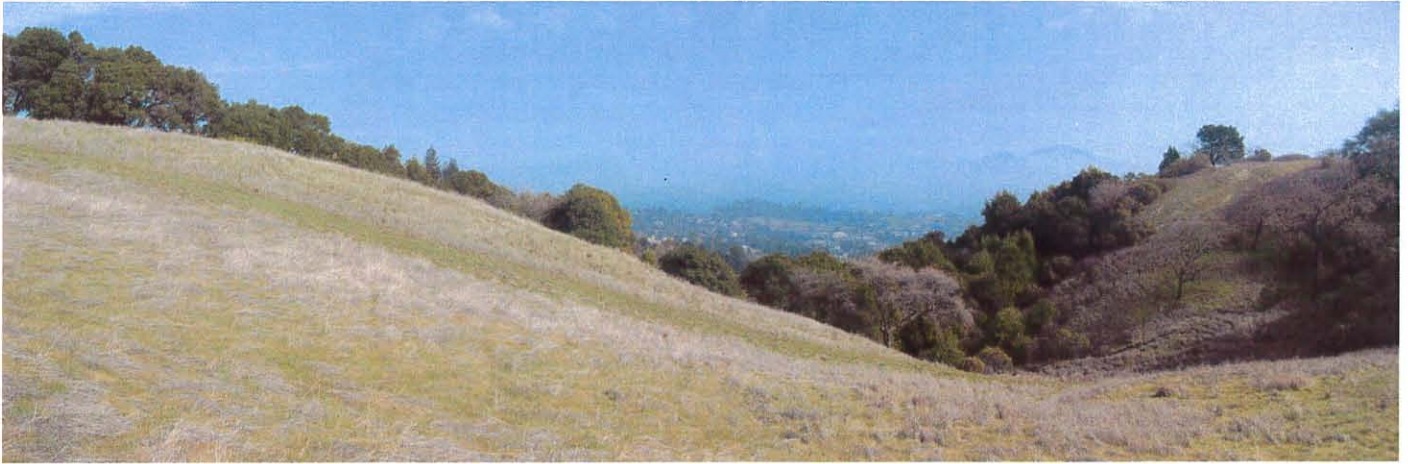


Vegetation Management Plan for Special-status Plant Species Diablo Helianthella (*Helianthella castanea*) and Robust Monardella (*Monardella villosa* ssp. *globosa*)

Soldier Field Partners Lafayette Subdivision Parcel
Lafayette, Contra Costa County, California



Prepared for:
Soldier Field Partners, LLC

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APPROVED
September 2008

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September 2008
As Approved by the City of Lafayette

**VEGETATION MANAGEMENT PLAN FOR
SPECIAL-STATUS PLANT SPECIES DIABLO
HELIANTHELLA (*HELIANTHELLA CASTANEA*)
AND ROBUST MONARDELLA (*MONARDELLA
VILLOSA* SSP. *GLOBOSA*) ON THE SOLDIER FIELD
PARTNERS LAFAYETTE SUBDIVISION PARCEL,
LAFAYETTE, CONTRA COSTA COUNTY,
CALIFORNIA**

The information provided in this document is intended solely for the use and benefit of Soldier Fields Partners, LLC.

No other person or entity shall be entitled to rely on the services, opinions, recommendations, plans or specifications provided herein, without the express written consent of EDAW Inc, 2099 Mt. Diablo Blvd Suite 204, Walnut Creek, CA 94596.

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SUMMARY

This Vegetation Management Plan for special-status plant species Diablo helianthella (*Helianthella castanea*) and robust monardella (*Monardella villosa* ssp. *globosa*) (hereafter Management Plan) has been developed for the 87-acre Lucas Ranch subdivision project located in Contra Costa County. The purpose of this Management Plan is to protect the special status plant resources on the project site, and to ensure that habitat for these plants remains on site. The Management Plan includes a description of Diablo helianthella and robust monardella, information about the natural history of the plants, the habitat in which they occur, and their location on the project site.

The special-status plant management area is located near the northern end of the Lucas Ranch property, along the eastern fence line. Eight residential lots are approved for the southern portion of the property, the nearest of which is greater than a quarter mile from the special-status plant management area. The special-status plant population will not be impacted by the development.

The goals and objectives of this Management Plan are to:

- Preserve the existing population of Diablo helianthella and robust monardella.
- Preserve suitable habitat for Diablo helianthella and robust monardella.
- Conduct monitoring of the special-status plant management area over a period of ten years. Monitoring will occur in years 1, 2, 4, 7, and 10.
- Consider the need for and, as appropriate, incorporate integrated pest management to control weeds within the management area, in the vicinity of the management area, and where feasible, on the entire property.
- Develop active management strategies to reduce the incursion of oak woodland and annual grassland into the habitat.
- Use adaptive management to meet the goals and objectives of this Management Plan.

1.0 INTRODUCTION

This Management Plan for special-status plant species Diablo helianthella (*Helianthella castanea*) and robust monardella (*Monardella villosa* ssp. *globosa*) (hereafter Management Plan) has been developed for the 87-acre Lucas Ranch subdivision project located in Contra Costa County. The purpose of this Management Plan is to protect the special status plant resources on the project site, and to ensure that habitat for these plants remains on site. The Management Plan includes a description of Diablo helianthella and robust monardella, information about the natural history of the plants, the habitat they occur in, and their location on the project site. Appropriate methods and management tools for maintaining the existing habitat for these species are discussed.

The study area is located southeast of the City of Lafayette in western Contra Costa County, approximately three miles south of Highway 24 and two miles east of Moraga Road (Figure 1). It is located between a residential development to the west and the Rossmoor planned community development to the east. Sparse, rural development and extensive open space extend to the north and south. The study area consists of rolling hills straddling a ridge between 610 and 790 feet in elevation. Vegetation communities on site include non-native annual grassland, coast live oak woodland, valley freshwater marsh and freshwater seeps, and coastal riparian scrub. The site had been grazed by eighteen head of cattle year-round for the last nine years, however, they were removed in 2006 (Greg Woerhle, personal communication 2007).

Diablo helianthella was identified on the project site during botanical surveys conducted by Sycamore Associates in 1999 and 2000 (Sycamore 2000), and by LSA Associates in 2005 (RBF Consulting 2005). Robust monardella was identified on the project site by LSA Associates in 2005 (RBF Consulting 2005). EDAW botanists Erin McDermott and Christopher Thayer conducted a reconnaissance site visit to the location of the special-status plants on January 26, 2007. Although winter is not the ideal time to conduct plant surveys, several individuals of Diablo helianthella were identifiable. No individuals of robust monardella were identified; however, it is known to grow in the same area as Diablo helianthella based on the report by LSA (RBF Consulting 2005). The location where the existing populations of Diablo helianthella and robust monardella occur and their associated habitat is referred to in this report as the special-status plant management area.

