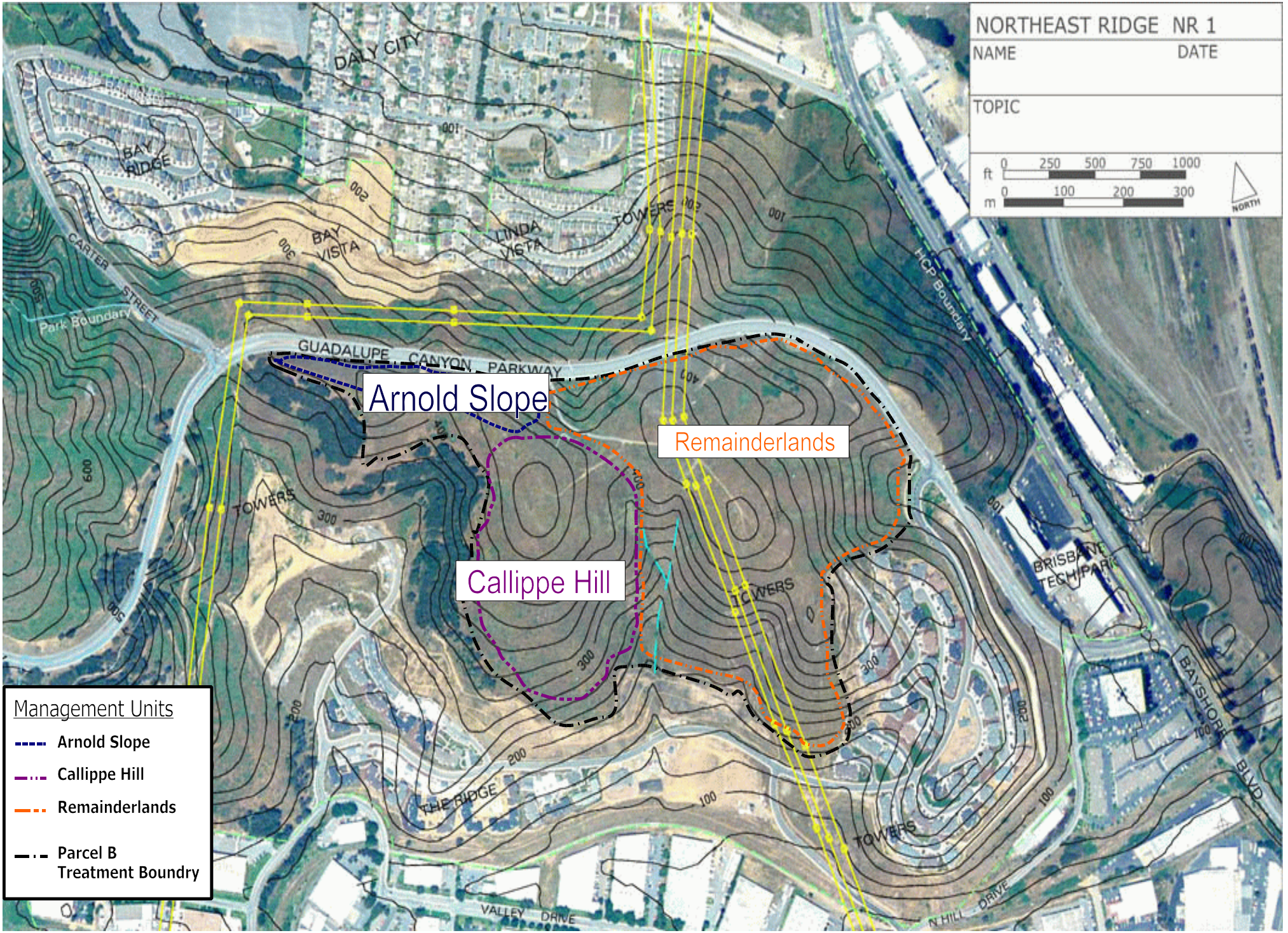


FIGURE 20: HTOL Weed Management Map

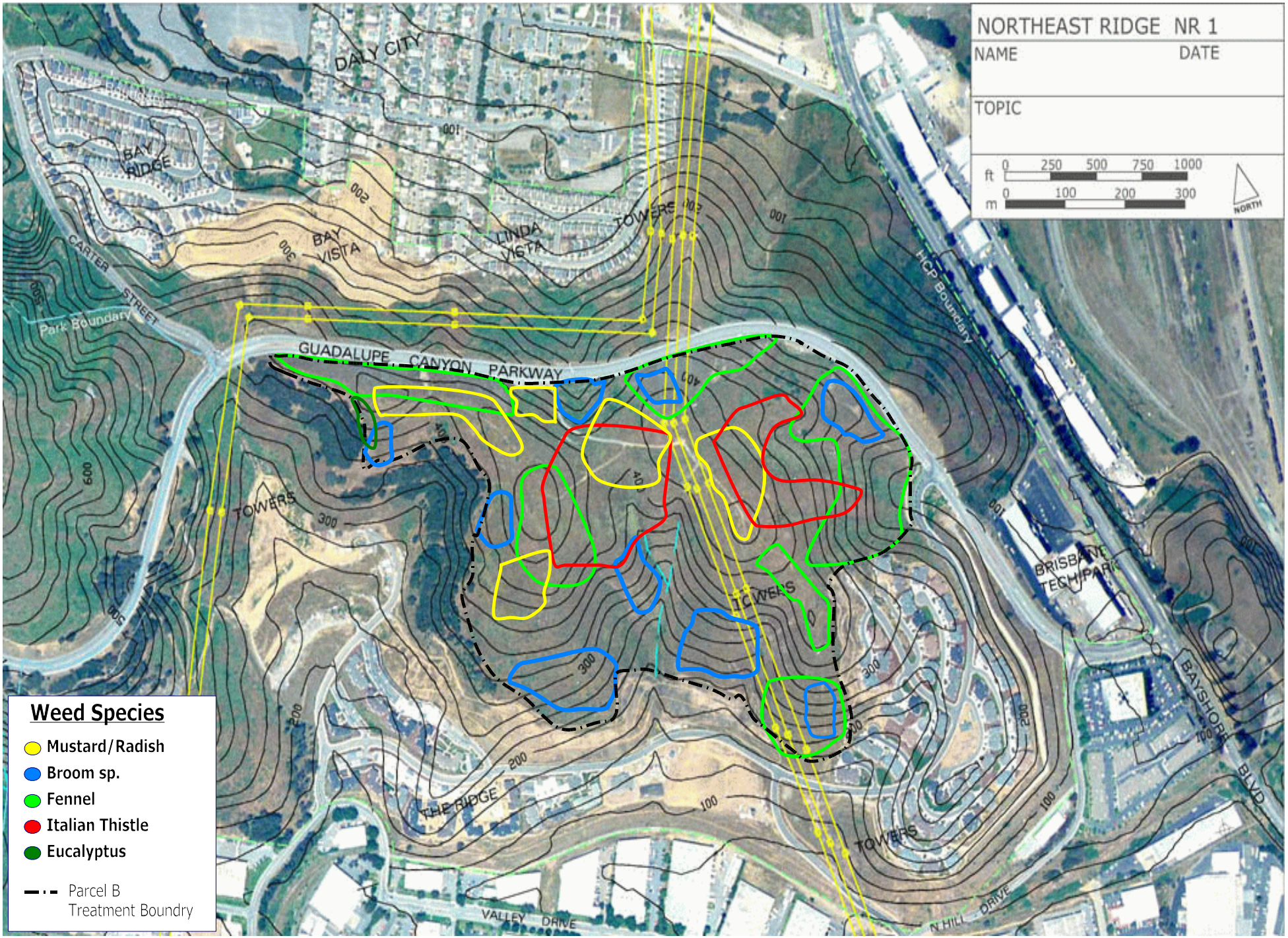
