APPENDIX C

PROPOSED DRAFT WETLAND MITIGATION AND MONITORING PLAN AND VALLEY ELDERBERRY LONGHORN BEETLE MITIGATION PLAN

Mitigation and Monitoring Plan

For

Rio Del Oro

Sacramento County, California

January 18, 2006

Prepared for:
Elliott Homes, Inc.
and
GenCorp Real Estate

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

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SUMMARY

This mitigation and monitoring plan has been prepared for the Rio del Oro project as required by the U.S. Army Corps of Engineers.

The project is located in Sacramento County, California. There are a total of 56.632 acres of waters of the U.S. on-site, including 35.485 acres of vernal pool, 3.540 acres of ponds, 6.044 acres of seasonal wetland swale, 6.418 acres of seasonal wetland, and 5.145 acre of ephemeral drainage. Of these 56.632 acres, 30.328 acres will be impacted. A total of 12.946 acres of non-jurisdictional (isolated) aquatic features also occur on the project site, including 2.414 acres of vernal pool, 0.721 acre of pond, 0.653 acre of seasonal wetland swale and 9.158 acres of seasonal wetland. These features occur primarily within the dredger tailings that cover much of the project site. The project consists of grading and filling to establish construction grade and the installation of infrastructure for mixed land use on the 3828+ acre parcel.

As part of project implementation, a 507-acre area located in the southern portion of the project that contains the highest quality and density of vernal pools will be set aside as a Wetland Preserve. In addition to the 18.234 acres of preserved vernal pools, 20.279 acres of vernal pools will be created in the Preserve. An additional 19.5 acres of seasonal wetland mitigation will be constructed within the on-site detention basins. Wetland habitat will also be created within the major drainage corridors on the site. These corridors will contain 6.53 acres of low-flow channels, and 12.30 acres of emergent marsh and riparian habitat. The mitigation wetlands will be monitored for a 5-year period. Specific success criteria have been set forth in this document. The wetland preserve area will be permanently fenced and will be protected by Deed Restrictions and Conservation Easements. It is to be managed as wetland/wildlife habitat in perpetuity. Long-term monitoring and maintenance funding will be provided through a Community Facilities District or other similar mechanism such as a Mello-Roos District and carried out by the City of Rancho Cordova or other public agency.

PROJECT DESCRIPTION

Responsible Parties

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Present owner of mitigation site:

Elliott Homes, Inc. and GenCorp Real Estate

Expected long-term owner of the mitigation site:

City of Rancho Cordova or other public agency

Parties responsible for long-term maintenance of the mitigation site:

City of Rancho Cordova or other public agency

Location of Project

The 3828-acre project site (Assessor's Parcel No. 072-0370-036,043,045-048,066,067,070,071, 072-0440-003,005-016, and 072-0540-023) is located south of White Rock Road, north of Douglas Road, and east of Sunrise Boulevard in Sacramento County, California. The site corresponds to portions of Sections 5, 6, 7, 8, 9, and 10 of Township 8 North, Range 7 East, on the "Carmichael, California" U.S. Geological Survey 7.5-minute quadrangle and portions of Sections 31 and 32 of Township 9 North, Range 7 East, on the "Buffalo Creek, California" U.S. Geological Survey 7.5-minute quadrangle (Figure 1 – *Project Site and Vicinity*).

Brief Description of Overall Project

The proposed project consists of grading and filling to establish construction grade and installation of infrastructure for a master-planned community on the 3828+acre parcel (Figure 2 – *Land Use Plan*). The proposed land use plan would include high, medium, and low-density residential, retail/commercial, office, park, schools, wetland preserve and open space.

Jurisdictional Areas to be Filled

The project will permanently impact approximately 30.328 acres of waters of the U.S., composed of vernal pool (17.277 acres), pond (2.923 acres), seasonal wetland swale (3.509 acres), seasonal wetland (3.064 acres), and ephemeral drainage (3.555 acres) to be filled during construction grading.

Non-Jurisdictional Aquatic resources to be Filled

The project will permanently impact 12.946 acres of isolated wetlands, composed of 2.414 acres of vernal pool, 0.721 acre of pond, 0.653 acre of seasonal wetland swale and 9.158 acres of seasonal wetland.

Types, Functions and Values of the Jurisdictional Areas on the Project Site To Be Directly and Indirectly Impacted

Types

The following table provides acreage of the wetlands and other waters of the U.S. that would be impacted by the proposed project. Descriptions of wetland categories follow.

Table 1 - Waters/Wetlands Existing, Preserve, and Impact

Wetland Type	Existing	Preserve	Impact
Wetlands			
Vernal pool	35.485	18.234	17.277
Pond	3.540	0.617	2.923
Seasonal wetland swale	6.044	2.445	3.509
Seasonal wetland	6.418	3.354	3.064
Other Waters of the U.S.			
Ephemeral drainage	5.145	1.590	3.555
Total:	**56.632**	**26.240**	**30.328**

Functions, Values, and Baseline Information

A delineation of the project site was first conducted by Gibson and Skordal in 1999 and revised by ECORP Consulting, Inc. on October 21, 2004 (Figure 3 – *Wetland Delineation*). The delineation was verified by the U.S. Army Corps of Engineers on January 10, 2005. A total of 56.632 acres of waters of the U.S. are located within the project site. In addition, 12.946 acres of non-jurisdictional wetlands were identified on the site.

Vernal Pools

Vernal pools are poorly drained, isolated depressions that occur within the annual grassland landscape. Vernal pools are fed by direct rainfall or surface run-off. Water ponds for several weeks at a time during the rainy season and may dry completely between storm events.

In the Mediterranean climate of California's Central Valley, fall rains initiate the "wetting" stage, during which seeds germinate and dormant perennials re-sprout. As soils saturate and standing water accumulates, the pool enters the "aquatic" phase. Inundation may be periodic or continuous, and this variability supports a diverse plant and animal community. As water levels recede, primarily through evaporation, the "drying" phase begins during which pool basins begin drying and plant flowering reaches its peak, followed by the setting of seeds. The final phase is the "drought" phase, which is characterized by dry soils and dead or dormant vegetation. Since vernal pools hold ponded water and have emergent vegetation, they are responsible for some nutrient uptake/transformation. However, because of the brief period of inundation of the vernal pools on the site, it is unlikely that the pool provides any significant contribution to overall regional water quality (i.e., minimal effects on groundwater recharge, flood flows, or sediment stabilization).

There are numerous vernal pools throughout the annual grassland habitat portions of the project site, particularly in the non-mined areas. Vernal pools are types of shallow seasonal wetland depression that are typically dominated by annual native wetland plant species adapted to an annual wet/dry cycle. Vernal pools are flooded in the winter and spring but completely dry by summer. On-site vernal pools vary in maximum water depth from a couple of inches to 18 inches deep, and they range from 0.002 to 1.3 acres in size. Due to the timing of this wetland delineation, many of the species that ordinarily occupy the vernal pools during the wet season were lacking or their remains were not identifiable to species. Plant species observed within vernal pools include Carter's buttercup (*Ranunculus bonariensis*), Vasey's coyote-thistle (*Eryngium vaseyi*), creeping spikerush (*Eleocharis macrostachya*), and slender popcorn-flower (*Plagiobothrys stipitatus*). Typical wildlife associated with vernal pools includes various aquatic invertebrates and amphibians such as the pacific chorus frog.