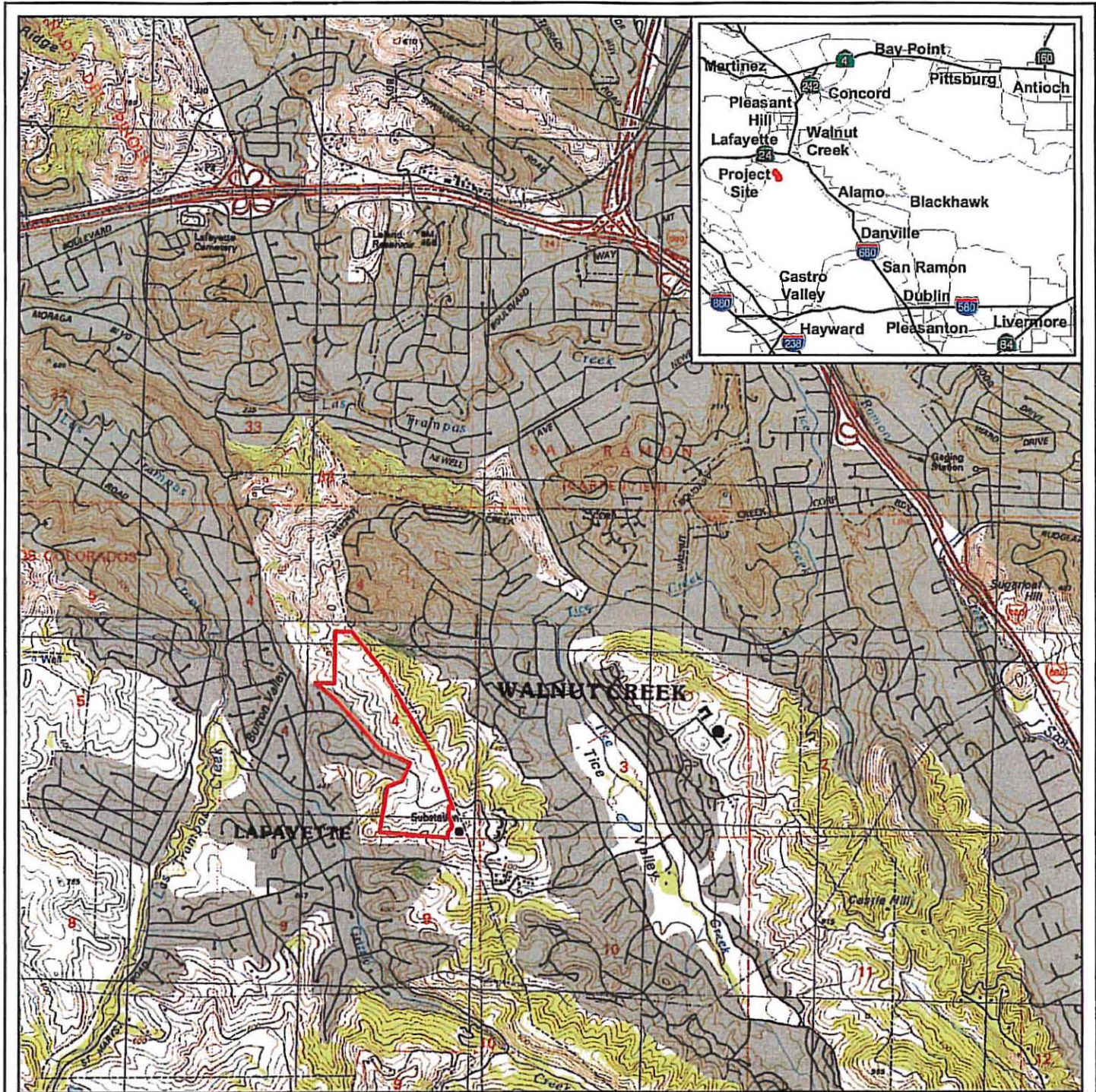
The population of Diablo helianthella is located near the northern end of the Lucas Ranch property, along the northeastern fence line (Figure 2 and 3, Photo 1 in Appendix A). The majority of the population is on a southeast-facing slope on an outcropping of Lafayette Tuff (Crane 1995a, 1995b). A few scattered individuals are located to the east about 75 feet away, on a northwest-facing slope (Figure 3, Photo 5 in Appendix A). The population is bordered to the east by coast live oak (*Quercus agrifolia*) woodland, to the north by shrubs typical of coast live oak understory and margin, and to the west by non-native annual grassland (Figure 3, Photo 1 in Appendix A). Details about the location of the special-status plant species and the habitat in which they were found is described in Section 2.0.

Eight residential lots are approved for the southern portion of the property, the nearest of which is greater than a quarter mile from the special-status plant management area (Figure

2). The special-status plant population will not be affected by the development. There is an existing dirt road that traverses the ridgeline, which is proposed for a public trail. The road passes within approximately 200 feet of the rare plant population.

The goals and objectives of this Management Plan are to:

- Preserve the existing population of Diablo helianthella and robust monardella.
- Preserve suitable habitat for Diablo helianthella and robust monardella.
- Conduct monitoring of the special-status plant management area and vicinity over a period of ten years. Monitoring will be conducted in years 1, 2, 4, 7, and 10.
- Consider the need for and incorporate integrated pest management to control weeds within the management area, in the vicinity of the management area, and where feasible, on the entire property.
- Reduce the incursion of oak woodland and annual grassland into the habitat.
- Use adaptive management to meet the goals and objectives of this Management Plan.




Legend

 Property Boundary

Figure 1
Location of the Project Site
Soldier Field LLC
 Lafayette, Contra Costa County, California

1:31,680 1/30/07
 1 inch equals 0.5 mile

0 0.5 1
 Mile



This document provided for the sole use of the Soldier Field LLC. Parcel boundary from Ward Young (2006). USGS quadrangle from the San Francisco Bay Area Regional Database. This document not intended for detail design work.