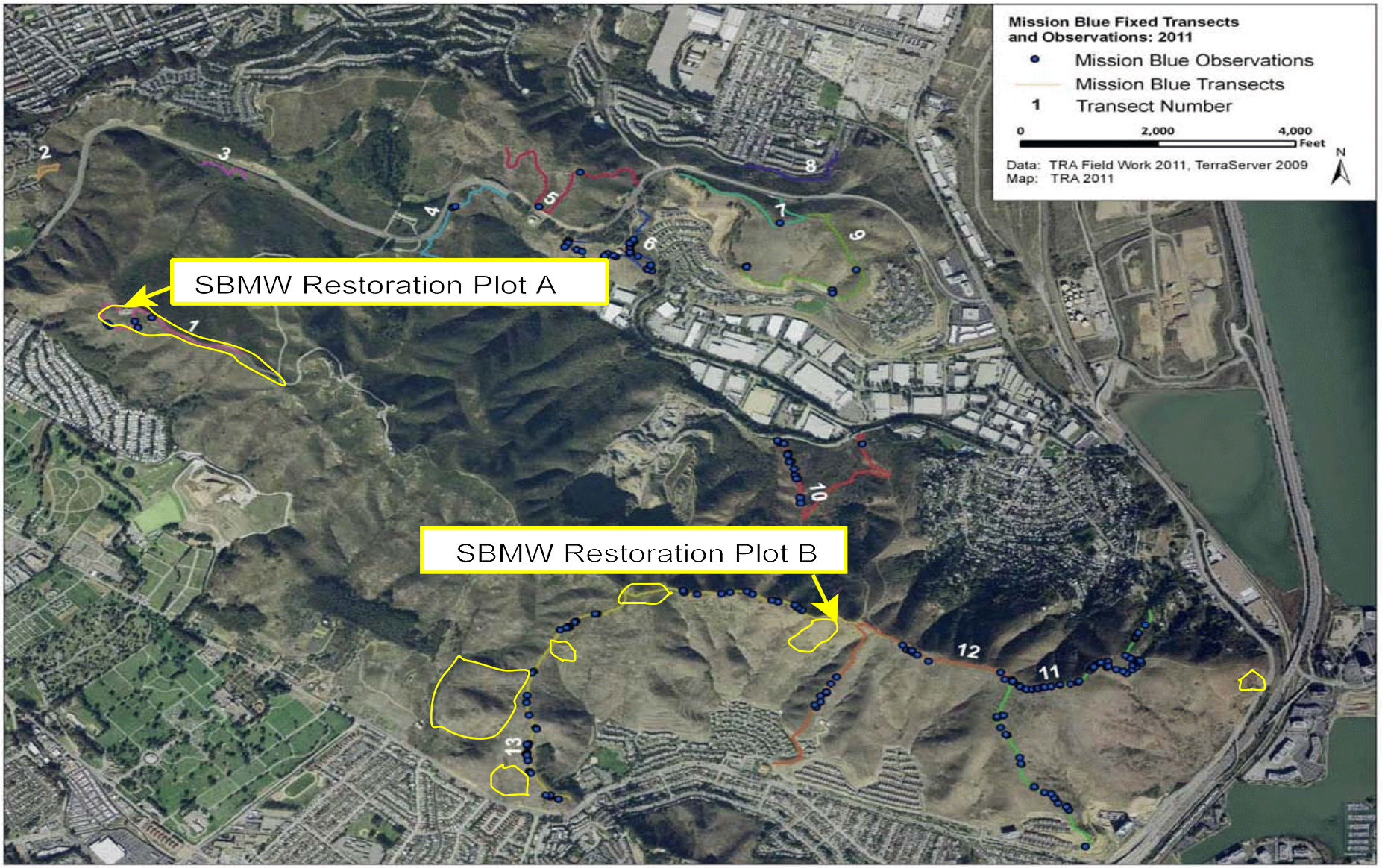


FIGURE 21: San Bruno Mountain Watch Oxalis Restoration Plots (Aerial Map of MB & CS transects provided by TRA)



Oxalis

Figure 2. 2011 Mission Blue Observations