The vernal pool fairy shrimp (*Branchinecta lynchi*) and vernal pool tadpole shrimp (*Lepidurus packardi*), listed as threatened and endangered (respectively), pursuant to the federal Endangered Species Act, are known to occur within several vernal pools in project area. Two years of wet season surveys have been performed on the site, and vernal pool tadpole and fairy shrimp were located in the open grassland habitat along the outer edges of the project site.

Seasonal Wetland and Seasonal Wetland Swale

Seasonal wetlands are scattered throughout out both the mined and non-mined areas of the project site. These seasonal wetlands are ephemerally wet areas that are usually underlain by clay or a heavy clay loam that act to suspend runoff within low-lying areas. They become inundated during the winter and fall but dry completely during the summer months. Unlike vernal pool wetlands, vegetation inhabiting on-site seasonal wetlands is predominately non-native wetland generalist plants such as Italian ryegrass (*Lolium multiflorum*), barley (*Hordeum murinum*), dock (*Rumex* spp.) rabbits-foot grass (*Polypogon monspeliensis*). Less common are native species such as Baltic rush (*Juncus balticus*) and creeping spikerush (*Eleocharis macrostachya*). Many of the seasonal wetlands that occur within the cobble tailings low areas also contain woody species such as willow and cottonwood. The vegetation in seasonal wetlands can function to remove/transform nutrients, as well as help with sediment stabilization. However, due to the size of these wetlands and the relatively low amount of water conveyed through this habitat, contribution to overall regional water quality is relatively low (i.e., minimal effects on groundwater recharge or flood flows).

Various seasonal wetland swales are located on the project site and consist of shallow, ephemerally wet areas that convey water between larger drainages or other wetland/water features during storm events. They occur as linear wetland features but lack bed-and-bank, and are lined with vegetated. Portions of a swale remain saturated into the growing season, support some hydrophytic vegetation, and exhibit hydric soil characteristics. The vegetation community of on-site swales consists primarily of non-native wetland generalist plants such as Italian ryegrass and Mediterranean barley, dock, as well as native annual species including coyote thistle.

When inundated, these seasonal wetlands potentially provide habitat for aquatic invertebrates and amphibians. For most of the remainder of the year, wildlife usage is similar to that of typical Central Valley non-native annual grassland habitat.

The isolated seasonal wetlands can provide habitat for vernal pool fairy and/or tadpole shrimp (*Branchinecta lynchi* and/or *Lepidurus packardi*, respectively). Some of the seasonal wetland depressions on the site have been considered potential habitat for listed crustaceans.

Pond

Several wetland features identified as ponds are present within the project site and consist primarily of modified or excavated basins or impounded drainages. They currently provide water for cattle grazing. For the most part, the ponds are seasonally inundated yet they hold water significantly longer than other seasonal wetland types. Several may even remain inundated throughout the year. The ponds largely lack emergent vegetation except for scarce individuals that exist around the high water mark.

Ponds can contribute to water quality through nutrient removal/transformation, collections of flood waters during local storm events, and reduction in sediment loads and turbidity. Many wildlife species are likely to use the stock ponds throughout the year and these may include great egret (*Ardea alba*), great blue heron (*A. nerodias*), belted kingfisher (*Ceryle alcyone*), bullfrog (*Rana catesbeiana*), and Pacific chorus frog. These ponds can be particularly important to wildlife seeking water during summer months, when other features have dried down.

Ephemeral Drainage

Ephemeral drainages are linear features that provide a conduit to flow during storm events. In general, they exhibit bed-and-bank characteristics and are largely un-vegetated due to the depth and scouring effects of flowing water. Occasionally however, some hydrophytic vegetation is present along the upper edges, and in areas where sediment accumulation provides suitable substrate for plant establishment. The dominant ephemeral drainage located on-site is Morrison Creek which runs from east to west through the southern section of the site and is identified on the U.S.G.S topographic map as a blue line feature. Ultimately, this feature drains into Mather Lake, located southwest from the Rio del Oro Project Area. Several other smaller sections of ephemeral drainages were mapped in the Project Area. They consist

originally of seasonal wetland swale features that have eroded and developed bed-and-bank characteristics.

The channels are important to water quality in that they collect sheet flows and water from local storm events into larger drainages and tributaries. Depending on the flow capacity, the channels may also contribute to overall regional water quality in terms of nutrient transformation and sediment stabilization.

Recreational Use / Public Access

The recreational uses of the drainages, seasonal wetlands, vernal pool habitats are limited to a few non-consumptive uses, primarily the aesthetic value during the spring and providing opportunities for activities such as birding. However, since the site is private property, such uses are minimal.

Soils

There are eleven different soils types mapped for the project area. Soil series mapped by the Natural Resource Conservation Service for the site include (145) Fiddyment fine sandy loam, 1-8% slopes; (158) Hicksville loam, occasionally flooded, 0-2% slopes; (159) Hicksville gravelly loam, 0-2% slopes; (181) Natomas loam, 0-2% slopes; (191) Red Bluff loam, 0-2% slopes; (192) Red Bluff loam, 2-5% slopes; (193) Red Bluff Loam, 0-5% slopes; (196) Red Bluff-Xerorthents, dredge tailing complex, 2-5% slopes; (198) Redding gravelly loam, 0-8% slopes; (223) Slickens; and (245) Xerorthent, dredge tailings, 2-50% slopes (Figure 4 – *NRCS Soil Types*). The Fiddyment, Hicksville, Natomas, Red Bluff, and Redding soils occur in the grasslands within areas which have not been disturbed by historic mining activities. The Slickens and Xerorthent dredge tailings soils occur with areas that have been substantially disturbed by historic mining activities.

GOAL OF MITIGATION

The overall goal of the proposed mitigation for the Rio del Oro project is to achieve no net loss of wetland functions and values as well as riparian habitat. This goal will be accomplished through a combination of on-site preservation and creation. On-site mitigation planned for the site is creation of 20.279 acres of vernal pools, 12.30 acres of seasonal/riparian wetland, 6.53 acres of channel, and 19.5 acres of seasonal wetland (Figure 5 and Attachment A – *Wetland Preserve, Impact and Compensation Plan*). Vernal pools creation will occur within the proposed 507-acre Wetland Preserve, where a total of 18.234 acres of vernal pools will be preserved. This area contains the highest quality and density of vernal pools on the project site. In addition, the preserve area contains a majority of the undisturbed area on the project site; most of the remainder of the site has been historically mined, and is currently dredger tailings.

Types

The following table summarizes acreage of the wetlands and other Waters of the United States that would be impacted, preserved and created by the proposed compensation project. Descriptions of the compensation wetlands follow.