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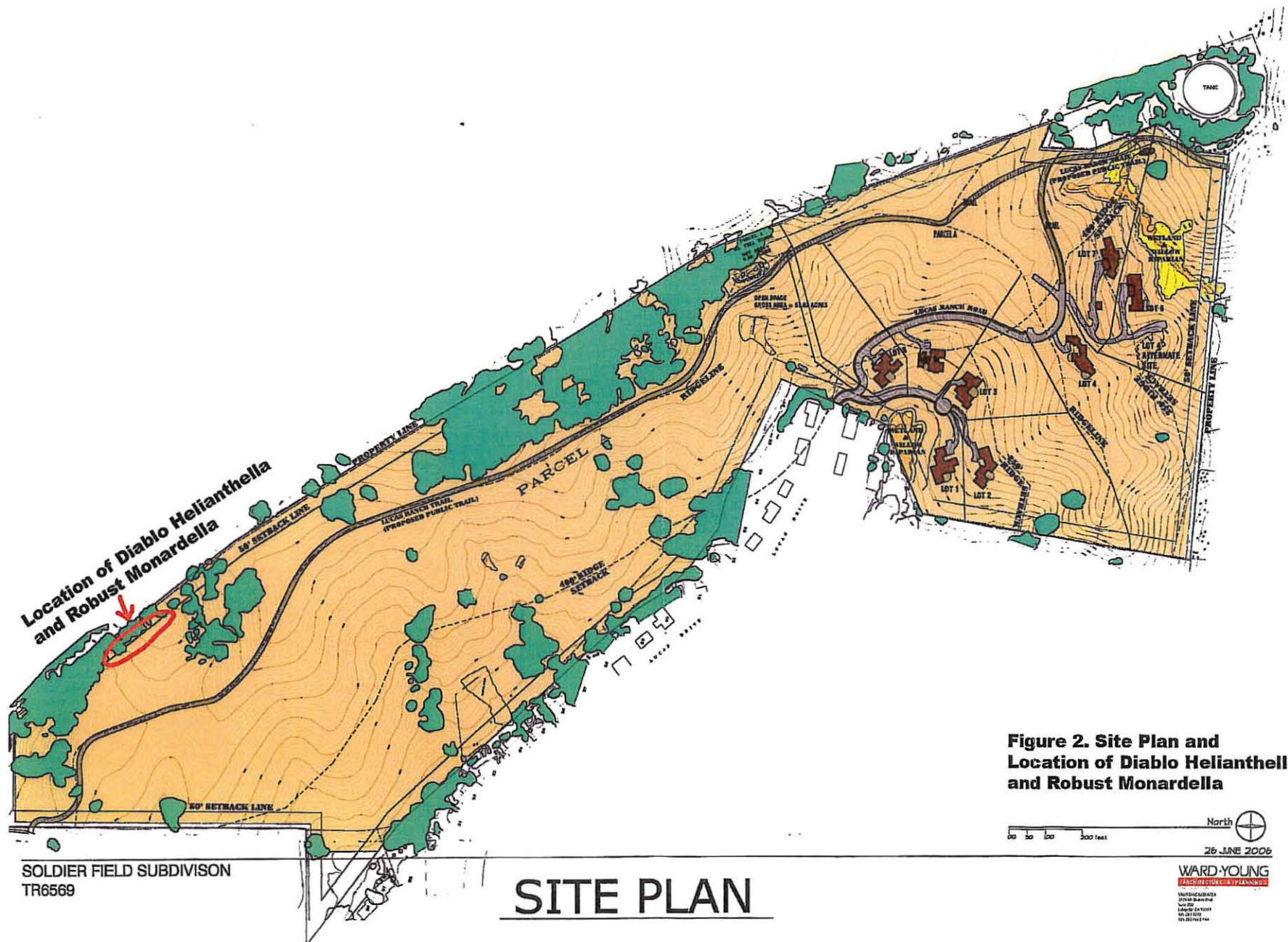
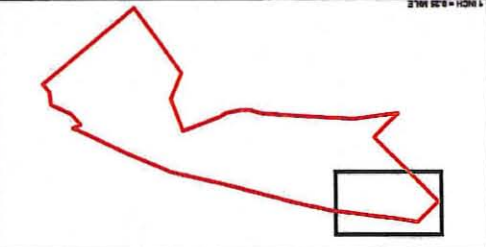
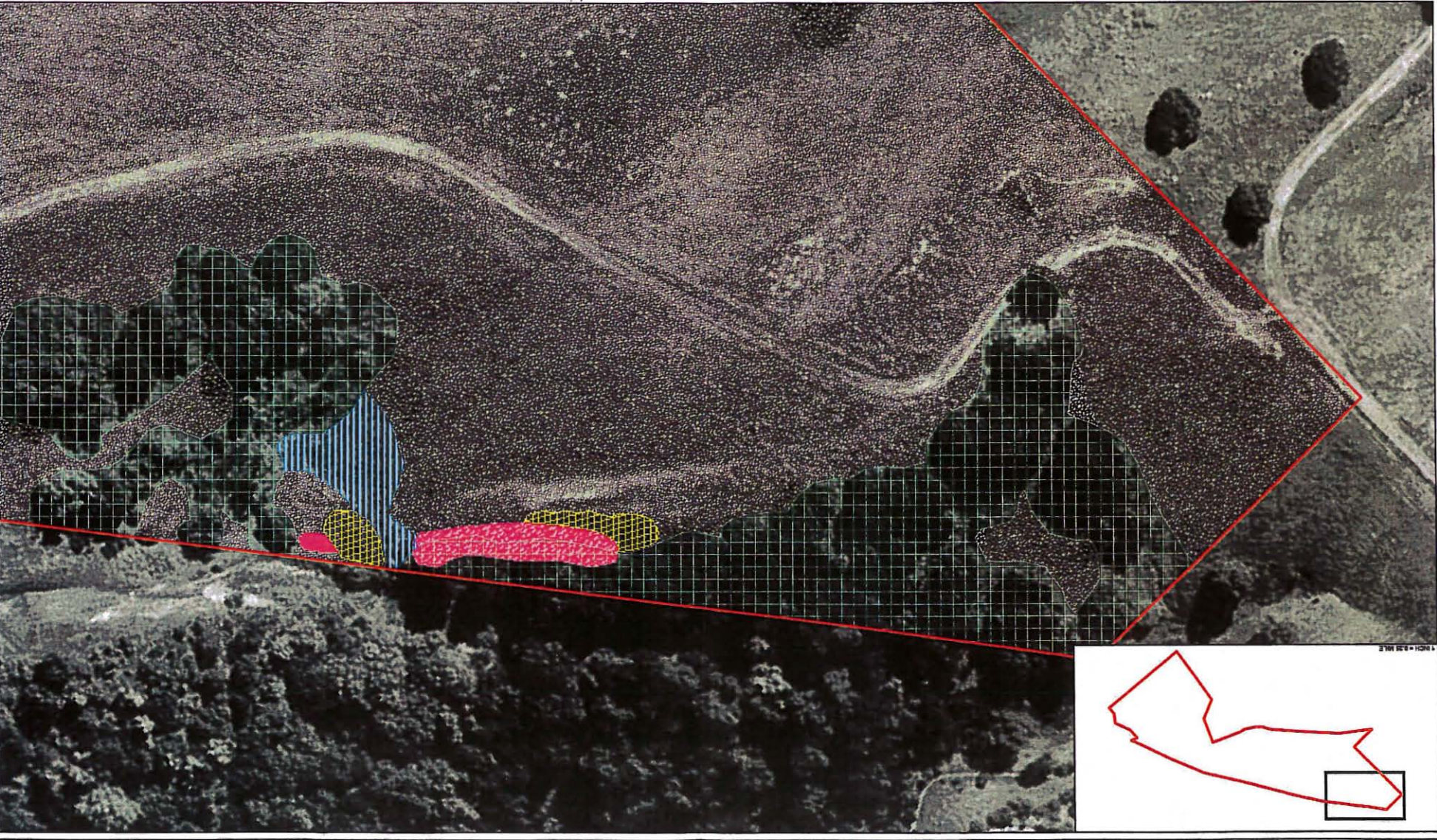


Figure 3
Location of Diablo Hellanthele
& Robust Monardella
Soldier Field LLC
 Lafayette, Contra Costa County, California
 Soldier Field, LLC 01307.mxd

Legend

- Oak Woodland Understory Shrubs
- Diablo Hellanthele
- Robust Monardella
- Coast Live Oak Woodland
- Wetland
- Grassland
- Property Boundary



0 75 150
 Feet 1 inch equals 75 feet
 1:900 2/2/07



This document provided for the site use of Soldier Field LLC. Existing conditions as noted during field reconnaissance January 2007. Study boundary information from Water Young (2006). Aerial photographs from HLM (2006). Accuracy as originally provided. This document not intended for detailed design work.

2.0 PLANT DESCRIPTION AND LOCATION ON SITE

2.1 Diablo Helianthella

Diablo helianthella (*Helianthella castanea*) is a stout perennial herb in the sunflower family (Asteraceae), growing from a much-branched caudex. Leaves are mostly basal and tufted, the blades oblong to oblanceolate, entire-margined, and ranging from three to eight inches long. Heads are solitary and borne on a long peduncle from between six and 20 inches tall, the involucre generally subtended by three or four foliaceous bracts. Heads are large, with 12 to 20 showy yellow ligules and a broad yellow disk. Fruits are eight to ten millimeters, obovate with a thick center and thin edge, and heart shaped (Hickman 1993). Flowers appear from April to June.

Diablo helianthella generally occurs in grasslands often on the margins of chaparral or scrubby oak woodland communities. Its distribution is restricted to Alameda, Contra Costa and San Mateo counties. It is believed to have been extirpated from Marin and San Francisco counties. Diablo helianthella is on the California Native Plant Society List 1B.2, indicating that it is rare, threatened, or endangered in California and is a California endemic (CNPS 2001, 2007).

The population of Diablo helianthella is located near the northern end of the Lucas Ranch property, along the eastern fence line (Figure 3, Photo 1 in Appendix A). The majority of the population is on a southeast-facing slope on an outcropping of Lafayette Tuff (Crane 1995a, 1995b). A few scattered individuals are located to the east about 75 feet away, on a northwest-facing slope (Figure 3, Photo 5 in Appendix A). Approximately 144 individuals were counted on site during focused surveys in 2000 by Sycamore (Sycamore 2000). The population is located along the edge of coast live oak woodland, adjacent to non-native annual grassland (Photo 1, Appendix A). The area where the Diablo helianthella occurs is visibly different from the adjacent coast live oak woodland, which is dominated by trees and shrubs, and the adjacent non-native grassland, which is dominated by tall, dense non-native grasses (Photo 2 and 3, Appendix A). The vegetation where the Diablo helianthella occurs is dominated by native herbs, and the vegetation is sparser and lower growing than the adjacent grassland.

Dense coast live oak trees and other woody vegetation form a boundary along the fenceline. Diablo helianthella is growing directly underneath or on the margin of an overstory canopy of several large coast live oaks. In one location, Diablo helianthella grows near the base of a valley oak (*Quercus lobata*) tree (Photos 3 and 4, Appendix A). The area is surrounded to the northwest by woody shrubs, including coffeeberry (*Rhamnus californica*), coyote brush (*Baccharis pilularis*), skunkbush (*Rhus trilobata*), poison oak (*Toxicodendron diversiloba*) and California Bay (*Umbellularia californica*), all common oak woodland associate species (Photo 6, Appendix A). Oak seedlings and other woody vegetation are sprouting throughout the area (Photo 4, Appendix A).

At the time of the present reconnaissance survey, the area did not appear to be heavily influenced by cattle grazing. The slopes appear to be too steep for cattle to lay in the shade

of the oak trees and there was no evidence of heavy cattle use such as bare earth, trampling, or browsing damage.

Native plant species found growing with Diablo helianthella on site include Great Valley grindelia (*Grindelia camporum* var. *camporum*), wavy-leaf soap plant (*Chlorogalum pomeridianum* var. *pomeridianum*), yarrow (*Achillea millefolium*), Hartweg's tauschia (*Tauschia hartwegii*), California sagebrush (*Artemisia californica*), climbing bedstraw (*Galium porrigens* var. *porrigens*), naked-stemmed buckwheat (*Eriogonum nudum* var. *auriculatum*), rigid hedge nettle (*Stachys ajugoides* var. *rigida*), Indian paint brush (*Castilleja affinis*), and death camas (*Zigadenus fremontii*), among others. Non-native plants found growing with Diablo helianthella include hoary mustard (*Hirschfeldia incana*), cranesbill (*Geranium dissectum*), wild lettuce (*Lactuca virosa*), and hedgehog dogtail (*Cynosorus echinatus*), among others.

The soil type in the area occupied by Diablo helianthella is mapped as Lodo clay loam 50 to 75 percent slopes (USDA 1977). Lodo series soils are somewhat excessively drained soils underlain by soft sandstone and shale. Runoff is rapid and the hazard of erosion is high where the soil is bare.

2.2 Robust Monardella

Robust monardella (*Monardella villosa* ssp. *globosa*) is an erect perennial herb in the mint family (Lamiaceae) that grows from a rhizome. Leaf blades are ovate, entire to serrate, with a tapered to obtuse base, ranging from 22 to 50 millimeters in length. Foliage is strongly scented. Heads are 20 to 40 millimeters wide. Bracts are 20 to 30 millimeters and reflexed. The corolla is purple (Hickman 1993). Flowers appear from June to July.

Robust monardella generally occurs in oak woodlands, coastal scrub, and openings in chaparral. It is found in Alameda, Contra Costa, Humboldt, Lake, Mendocino, Napa, Santa Clara, Santa Cruz, San Mateo, and Sonoma counties. Robust monardella is on the California Native Plant Society List 1B.2, indicating that it is rare, threatened, or endangered in California (CNPS 2001, 2007). Robust monardella is endemic to California.

No individuals of robust monardella were identified during the reconnaissance site visit conducted in January 2007 by EDAW botanists, however, it is known to grow in the same area as Diablo helianthella based on the reports by LSA (RBF Consulting 2005).

3.0 PRESERVATION

The existing population of Diablo helianthella and robust monardella on site will be preserved in the special-status plant management area. The special-status plant management plan area is located in the north of the property, greater than a quarter mile away from the development area in the southern portion of the property (Figure 2). There is an existing dirt road that traverses the ridgeline and is proposed for a public trail. The road passes within approximately 200 feet of the special-status plant population, which is far enough away that

trail-associated disturbance of the management area is not expected. The special-status plant management plan area is visible from the dirt road but is on a slope that faces away from the road (Photo 9, Appendix A).

4.0 MONITORING

4.1 Baseline Conditions

Although the presence and location of Diablo helianthella and robust monardella has been documented, more detailed data on the number of individuals, and composition of associated plant habitat is needed to establish baseline conditions.

Baseline data will be collected using the relevé method. The relevé method will use a predefined plot, which will be permanently marked on site using rebar stakes for relocation in following years. The relevé plot will be located to capture the entire special-status plant management area and demarcate the boundaries between the special-status plant habitat and the adjacent grassland and woodland. Absolute cover of all species in the relevé plot will be collected to determine the baseline cover of Diablo helianthella and robust monardella, associated plant species, and oak and other woody shrub seedlings. Data collected in following years will be compared to the baseline data to determine if habitat for Diablo helianthella and robust monardella is being maintained, and/or if the area is becoming dominated by weeds or woodland vegetation. The relevé plot markers will also be used to determine if the boundaries of the adjacent woodland and grassland are encroaching on the area.

4.2 Monitoring Schedule

A monitoring program shall be conducted over a period of ten years. Monitoring will be conducted in years 1, 2, 4, 7, and 10 following the acceptance of the Management Plan. The monitoring program will include: 1) special-status plant habitat monitoring (measurement of cover using the relevé method); 2) notation of invasive species within the management area and in the vicinity, and the need for control; 3) observation of existing and incipient problems and recommendations for remedial actions; and 4) photo documentation. Monitoring will determine management needs using adaptive management.

Table 1. Vegetation Monitoring and Reporting Schedule

Monitoring Type	Monitoring Frequency
Special-Status Plant Habitat Monitoring Years 1, 2, 4, 7 and 10	June
Monitoring Reports	Prior to December 31

Special-status plant habitat monitoring will be performed in June, over a period of ten years. Monitoring will be conducted in years 1, 2, 4, 7, and 10. During monitoring, a botanist will collect vegetation data in the predefined plot using the relevé method as described in detail above. The botanist will walk the management area and the vicinity and document any problems requiring corrective action. The botanist will make notations and observations about the presence of invasive plant species, evidence of woodland or grassland encroachment, the presence of debris or evidence of disturbance, and evidence of animal browsing. The botanist will provide specific recommendations regarding invasive plant control, woodland or grassland species control, debris removal, or other corrective actions. In addition, the botanist will view the project site from the road to determine if other weeds on site are becoming established.

Photographs showing a view of the management area will be taken during each visit at permanently established photo points. The photographs and field notes will clearly depict if the area is maintaining suitable habitat for Diablo helianthella and robust monardella.

4.3 Monitoring Reports

Monitoring reports shall be submitted to the City of Lafayette Planning Division and Soldier Field, LLC in years where monitoring is being conducted throughout the ten-year monitoring period. Monitoring reports shall describe monitoring methods and summarize data. They will also supply documentary photographs and provide a discussion of general observations, conclusions, and recommendations for remedial actions, if needed. Results shall be compared with performance standards for the project. The reports shall include a list of persons that monitored the site and prepared reports. Monitoring reports will be submitted by December 31 of each year to the City of Lafayette and Soldier Field, LLC. Soldier Field, LLC will be responsible for implementing all recommended remedial actions detailed in the monitoring report during the ten-year monitoring period. After that time the Homeowners Association is responsible for all management actions within the open space parcel.