Table 2 - Waters/Wetlands, Existing, Avoidance, Impact, and Compensation Acreage

Wetland Type	Existing Acres	Impact		On-site Preservation Acres	On-Site Creation Acres
		Jurisdictional Acres	Isolated Acres		
Vernal Pool	35.485	17.277	2.414	18.234	20.279
Pond	3.54	2.923	0.721	0.617	0
Seasonal wetland swale	6.044	3.509	0.653	2.445	0
Seasonal wetland	6.418	3.064	9.158	3.354	19.5
Ephemeral drainages	5.145	3.555		1.59	0
Riparian wetland	---	---		---	12.302
Channel	---	---		---	6.534
Total	**56.632**	**30.328**	**12.946**	**26.24**	**58.615**
		Total Impact:	**43.274**		

Characteristics, Functions and Values of Habitat to be Created/Enhanced

On-Site Mitigation

The functions and values of the habitat to be created or enhanced on-site will be designed to mimic those of the impacted habitats on the project site.

A 507-acre vernal pool preserve area will be designated in the southern portion of the project site (Figure 6 – *Conceptual Vernal Pool Preserve*). This area contains the highest concentration of hig-value vernal pools on the project site. Approximately 18.234 acres (over one-half the total acreage of jurisdictional vernal pools) are located within the proposed preserve. Vernal pool creation totaling 17.867 acres (maintaining approximately 250' buffers from existing vernal pool features) would occur within this preserve area also. Other wetland features currently existing within the preserve include: 2.445 acre of seasonal wetland swale, 3.354 acres of seasonal wetland, 1.590 acres of ephemeral drainage, and 0.617 acre of pond. The portion of Morrison Creek located within this area will be preserved.

The wetland preserve is being designed to maximize protection of existing and compensatory vernal pool habitat. Drainage will be designed so that summer nuisance flows are directed to low-flow channels to be constructed along the perimeter of the preserve that will parallel a proposed trail system. The preserve configuration was also designed to maintain existing hydrology to preserved and compensatory vernal pool habitat. Development areas adjacent to the preserve generally flow away from the preserve and will not compromise the hydrology of the protected resources.

In addition to the wetland preserve area, 186 acres of drainage corridors and open space will be established on the project site. The corridors will range from 200 to 300 feet wide and will consist of a meandering low-flow channel, adjacent wetlands, riparian plantings and a bike trail (Figure 7 – *Conceptual Corridor Plan*). These corridors will reestablish defined drainageways for the site which have not been present since the dredging operations completely altered the character and topography of the majority of the site. It is anticipated that riparian habitat

established adjacent to the reestablished corridors will offset mitigation requirements that may be required by the California Department of Fish and Game.

Three detention basins (7,6, 26 acres) will be constructed on the project site for flood protection. Seasonal wetlands will be constructed within the 6- and 26-acre detention basin that are contiguous with the reestablished corridors.

Evaluation of Temporal Losses

The created habitat should begin functioning hydrologically during the first rainy season after completion of the excavation and countouring of the compensation wetlands. Substantial vegetative cover within the wetland features is expected to be established within two years after construction. It is also expected to increase annually and reach the established performance standards within three to five years. In order to compensate for temporal losses, the 507-acre vernal pool mitigation area and 26-acre detention basin area will be established concurrent with Phase 1 impacts.

PROPOSED (ON-SITE) MITIGATION SITE

Mitigation Site

A 507-acre Wetland Preserve will be located in the southern portion of the project. In addition, a two detention basins will contain seasonal wetland habitat, and several drainage corridors will also be established throughout the project as mitigation.

Ownership Status

Present owner of the mitigation site:
Elliott Homes, Inc. and GenCorp Real Estate

Expected long-term owner of the mitigation site:
City of Rancho Cordova

Parties responsible for long-term maintenance of the mitigation site:

City of Rancho Cordova or other public agency

Point of Contact for Corps Access to the Site:

During construction and 5-year monitoring: Elliott Homes, Inc. and GenCorp Real Estate

Following Corps Sign-off: City of Rancho Cordova or other public agency

Deed Restrictions and Conservation Easements:

Deed restrictions and conservation easements will be recorded that will require that the on-site constructed wetland and open space areas are maintained as wetland and wildlife habitat in perpetuity. Copies of proposed language will be submitted to the Corps for approval prior to recordation and copies of the recorded documents will be provided to the Corps no later than 30 days subsequent to recordation. In addition, recordation will occur prior to the start of project construction.

Existing Functions, Values, Baseline Information of Mitigation Sites

The existing functions and values of the mitigation site are the same as for the habitats to be impacted, as the mitigation site within the same watershed and compensatory habitat will be designed to mimic those affect by project implementation.

Present Use of Mitigation Area

The proposed mitigation area (within the project site) is currently fallow undeveloped property and is currently use for cattle grazing. The proposed mitigation area has existing wetland features including 18.234 acres of vernal pools, 0.617 acres of seasonal wetland swale, 3.354 acres of seasonal wetland, 1.590 acres of ephemeral drainage, and 0.617 acre of pond.

Jurisdictional Delineation

The jurisdictional delineation for the mitigation site is included in the delineation for the entire project site.

Present and Proposed Uses of All Adjacent Areas

Adjacent land use in areas surrounding the mitigation site is at present agricultural to the east, north and south, and light industrial to the west. The permit for which this mitigation plan has been developed authorizes mixed-use development to north and west. Residential development is also proposed south and east of the project.

Zoning

The Mitigation Area is currently zoned as industrial with aggregate resource overlay. The mitigation area will be rezoned as open space.

IMPLEMENTATION PLAN

Rationale for Expecting Implementation Success

ECORP Consulting, Inc. has successfully designed and overseen the construction of numerous other compensation wetlands in Sacramento County. This experience will be used in the design and construction of the compensation habitat for the Rio del Oro project. In addition, the mitigation will be constructed in proximity to existing, functioning features within an established watershed.

Responsible Parties

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Schedule

Grading is expected to begin immediately after all requirements for commencement of construction have been fulfilled.

As-Built Conditions

An aerial photo will be taken in the first winter after the wetlands have been constructed. The wetland areas will be digitized and wetland acreage will be calculated. This wetland "as-built" will be included in the annual monitoring reports and will verify that the mitigation acreages specified in the permit have been constructed. If there are significant changes from the original plans, these will be indicated in indelible red ink.

MAINTENANCE DURING MONITORING PERIOD

Maintenance Activities

In order to ensure that the constructed wetlands and preserved wetlands are adequately protected during construction, the following actions will be taken. First, the boundaries of entire area to be preserved will be temporarily fenced to insure that the area is not disturbed during the construction of the rest of the project. After project completion, permanent fencing will be installed along the perimeter of the entire preserve area. Fencing should be sufficient to prevent vehicle access into the area. Permanent signs identifying the open space area will be placed along the perimeter of the fence.

On-going maintenance activities will include trash removal, inspections for erosion control problems, inspections for invasion of exotic species, repair/replacement of fencing and signage, and inspections for vandalism. If necessary, for reasons such as obstruction of outfalls, flood protection, removal of exotic species, or thatch buildup, the removal of vegetation may be needed within the upland perimeter areas. If vegetation removal is required it will be conducted by hand. This action will be appropriately timed, and will be consistent with the Deed Restrictions and Conservation Easements governing the preserve. The condition of the channel will be evaluated during monitoring visits. The Corps will be notified if any action beyond this is required during the monitoring period. If thatch removal or extensive erosion control work is deemed necessary, the Corps will be provided with a plan for review, and Corps approval will be required prior to implementation. The deed restrictions and conservation easement outlining the permitted and prohibited activities, will be submitted to the appropriate agencies for review and approval.

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Schedule

Annual maintenance inspections of the channel will occur concurrently with other monitoring activities for the first five years after construction, or until mitigation success obligations have been met. Annually, biologists will evaluate the need for vegetation removal, including the removal of thatch, erosion control measures, trash removal, vandalism, and other maintenance activities. Inspections will be an ongoing activity and trash removal will occur as needed.

MONITORING PLAN

Vernal Pools

Final Success Criteria

The overall goal of mitigation is no net loss of wetland functions and values. This goal will be met through the creation of 17.867 acres of vernal pool and the preservation of 18.234 acres of vernal pool.

In order to judge whether or not the goal of no net loss of function and values has been met for the on-site compensation vernal pools, a set of final success criteria have been developed. These success criteria are based on the final goal of mitigation as creation of vernal pools with functions and values similar to the preserved vernal pool habitat. By comparing the preserved to the compensation habitat, we can ensure the functions and values of the impacted portion of the project are replaced. For the constructed vernal pool habitat, at the end of the monitoring period, it must meet specific success criteria, after three years of no human intervention, as listed in Table 3.

Table 3 – Success Criteria Compensation Vernal Pool

Hydrology:	1)	The maximum depth of the created vernal pools will not be greater than 18 inches.
Vegetation:	1)	The aerial coverage of vegetation for 90% of the created vernal pools must be equal to or greater than 85%, and the aerial coverage of vegetation for the remaining 10% of the created vernal pools must be 50-80%.
	2)	Species richness will equal or exceed 10 species.
	3)	The percentage of the total relative cover (as calculated by the sum of all the cover class mid-points) attributable to "vernal pool indicators" or "vernal pool associates"[1] must be as follows: 25% of the pools shall attain ≥90% total relative cover, 50% shall attain 75-90%, and 25% shall attain a value of ≥50%.
	4)	All dominant species (those with a Braun-Blanquet cover scale of 3 or greater) will be "vernal pool indicators" or "vernal pool associates."[1]

[1] As defined in the California Department of Fish and Game's list: *Catalog of Plant Species Known to be Associated with Vernal Pools* (CDFG 1997) or other vernal pool literature.

Target Jurisdictional Acreage to be Created/Enhanced

An aerial photo will be taken in the first winter after the wetlands have been constructed. The ponded wetland areas will be digitized and a wetland acreage will be calculated. This wetland "as-built" will be included in the annual monitoring reports and will verify that the mitigation acreages specified in the permit have been constructed.

Monitoring Methods

In order to determine if the constructed wetland are functioning properly, the following hydrology, vegetation, and wildlife monitoring program will be adopted.

Hydrology

The purpose of hydrologic monitoring is to determine if the constructed vernal pools are inundated for periods sufficient to support appropriate wetland biota. Staff gauges will be placed in 10% of the created vernal pools. Staff gauges will reflect a variety of created habitat depths. The exact placement of the gauges cannot be anticipated prior to creation, but the first monitoring report will include a map indicating actual locations. For comparison, staff gauges will also be placed in 5% of the on-site preserved vernal pools. Staff gauges will be read a minimum of three times between December 15th and June 15th of each monitoring season, with at least one reading occurring during the estimated period of maximum inundation (usually during January or February). In addition, a minimum of 50% of the created vernal pools will be randomly selected and biologists will record the maximum depth. During the final monitoring year, maximum depth will be recorded for 100% of the created vernal pools.

Aerial photographs will also be used for hydrologic monitoring. Two aerial photographs will be taken during each monitoring year. Photographs will be taken once during the peak period of inundation, typically during January or February and once when the vernal pool plants are flowering, typically April or May. Such aerial photographs give an excellent overview of the mitigation area and its micro-watershed. Aerial photographs can help identify areas that warrant additional attention during subsequent field visits. In particular, aerial photographs will be used to help identify: 1) areas that do not pond water, 2) areas that are ponding late in the season, and 3) off-site activities that may be affecting hydrologic function within the mitigation area. These aerial photos can also be used to estimate actual pool area for the constructed wetlands.

Floristics

Floristic surveys of created and preserved on-site vernal pools will be conducted each spring during peak flowering period. Timing of floristic surveys will be adjusted according to site specific conditions. Data collected from each monitored wetland will include an estimate of percent aerial vegetative cover, a cumulative species list, and an estimate of the relative cover of each species using the modified Braun-Blanquet cover estimate scale (0=<1%, 1=1-5%, 2=6-25%, 3=26-50%, 4=51-75%, and 5=76-100%). A cumulative plant species list will then be generated for each wetland.

Data from each monitored wetland will be entered into a database. From this database, the following will be calculated for each monitored wetland: number of species, number of wetland species, number of native species, number of dominant species (species with a Braun-Blanquet cover class of 3 or greater), the Prevalence Index, the number of "vernal pool indicators" and "vernal pool associates" with a Braun-Blanquet cover class of 2 or greater, the sum of all of the cover class mid-points, the sum of all of the native vernal pool species cover class mid-points, and the percentage of the overall relative native vernal pool species cover (as calculated by the sum of the cover class mid-points) attributable to native species.

Prior to the first season of monitoring, 25% of the created wetlands will be randomly selected. Each of these wetlands will be floristically monitored during each of the five monitoring years. During the second and fourth monitoring season, another 25% will be randomly selected for floristic monitoring. In addition, monitoring biologists will visit each created wetland every monitoring season and will monitor any additional wetlands that, by a subjective assessment, do not appear to be functioning properly (e.g., very low vegetative cover, dominance by non-native generalist species, etc.). For comparison, a random selection of existing vernal pools at the mitigation site will be monitored each year. During the final year of monitoring, 100% of the created vernal pools will be monitored.

Finally, in the first few monitoring years, the revegetation of the disturbed upland areas will be assessed, with particular attention given to assessing the spread of exotic non-native species such as yellow star-thistle (Centaurea solstitialis).

The Prevalence Index (PI) is a standard method used to determine whether a floristic data set can be categorized as being that of a wetland or an upland community. Plant species categories used to calculate the PI will be based upon those described by Reed (1997) and weighted according to Table 4.

Table 4 – Plant Species Category Weighting

Wetland Status	Weighting
Obligate Wetland (OBL)	1
Facultative Wetland (FACW)	2
Facultative (FAC)	3
Facultative Upland (FACU)	4
Obligate Upland (UPL)	5

The Prevalence Index for each wetland is calculated using the following formula:

$$PI = \frac{1*f(OBL) + 2*f(FACW) + 3*f(FAC) + 4*f(FACU) + 5*f(UPL)}{f(OBL) + f(FACW) + f(FAC) + f(FACU) + f(UPL)}$$

where: f(OBL) = a measure of abundance for OBL species,

f(FACW)= a measure of abundance for FACW species, etc.

The Prevalence Index is a standard method of determining whether a wetland data set is categorized as a wetland or upland plant community. To be considered a wetland, the area must have a PI value less than 3.0 (Federal Interagency Committee for Wetland Delineation, 1989). However, PI values within disturbed areas can range higher, depending on plant species.