5.0 PERFORMANCE STANDARDS

Monitoring results shall be compared to relevant performance standards in order to judge success of the management area. If performance standards have not been achieved at the end of the ten year monitoring period, the maintenance and monitoring period could be extended or additional actions could be required based on consultation with the City of Lafayette.

Performance standards are based on mitigation goals and known constraints of the site. The mitigation effort shall be considered successful when the performance standards are met.

Table 2. Performance Standards for Diablo Helianthella and Robust Monardella Management Area

Performance Standard	How Performance Standard Will Be Measured	Contingency Measures
<p>Maintain and preserve habitat for Diablo helianthella and robust monardella within the management area.</p>	<p>Habitat monitoring will occur over ten years in years 1, 2, 4, 7, and 10 and will include collection of vegetation data in the management area to determine if habitat for Diablo helianthella and robust monardella is being maintained, and/or if the area is becoming dominated by weeds or woodland or grassland vegetation.</p> <p>The botanist will provide specific recommendations regarding mowing, invasive plant control, pest control, debris removal, or fencing.</p>	<p>Soldier Fields LLC will implement recommendations. Soldier Fields LLC will take all additional steps necessary to achieve the standard, and shall extend the monitoring period until the standard is achieved.</p>
<p>Invasive plant species should be controlled within the special-status plant management area, within the vicinity of the management area, and where feasible, within the entire project site. Invasive plant species that shall be controlled to the greatest extent possible include: artichoke thistle, milk thistle, Italian thistle, and other species, as determined by the project's botanist. Non-native annual grasses species currently found on site shall be tolerated.</p>	<p>Site surveys will determine if these or other invasive exotic weed species are present in the management area or project site and threaten habitat viability.</p>	<p>Control measures will be implemented if these species threaten to become established.</p>
<p>Implement recommendations made in monitoring report and carry out adaptive management.</p>	<p>Monitoring will be used to determine if recommendations made in the monitoring report are being implemented.</p>	<p>Soldier Fields LLC will implement recommendations. Soldier Fields LLC will take all additional steps necessary to achieve the standard and shall extend the monitoring period until the standard is achieved.</p>

6.0 ADAPTIVE MANAGEMENT

Adaptive management techniques will be used to ensure the long-term survival of the existing Diablo helianthella and robust monardella populations on site. When attempting to assure long-term survival of any species through management actions it is possible that some decisions intended with positive results may in fact endanger the survival of the target species. Through monitoring and adaptive management, different strategies can be developed and applied during the monitoring period, with the objective of the survival of the Diablo helianthella and robust monardella, in order to meet the performance standards.

6.1 Fencing and Signage

Fences or signs are not currently proposed as part of this plan, but may be recommended for installation during the monitoring period to protect the populations from unauthorized access should problems develop. In the event that fencing is necessary, it would only be located where a problem area has been identified, such as soil compaction or plant damage due to human traffic, or herbivory. The fencing would enclose the entire existing population of Diablo helianthella and robust monardella and their associated suitable habitat that has been previously identified. Where less intrusive unauthorized access is occurring it is possible that signage indicating the presence of an environmentally sensitive area nearby may suffice.

6.2 Invasive Species Control

Invasive plant species control in the project site will follow an Integrated Pest Management Approach. Integrated Pest Management is a decision-making and management process that uses knowledge from a broad base of expertise, a combination of treatment methods, and a monitoring and evaluation system to solve pest problems in an environmentally sound and cost-effective manner. Integrated Pest Management programs emphasize pest prevention by using knowledge about the biology and behavior of pest species to identify and remove the habitat and other conditions that support pests.

Invasive weed species should be controlled within the special-status plant management area. Weed seedlings in the management area should be hand pulled to avoid damage to Diablo helianthella, robust monardella, and the associated native vegetation. At the time of the reconnaissance site visit, the management area was mostly free of invasive weeds. One sprout of common firethorn (*Pyracantha angustifolia*) was identified in the middle of the management area. In the management area, early detection of weeds and hand removal will likely be successful.

Invasive weeds should also be controlled on the entire project site. Innocuous, naturalized weeds that do not threaten native species, or would be impossible to control, should be ignored. An example is the non-native annual grasses that are pervasive throughout the grasslands on site. Invasive species noted on the project site that should be controlled to the greatest extent possible include artichoke thistle (*Cynara cardunculus*), common firethorn, periwinkle (*Vinca major*), yellow star thistle (*Centaurea solstitialis*), Italian thistle (*Carduus pycnocephalus*) and milk thistle (*Silybum marianum*) (Photo 8, Appendix A).

In some cases, hand pulling of many weed species is ineffective, due to their ability to regenerate from root fragments. Invasive exotics that become well-established frequently require repeated control efforts. Control efforts should always be undertaken before the weeds can bloom and set seed, but if they have begun blooming, flowers and/or seeds should be carefully bagged and properly disposed to prevent the weeds from spreading.

A wide array of treatments is available to control weeds, including manual methods, mechanical methods, the application of organic hot foam, or the use of a flaming device and in some cases localized conservative application of herbicides. The use of grazing, mowing, and fire for control of invasive plant species is discussed in detail below. Mechanical, manual, and alternative methods of eradication of exotic species should take precedence over chemical eradication.

When needed, herbicides should be used in conjunction with physical, mechanical, or other non-chemical methods rather than used as the sole management tool. This integrated approach helps minimize use of herbicides in the long-term, and enhances the efficacy of the lowest-risk chemical products and formulations because they are augmented with other methods. Spot-treatments rather than broadcast sprays are preferred in order to limit or avoid impacts on non-target organisms. If chemical weed controls are employed, all applicable laws, regulations, safety precautions, and label directions must be followed. Application of any herbicide or chemical control should be conducted by a licensed pesticide applicator.

6.3 Woodland Vegetation Management

The area where the Diablo helianthella is present is dominated by native herbs, and the vegetation is sparse and low growing compared to the adjacent grassland. The area is immediately adjacent to dense coast live oak woodland, as described in Section 2.0. Several large coast live oaks formed an overstory canopy in which Diablo helianthella is growing directly underneath. The area is surrounded to the northwest by woody shrubs. Oak seedlings and other woody vegetation are sprouting throughout the area.

Management of the woodland vegetation will be necessary to prevent it from encroaching and overcoming the Diablo helianthella and robust monardella habitat. Overgrowth of the woody vegetation would likely shade out the existing special-status plants. Manual removal of oak and other woody vegetation seedlings from within the management area should be performed yearly. Handpulling is recommended to avoid damage to adjacent vegetation. Manual pruning of the adjacent shrubs to keep them from growing into the area may also be deemed necessary. Recommendations for further wood vegetation management and control will be made based on the results of monitoring site visits. Grazing, mowing, and fire are also useful methods for woody vegetation control and are discussed below.

6.4 Grassland Vegetation Management

The special-status plant management area is bordered to the west by grassland. The grassland is dominated by non-native annual grasses, and is much taller and more densely vegetated than the management area. Management of the grassland vegetation may be necessary to prevent it from encroaching into the Diablo helianthella area. It appears that

there is a natural vegetation break between the grassland and the management area likely due to a change in soils and aspect.