Several supplemental summary statistics and indices will be calculated for the vernal pools, which are described below.

Relative Wetland Cover

Relative cover of wetland species is defined as the percentage of the total vegetative cover that is made up of wetland plant species within an individual wetland. Wetland species include

those categorized as obligate (OBL), facultative wetland (FACW), or facultative (FAC) (Reed 1988).[1]

Species Richness

Species richness is defined as the total number of plant species recorded within an individual wetland.

Wetland Species Richness

Wetland species richness is defined as the total number of wetland plant species recorded within an individual wetland. Wetland plants include those that are categorized as obligate (OBL), facultative wetland (FACW), or facultative (FAC) (Reed 1988).

Native Species Richness

Native species richness is defined as the number of native plant species found in an individual wetland.

Vascular Plant Species Frequency of Occurrence

Frequency of occurrence is defined as the number of pools in which a species is observed within a given preserve, divided by the number of pools sampled. For example, if 100 pools were surveyed and Species A was recorded in 37 of them, the frequency of occurrence of Species A would be 0.37.

[1] Categories found in the *National List of Plant Species That Occur in Wetlands: California (Region 0)* (Reed 1988):

Obligate Wetland (OBL)	= occur almost always in wetlands (>99% probability).
Facultative Wetland (FACW)	= usually occur in wetlands (67%-99% probability).
Facultative (FAC)	= equally likely to occur in wetlands and non-wetlands (34%-66% probability).
Facultative Upland (FACU)	= usually occur in non-wetlands (67%-99% probability).
Obligate Upland (UPL)	= occur almost always in non-wetlands (>99% probability).

Wildlife

Wildlife surveys will occur in conjunction with hydrologic and floristic monitoring visits. A biologist will walk a meandering transect through the compensation wetland area and generate a cumulative list of the type and number of all species observed utilizing the compensation wetland area. Wildlife signs, such as scat, pellets, or bones, will also be noted. In addition, any wildlife observed during hydrologic or vegetation monitoring surveys will be noted and included in an annual cumulative list of wildlife found within the Wetland Preserve.

Seasonal Wetlands

Final Success Criteria

The overall goal of mitigation is no net loss of wetland functions and values. This goal will be met through the creation of 19.5 acres of seasonal wetland within detention basins on the stie. The wetlands will be monitored over a period of 5 years or until success criteria have been met. At the end of the monitoring period, the constructed seasonal wetland must exhibit the range of functions and values described below Table 5. Once established criteria have been met and approved by the Corps, no further monitoring of the mitigation wetland will be required.

Table 5 – Success Criteria Compensation Seasonal Wetland

Performance Standard:	1) Wetland will be inundated or saturated for sufficient periods to support a predominance of wetland plant species (those listed as FAC, FACW, or OBL in *The National List of Plant Species that Occur in Wetlands: California (Region 0)* (Reed 1997).
Success Criteria:	1) 95% of the wetland acreage must be inundated or saturated for period of sufficient duration to support wetland vascular plants as the most prevalent and dominant component; 2) Prevalence Index will be less than 3.0; 3) The following annual minimum vegetative cover values will be met: Year 1: Minimum 10% relative cover Year 2: Minimum 30% relative cover Year 3: Minimum 50% relative cover Year 4: Minimum 60% relative cover Year 5: Greater than or equal to 70% relative cover

Target Jurisdictional Acreage to be Created/Enhanced

An aerial photo will be taken in the first winter after the wetlands have been constructed. The ponded wetland areas will be digitized and a wetland acreage will be calculated. This wetland "as-built" will be included in the annual monitoring reports and will verify that the mitigation acreages specified in the permit have been constructed.

Monitoring Methods

In order to determine if the constructed wetland are functioning properly, the following hydrology, vegetation, and wildlife monitoring program will be adopted.

Hydrology

The purpose of hydrologic monitoring is to determine if the constructed seasonal wetlands are inundated for periods sufficient to support appropriate wetland biota.

Aerial photographs will also be used for hydrologic monitoring. Two aerial photographs will be taken during each monitoring year. Photographs will be taken once during the peak period of inundation, typically during January or February and once when the vernal pool plants are flowering, typically April or May. Such aerial photographs give an excellent overview of the mitigation area and its micro-watershed. Aerial photographs can help identify areas that warrant additional attention during subsequent field visits. In particular, aerial photographs will be used to help identify: 1) areas that do not pond water, 2) areas that are ponding late in the season, and 3) off-site activities that may be affecting hydrologic function within the mitigation area. These aerial photos can also be used to estimate actual pool area for the constructed wetlands.

Floristics

To collect vegetation data from the constructed seasonal wetland, a point-intercept sampling procedure will be used (Federal Interagency Committee for Wetland Delineation 1989). During

the first monitoring season, baseline transects will be established that run the length of the constructed feature. To create a potential starting points along this baseline, the start of each one-foot interval with be considered our baseline grid. After determining the length (in feet) of the baseline transect, a random number table will be used to select three starting points for data collection. Beginning at each randomly selected starting point, a pen or pencil will be spun in the air and, when it falls, the direction it is pointing will be the direction of that data collection transect. For each of these data collection transects, all of the plants present at points located at two-foot intervals along that transect will be recorded. If there is more than one plant vertically, both should be recorded. If there are no plants present the point will be noted as bare ground but excluded from subsequent calculations.

Once the data has been collected, each species will be assigned the appropriate indicator status (i.e., OBL, FACW, FAC, FACU, and UPL). Then, for each transect, the frequency of occurrence of plants in each of the indicator status categories will be calculated. These data will be plugged in the standard Prevalence Index calculation:

$$PI = \frac{(1.0*F1) + (2.0*F2) + (3.0*F3) + (4.0*F4) + (5.0*F5)}{\sum (F1 + F2 + F3 + F4 + F5)}$$

where: F1 = Frequency of occurrence for OBL species
F2 = Frequency of occurrence for FACW species
F3 = Frequency of occurrence for FAC species
F4 = Frequency of occurrence for FACU
F5 = Frequency of occurrence for UPL and other species not meeting above categories

Using the resulting three PI values, the standard error will be calculated. If the standard error is greater than 0.20, then additional randomly selected transects (up to a maximum of three) will be sampled. Once the standard error is 0.20 or less or a total of six transects have been sampled, a mean PI will be calculated for the constructed wetland.

In addition to the PI data collection, an estimate of total vegetative cover will be made by visual assessment. This value is based upon aerial coverage of the total vegetative aggregate and

excludes the cover of non-vegetative components such as bare ground, rocks, and algal matting.

Wildlife

Wildlife surveys will occur in conjunction with hydrologic and floristic monitoring visits. A biologist will walk a meandering transect through the compensation wetland area and generate a cumulative list of the type and number of all species observed utilizing the compensation wetland area. Wildlife signs, such as scat, pellets, or bones, will also be noted. In addition, any wildlife observed during hydrologic or vegetation monitoring surveys will be noted and included in an annual cumulative list of wildlife found within the Wetland Preserve.

Channel and Adjacent Wetlands

In order to judge whether or not the goal of no net loss of function and values has been met for the on-site compensation channel, a set of final success criteria have been developed for the constructed channel and associated seasonal wetland basins.

At the end of the monitoring period, the constructed channel must exhibit the range of functions and values described below. In addition, the channel habitat must meet specific success criteria, after three years of no human intervention, as listed in Table 6.

Table 6 – Success Criteria: Compensation Channel

Hydrology:	1)	Flows will be appropriate to support the establishment and dominance of hydrophytic vegetation.
Vegetation:	1)	Each wetland bench area will be dominated by hydrophytic vegetation.
	2)	Each wetland bench area will have a Prevalence Index of less than 3.0; and 90% of the realigned channel will be covered with hydrophytic vegetation or open water.
	3)	

Target Jurisdictional Acreage to be Created/Enhanced

An aerial photo will be taken in the first winter after the channel has been constructed. The ponded wetland areas will be digitized and a wetland acreage will be calculated. This wetland "as-built" will be included in the annual monitoring reports and will verify that the mitigation acreages specified in the permit have been constructed.

Monitoring Methods

In order to determine if the constructed wetlands are functioning properly, the following hydrology, vegetation, and wildlife monitoring program will be adopted.

Hydrology

Hydrology will be assessed twice annually, once during the peak period of inundation, typically during January or February and then again later in the season. Aerial photographs of the constructed wetland may be used to estimate the extent of inundation. Using the aerial photo, the channel will be ranked according to its approximate percent of inundation: 4 = channel is 100% inundated, 3 = channel $\geq$ 80% inundated, 2 = channel <80% and $\geq$ 50% inundated, 1 = channel <50% inundated, and 0 = channel not inundated. These aerial photos can also be used to estimate actual area for the constructed channel habitat. Hydrology may also be assessed by direct observation during appropriately timed site visits.

Vegetation

In order to accurately evaluate the performance of the compensation channel as well as the wetland benches, two methods of monitoring will be used, the point-intercept method (for the channel) and the species list/percent cover method (for the seasonal wetland benches). Floristic surveys of created and preserved on-site vernal pools will be conducted each spring during peak flowering period. Timing of floristic surveys will be adjusted according to site specific conditions.

Three transects will be randomly selected within the constructed wetland channel. Plant species data will be collected by the point-intercept sampling method at one-foot intervals along each transect. All plant species (or bare ground where no plants are present) at the one-foot interval will be recorded. The prevalence index and the percent vegetative cover will be calculated.

Floristic data will also be collected for the created seasonal wetland benches within the channel. A species list and an estimate of the cover of each species present will be collected. The cover estimate will be based upon the Braun-Blanquet scale. In addition, an estimate of total vegetative cover will be made by visual assessment. This value will be based upon aerial coverage of the total vegetative aggregate, excluding non-vegetative cover such as bare ground, rocks and algal matting. Data from each monitored bench will be entered into a database. From this database, the following will be calculated for each monitored wetland: relative wetland cover, species richness, native species richness, Prevalence Index (PI), and vascular plant species frequency of occurrence.

Riparian Plantings

In order to judge whether or not the riparian plantings have become successfully established, a set of final success criteria have been developed for the plantings.

At the end of the monitoring period, the plantings should exhibit the range of functions and values described below. The success criteria for the riparian plantings is listed in Table 7.

Table 7 – Success Criteria: Riparian Plantings

Vegetation:	1) No less than 90% annual survival for each of the initial two years of monitoring; 2) No less than 60% cumulative survival at the end of five years; and 3) 70% of the species originally planted will be present at the end of five years.

Target Jurisdictional Acreage to be Created/Enhanced

An aerial photo will be taken in the first winter after the channel has been constructed. The ponded wetland areas will be digitized and a wetland acreage will be calculated. This wetland

"as-built" will be included in the annual monitoring reports and will verify that the mitigation acreages specified in the permit have been constructed.

Monitoring Methods

Monitoring will be conducted once annually toward the end of the dry season (i.e., July or August) after the plantings have experienced high stress conditions. This time frame will ensure greater accuracy in determining plant condition and survivorship. During monitoring, each planting will be located and its condition will be recorded.

In the field, plant condition will be scored on a scale of 0 to 3, where:

Score	Plant Condition
0	dead,
1	alive but with a few green leaves and no apical growth,
2	alive with healthy foliage but minimal apical growth,
3	alive and growing vigorously

These data will be entered into a spreadsheet for analysis. Results calculated will include the total number of plantings monitored (live plants and dead plants), total plantings found alive, annual survival rates for both individual species and for the plantings as a whole, and the overall cumulative survival rate as calculated below.

The annual survival rate will be calculated according to the following formula:

$$\text{Annual Survival Rate (\%)} = \frac{\text{total \# alive during survey}}{\text{total \# alive in previous season}} \times 100$$

The cumulative survival rate will be calculated according to the following formula:

$$\text{Cumulative Survival Rate (\%)} = \frac{\text{total \# alive during survey}}{\text{total \# proposed for planting}} \times 100$$

At the end of each monitoring season, the annual and cumulative survival rate will be determined. Should the annual survival rate fall below the accepted level of 90 percent within either of the initial two years of monitoring, additional plantings should be planted to ensure that the overall success criteria are met. At the end of the five-year monitoring period, the riparian plantings will be evaluated to determine if success criteria (discussed below) have been met. If determined to be successful, no further monitoring will be required.

Annual Reports

Monitoring reports will be submitted to the U.S. Army Corps of Engineers. Reports will present the status of the constructed wetland features, including wetland data, photo-documentation, and any recommended remediation. In addition, they will include an assessment of the monitoring results against the success criteria described above. At the end of the five-year monitoring period, monitoring will cease, if the project is found by the Corps to be in substantial compliance with established success criteria. Monitoring will be extended beyond the five-year period only if the wetland has not met the success criteria.

Schedule

Monitoring will begin the first growing season following construction of the realigned tributary and will continue for five years or three years after human intervention, whichever is longer. Monitoring reports will be submitted by December 31st of each monitoring year.

COMPLETION OF MITIGATION

Notification of Completion

When the initial monitoring period is complete, and if the applicant believes that the final success criteria have been met, the applicant shall notify the Corps when submitting the final annual report that documents this completion. If appropriate, a current delineation of the created wetland area will be submitted with the report, along with copies of field data sheets.

Corps Confirmation

Following receipt of the report, the Corps may require a site visit to confirm the completion of the mitigation effort.

CONTINGENCY MEASURES

Initiating Procedures

If any annual performance criterion is not met for all or any portion of the mitigation project in any year, or if the final success criteria are not met, the applicant shall prepare an analysis of the cause or causes of failure, and if deemed necessary by the Corps, propose remedial action for approval. If the mitigation site has not met the performance criterion, the responsible party's maintenance and monitoring obligations continue until the Corps gives final project confirmation.

Alternative Locations for Contingency Mitigation

A feasibility study will be done prior to the construction of the compensation tributary on-site. If results of this study indicate that the proposed wetland construction site will not support the desired habitat, then another Corps approved site and/or a Corps approved mitigation bank or off-site mitigation facility will be used for the remaining mitigation requirements.

Funding Mechanism

All funding will be provided by the applicant.