Non-native grasses and forbs have the ability to outcompete native species for water and nutrients, which may lead to native plant mortality and negatively impact Diablo helianthella and robust monardella plants. Non-native grasses may also produce thatch, which may negatively impact the special-status plant population. Grassland management will be accomplished by the use of mowing in the area adjacent to the special-status plant management area. This is further described in Section 6.5.2 below.

6.5 Vegetation Management Tools

It is expected that the best approach to managing vegetation for the special-status plant species, Diablo helianthella and robust monardella, will be through the use of mowing adjacent to the management area. Section 6.5.1 describes the specific recommendations for this management regime. In addition, within the larger open space parcel, it is recommended that disking occur in accordance with Contra Costa County Fire Protection District standards. This is further described in Section 6.5.2 below. Section 6.5.3 provides a third option, intermittent grazing, for vegetation management on the property if during the monitoring period the mowing and disking are found to be inadequate in achieving the overall goals of this Management Plan.

6.5.1 Mowing

Mowing can be an effective tool for the reduction of grassland biomass and for weed control. As with all vegetation management techniques, timing of mowing is critical. Mowing before the weed seed matures can help to eliminate the year's crop of weed seed. However, mowing too early in the season can result in some weed species re-growth and can stimulate production of another weed seed crop. Two mowing passes can be used in very thick stands of weeds. Generally, mowing reduces competition for native seedlings, allowing light and resources to reach the young natives. Mowing heights should allow at least four inches of growth to remain to avoid injuring existing native grasses.

In order to deter encroachment of non-native annual grassland into the special-status plant management area, mowing adjacent to the area should be conducted on an annual basis. Mowing should be conducted in mid to late March to avoid potential impacts to the special-status plants during flowering and fruiting. The mowing swath is shown in Figure 4. Mowing should be conducted in the non-native annual grassland in a swath approximately 100 feet in width. Mowing should avoid the special-status plant populations. Mowing should also avoid the wetland area adjacent to the special-status plant locations. Prior to mowing, a qualified botanist should flag the sensitive areas to be avoided. All thatch produced during mowing should be removed from the project site and disposed of properly.

6.5.2 Disking for Fire Management

To address Contra Costa County Fire Protection District standards for weed abatement, firebreaks shall be disked within the open space parcel. A firebreak shall be disked on either side of the Lucas Ranch trail. Additionally, a firebreak shall be disked along the southern

edge of the open space parcel, and the western and northwestern property boundaries. Disking shall be conducted in accordance with the Minimum Weed Abatement Standards of the Contra Costa County Fire Protection District that are provided in Appendix B.

Disking SHALL NOT be conducted within or adjacent to the special-status plant species populations. Disking SHALL NOT encroach within the 100-foot mowing swath for the special-status plant species shown in Figure 4. Finally, disking SHALL NOT be conducted through any wetlands or drainages within the open space area.

Because the optimum time for fuel reduction (generally in the spring) occurs during nesting season for most avian species (between February 1 and August 31 for passerines and non-passerine land birds) it is recommended that 15 days prior to disking, a survey for ground nesting birds be conducted by a qualified ornithologist in the areas that will be disked including a 90-foot-buffer. Active bird nests of all species except starlings, English house sparrows, and rock doves (pigeons), are protected under the federal Migratory Bird Treaty Act of 1918 and the California Department of Fish and Game Code §§ 3503 and 3503.5, which prohibit the destruction or disturbance of active nests.

If nesting birds are found within the disturbance area or in shrubs or trees adjacent to the site, a buffer should be established around the nest in coordination with the California Department of Fish and Game. Buffer zones typically range between 50 feet to 90 feet for passerines and nonpasserine land birds, depending on the sensitivity of the species to human disturbance and site conditions. Active nests should be monitored to determine when the young have fledged and are safely feeding on their own.

6.5.3 Grazing

Grazing with livestock is a powerful vegetation management tool that can be used to manage ecosystem health. Grazing livestock can convert continuous cover of grasses and other vegetation to patchy vegetation, thereby creating intermediate disturbance regimes and promoting favorable conditions for native plants. However, if used improperly, grazing can result in detrimental effects. Grazing livestock can trample plants and animals, compact and disturb soil (particularly around ponds and other aquatic sites), and add or concentrate nutrients to the site in the form of manure. Overgrazing of livestock can denude the landscape, reducing forage and cover for wildlife species.

The project site had been grazed by eighteen head of cattle year-round for the last nine years, however, they were removed in 2006 (Greg Woerhle, personal communication 2007). At the time of the present reconnaissance survey, the special-status plant management area did not appear to be heavily influenced by cattle grazing. The slopes appear to be too steep for cattle to lay in the shade of the oak trees and there was no evidence of heavy cattle use such as bare earth, trampling, or browsing damage. However, intermittent grazing in the management area could provide benefits including removal of grassland vegetation, and grazing of encroaching woodland vegetation.

Figure 4
Location of Mowing Swath
 Soldier Field LLC
 Lafayette, Contra Costa County, California

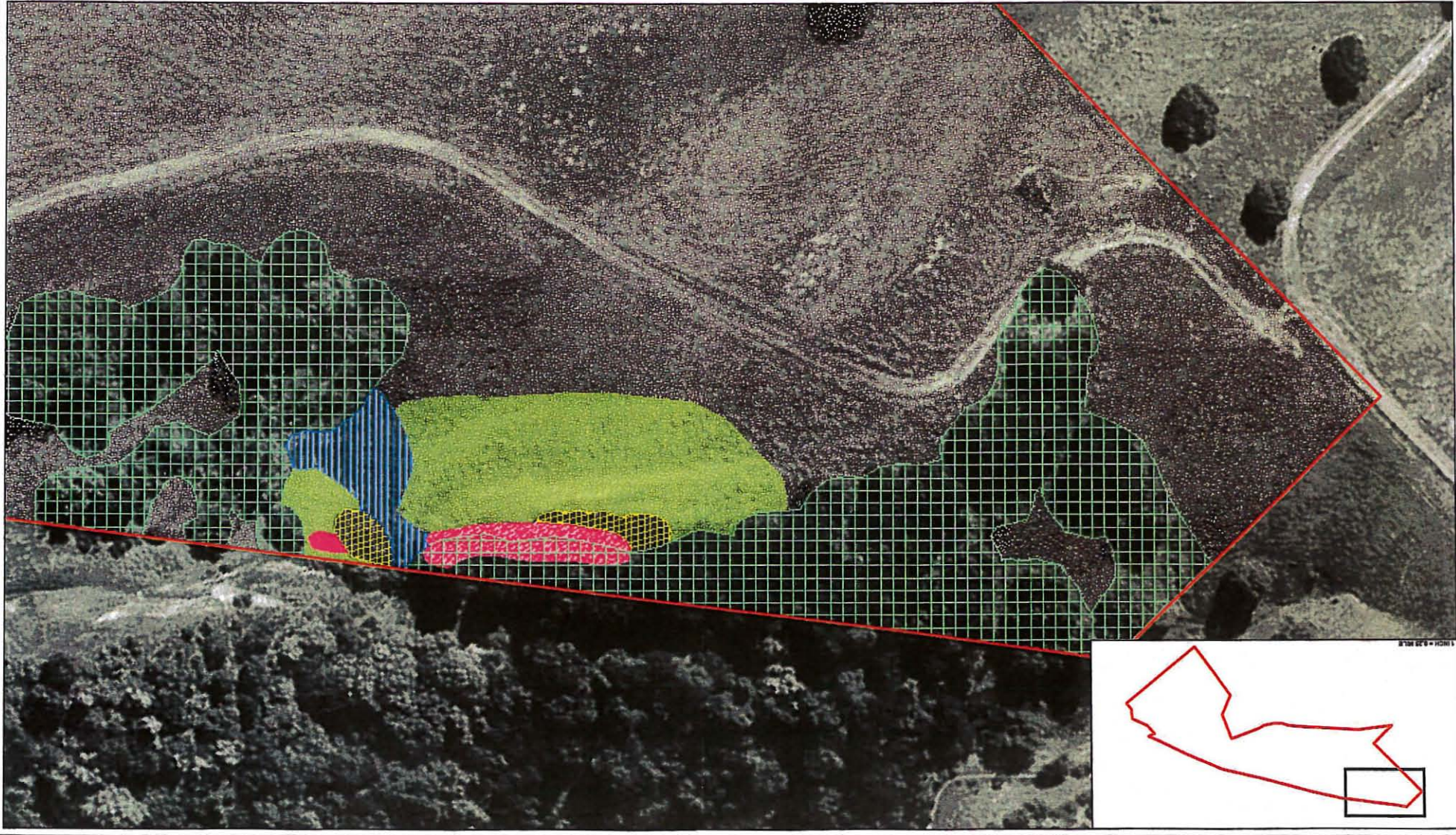
Project: Soldier Field LLC, 10000 Mowing Ave 082207.mxd * * *