LIST OF FIGURES

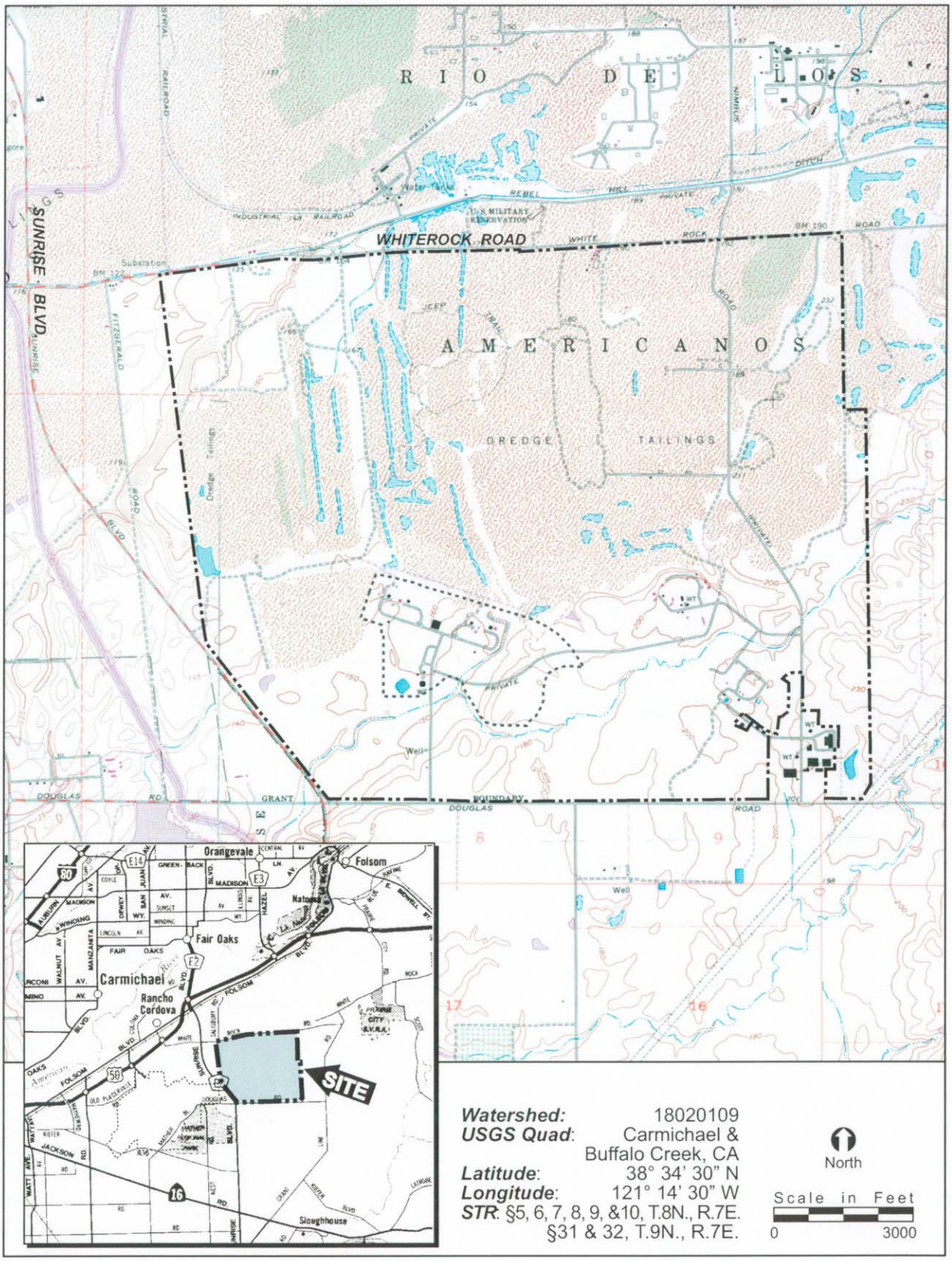

FIGURE 1. Project Site and Vicinity Map

2002-009 Rio del Oro

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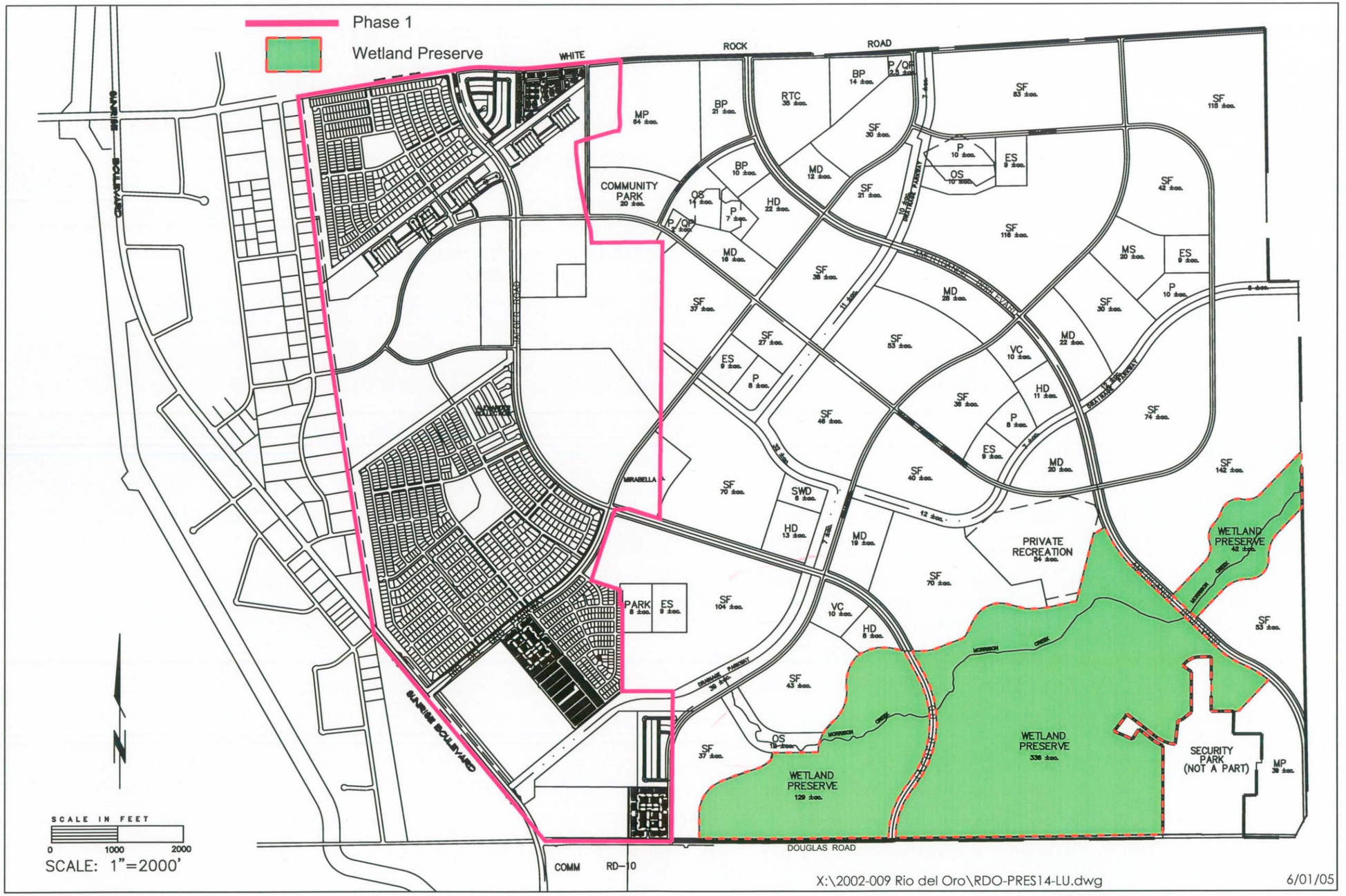