- Legend**
- Mowing Swath
 - Oak Woodland Understory Shrubs
 - Diablo Helianthella
 - & Robert Monticola
 - Diablo Helianthella
 - Wetland
 - Coast Live Oak Woodland
 - Property Boundary
 - Grassland

0 75 150 Feet 1 inch equals 75 feet
 1:900 8/22/07

This document provided for the sole use of Soldier Field LLC. Existing conditions as noted during field reconnaissance January 2007. Study boundary information from Ward Young (2006). Aerial photographs from LHM (2007). Accuracy as originally provided. This document not intended for detailed design work.

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There are no current or future plans to graze cattle within the open space parcel. However, if habitat monitoring shows that exotic species, woodland, or grassland species are encroaching on the management area, intermittent grazing by other species could be considered as part of an adaptive management approach. Intermittent grazing by other species, such as goats or sheep, is an excellent option for fire management and to prevent the encroachment of woody vegetation into the Diablo helianthella and robust monardella habitat. Cattle primarily feed on grasses and mature cattle have difficulty in moving across steep, rocky terrain. In contrast, sheep and goats can use slopes up to 45 percent and will tend to feed primarily on broad-leaf forbs and woody vegetation respectively, and so would be ideal for this type of vegetation management.

Intermittent grazing by professional goat and sheep grazers will take several days to two weeks depending on the condition of the vegetation on site and requires only coordination with the professional grazers. They provide portable electric fencing, a 24-hour per day shepherd, and herding dogs to move the goats or sheep selectively through the site. If necessary, the sensitive plant species can be tarped or fenced to prevent damage from goats. The herd is present on the site only for a few days. One professional grazer that can provide this type of service is Goats-R-Us (510) 526-3337, <http://www.goatsrus.com/>.

6.6 Management and Maintenance Schedule

Table 3. Maintenance Schedule

Maintenance Action	Timing
Mow swath adjacent to special-status plant management area	Annually in mid-late March
Hand pull seedlings of woody vegetation	Annually in early spring
Pre-disking surveys for nesting birds	Annually 15 days prior to the start of diskling activities
Disking of firebreaks	Annually in spring
Invasive species management	Annually in accordance with recommendations made during the monitoring visits

7.0 FINANCIAL ASSURANCES AND RESPONSIBILITIES

Soldier Field, LLC shall be responsible for implementing the Management Plan including the ten-year monitoring and reporting period. They will be responsible for all required maintenance including mowing and removal of woody vegetation as well as implementing any recommendations made in the monitoring reports. After the ten-year monitoring period has been completed, management of the special-status plant management area will be a responsibility of the Homeowner's Association.

8.0 REFERENCES

- California Native Plant Society (CNPS). 2001. *Inventory of Rare and Endangered Plants of California (sixth edition)*. Rare Plant Scientific Advisory Committee, David P. Tibor, Convening Editor. Sacramento, California. 388 pp.
- California Native Plant Society (CNPS). 2007. *Inventory of Rare and Endangered Plants (online edition, v7-07a)*. California Native Plant Society. Sacramento, CA. Accessed on Friday, February 2, 2007 from <http://www.cnps.org/inventory>
- Contra Costa County Fire Protection District. 2007. Weed Abatement Standards [Online]. Thursday, December 27, 2007 <http://www.cccfpd.org/fpb/documents/Weedstds-04-07.pdf>
- Crane, Ron. 1995a. Geologic Map of the Las Trampas 7.5' Quadrangle. Unpublished.
- Crane, Ron. 1995b. Geologic Map of the Walnut Creek 7.5' Quadrangle. Unpublished.
- DiTomaso, Joseph. 2001. Yellow star-thistle information, [Online]. Davis, CA: University of California, Weed Research and Information Center (producer). Available: <http://wric.ucdavis.edu/yist> [2002, February 20].
- Hastings, M. S. and Joseph M. DiTomaso. 1996. Fire Controls Yellow Starthistle (*Centaurea solstitialis*) in California Grasslands. Symposium Proceedings. California Exotic Pest Plant Council. pp. 1-5.
- Hickman, J.C. 1993. *The Jepson Manual: Higher Plants of California*. University of California Press, Berkeley, California. 1400 pp.
- RBF Associates. 2005. *Soldier Field Subdivision Draft EIR, City of Lafayette*. October 2005.
- Sycamore Associates LLC. 2000. *Botanical Assessment of the Lucas Ranch Property, Lafayette, Contra Costa County, California*. November 29, 2000.
- United States Department of Agriculture (USDA). 1977. *Soil Survey of Contra Costa County, California*. Natural Resource Conservation Service. September.

Personal Communications

- Woehrle, Greg. 2007. Woehrle and Son Builders. Personal communication with Erin McDermott, EDAW, January 10, 2007.

APPENDIX A
Photographs of the Management Area



Photo 1. Overview of the Diablo helianthella and robust monardella management area looking northwest. To the right of the line is the low patchy native vegetation where Diablo helianthella was growing along the margin of dense coast live oak woodland. To the left of the line is dense non-native annual grassland. The swath to the left of the photo was tilled through non-native annual grassland. January 26, 2007.

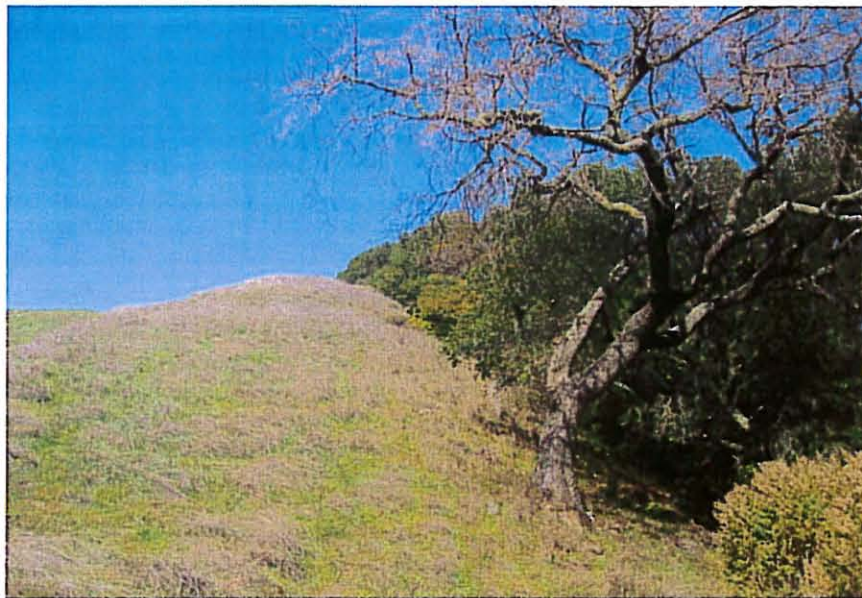


Photo 2. Closeup of the valley oak shown in Photo 1 above. Note sparse, native vegetation under the tree and dense non-native annual grassland to the left. January 26, 2007.



Photo 3. Diablo helianthella plant growing under the canopy of oak woodland. January 26, 2007.



Photo 4. Diablo helianthella individuals growing under the valley oak tree. Note the dense California bay in the background and bay seedlings sprouting near the Diablo helianthella. January 26, 2007.

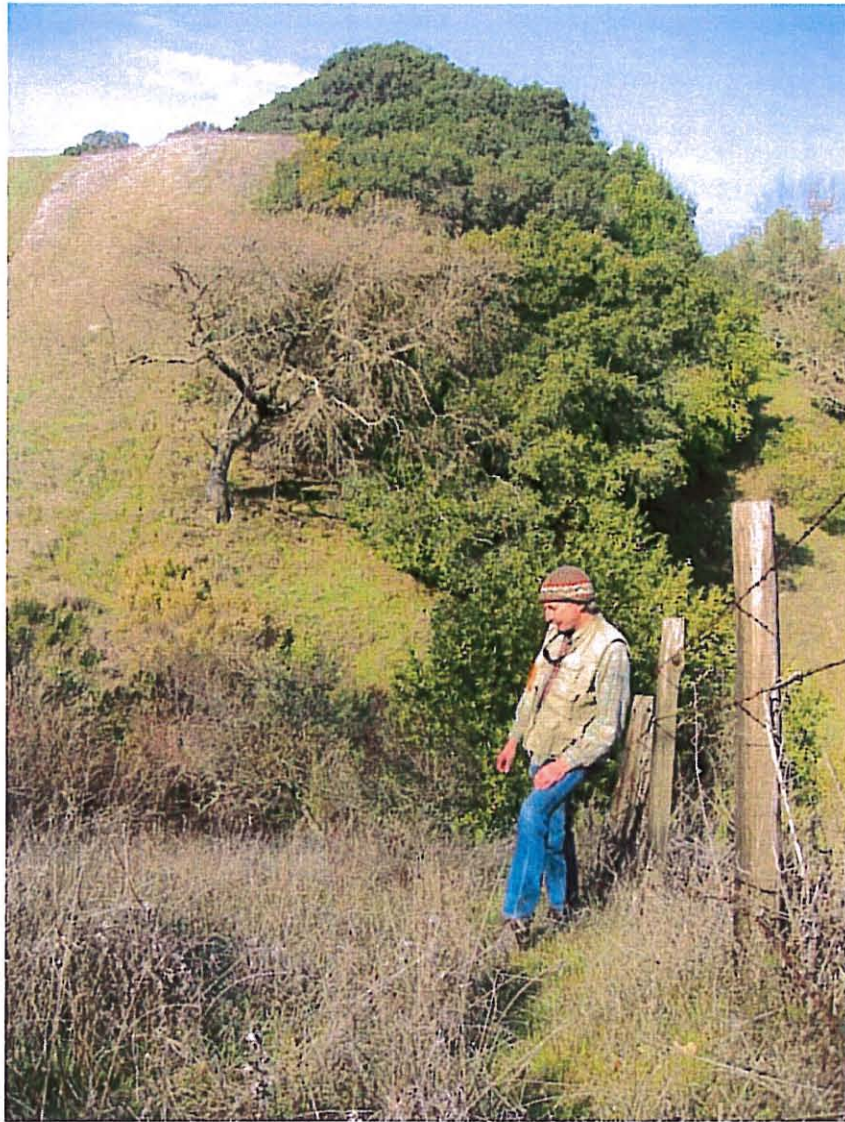


Photo 5. Location of outlying *Diablo helianthella* individuals (at feet of biologist) on a northwest facing slope. Main population is in the background on the distant slope. January 26, 2007.



Photo 6. Coyote brush and California sagebrush further upslope in the Diablo helianthella and robust monardella area. Note lower growing vegetation to the right and dense annual grassland to the left. Shrubs may need to be managed to maintain habitat for the special-status plants. Photo facing north. January 26, 2007.



Photo 7. Diablo helianthella in the understory of coast live oak and adjacent to California bay. Note thick non-native annual grassland to the left behind the biologist. Stones were visible on the soil surface in the area where native vegetation and Diablo helianthella were growing. January 26, 2007.



Photo 8. Artichoke thistle individual found near the special-status plant management area. Photo facing south. January 26, 2007.



Photo 9. View of landscape facing east from existing dirt road. Diablo helianthella and robust monardella location and habitat are underneath and to the left of the valley oak in the center of the photo. Dense non-native annual grassland is in the foreground. Dense coast live oak woodland borders the property fenceline. January 26, 2007.

APPENDIX B

Contra Costa County Fire Protection District Weed Abatement Standards

Minimum Weed Abatement Standards:

a) **Parcels five acres or less in size:**

Maintain all weeds at a height of **no more than 3 inches**. Weeds and grasses must be disced, (see "Discing Quality" below), mowed, with material mulched, or raked and bagged, and removed from the property. Parcels may require additional abatement during the season due to the regrowth of weeds and other flammable vegetation

b) **Parcels greater than five acres in size:**

Shall be provided with **30-foot fuelbreaks and 15-foot crossbreaks**, (see "h" and "i" below). Crossbreaks should divide the parcel into approximately 5-acre sections. **Fencelines may require handmowing/weedeating to ensure completion of fuelbreak**. When terrain is too steep or rugged for a tractor, a handmowed fuelbreak may be required.

c) Fuelbreaks along roadways are required as part of the property line. Road right-of-ways shall be cleared for a minimum of **10 feet** from the edge of black top and **13'6" vertically**.

d) Active pastureland shall be provided with **15-foot wide fuelbreaks and crossbreaks** if a sufficient number of animals are present to steadily reduce height of grass during the summer months to 3 inches or less by the end of September. If not active, a 30-foot width is required for both fuelbreaks and crossbreaks.

e) Active cropland shall be provided with **15-foot fuelbreaks** or crossbreaks if the crop is to be harvested by mid-June. If later harvest, a **30-foot width** is required.

f) Orchards are to be maintained by complete abatement, including grass under the tree branches. This may require pruning of lower branches to allow equipment access.

g) Tree litter (eucalyptus leaves and bark, coniferous needles, etc.) shall be removed from the base of trees, tree stems, and limbs within 10' of the ground and maintained throughout the fire season.

h) 30-foot fuelbreaks must be around all structures, combustible storage, trees, shrubs and brush, **along all ridges**, each side of all roads, fencelines, ditches and creeks. Fuelbreaks and crossbreaks are a continuous strip of disced or dozed ground following as closely as possible to the property line, and along one side of all fencelines, ditches, and on top of all ridges. Remove from the property all rubble, junk, piles of dirt, etc., which would obstruct or impede vehicles and equipment used for abatement work or fire suppression.

i) Mowed fuelbreaks are required to be 40 feet wide and crossbreaks 20 feet wide due to ability of fire to cross remaining surface material.

DISCING QUALITY:

All discing work, including fuelbreaks, shall be completed so that all weeds, grass, crops or other vegetation or organic material, which could be expected to burn, shall be completely removed or turned under so there is insufficient fuel to sustain or allow the spread of fire.

Certain properties may require additional or more stringent abatement because of special problems of terrain, growth, location, land use, or fire history of the property.

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