FIGURE 2. Land Use Plan

ECORP Consulting, Inc.
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CLASSIFICATION	JURISDICTIONAL ACREAGE	ISOLATED ACREAGE	EXISTING ACREAGE
Wetlands:			
Vernal Pool	35.485	2.414	37.899
Pond	3.540	0.721	4.261
Seasonal Wetland Swale	6.044	0.653	6.697
Seasonal Wetland	6.418	9.158	15.576
Other Waters:			
Ephemeral drainage	5.145	--	5.145
TOTAL:	56.632	12.946	69.578

Phase 1

Isolated wetlands

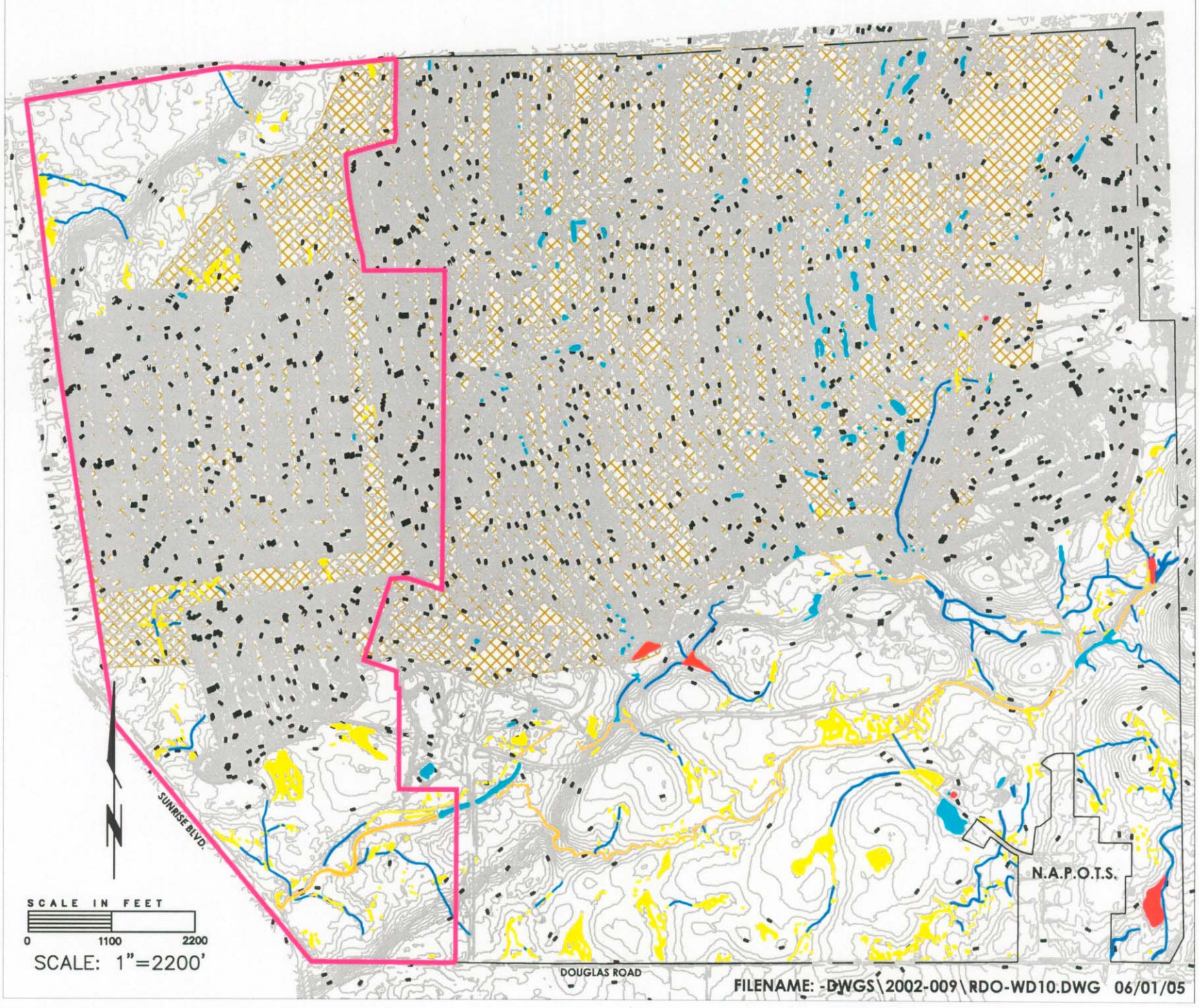

FIGURE 3. Wetland Delineation

2002-009 Rio Del Oro

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145	Fiddyment fine sandy loam, 1-8% slopes
158*	Hicksville loam, occassionally flooded, 0-2% slopes
159*	Hicksville gravelly loam, occasionally flooded, 0-2% slopes
181	Natomas loam, 0-2% slopes
191*	Red Bluff loam, 0-2% slopes
192*	Red Bluff loam, 2-5% slopes
193*	Red Bluff - Redding complex, 0-5% slopes
196*	Red Bluff-Xerorthents, 2-50% slopes
198*	Redding gravelly loam, 0-8% slopes
223**	Slickens
245*	Xerorthents, dredge tailings, 2-50% slope

North

Scale in Feet

0 3000

* Soil unit contains listed hydric inclusions.
** Soil unit contists of listed hydric components.

NRCS Soil Survey, Sacramento County, California, 1993.

FIGURE 4. NRCS Soil Types

WATERS OF THE U.S. ACREAGE

WETLAND TYPE	EXISTING ACREAGE	IMPACTS [1] JURISDICTIONAL	IMPACTS [1] ISOLATED	ON-SITE PRESERVE	ON-SITE CREATION
Wetlands:					
Vernal Pool	35.485	17.277	2.414	18.234	20.279
Pond	3.540	2.923	0.721	0.617	N/A 0.000
Seasonal Wetland Swale	6.044	3.509	0.653	2.445	N/A 0.000
Seasonal Wetland	6.418	3.084	9.158	3.354	N/A 19.500
Other Waters:					
Ephemeral Drainage	5.145	3.555		1.590	N/A 0.000
Seasonal/Riparian Wetland	---	---		---	12.302 [3]
Channel	---	---		---	6.534 [3]
TOTAL:	56.632	30.328	12.946	26.240	58.615

Project Boundary

Line of Indirect Impact

●100 Elderberry Location and ID#

Open Space (+/- 201 ac.)

VELB Preserve (+/- 24 ac.)

Park

Isolated Wetlands

Wetland Preserve (+/- 507 ac.)

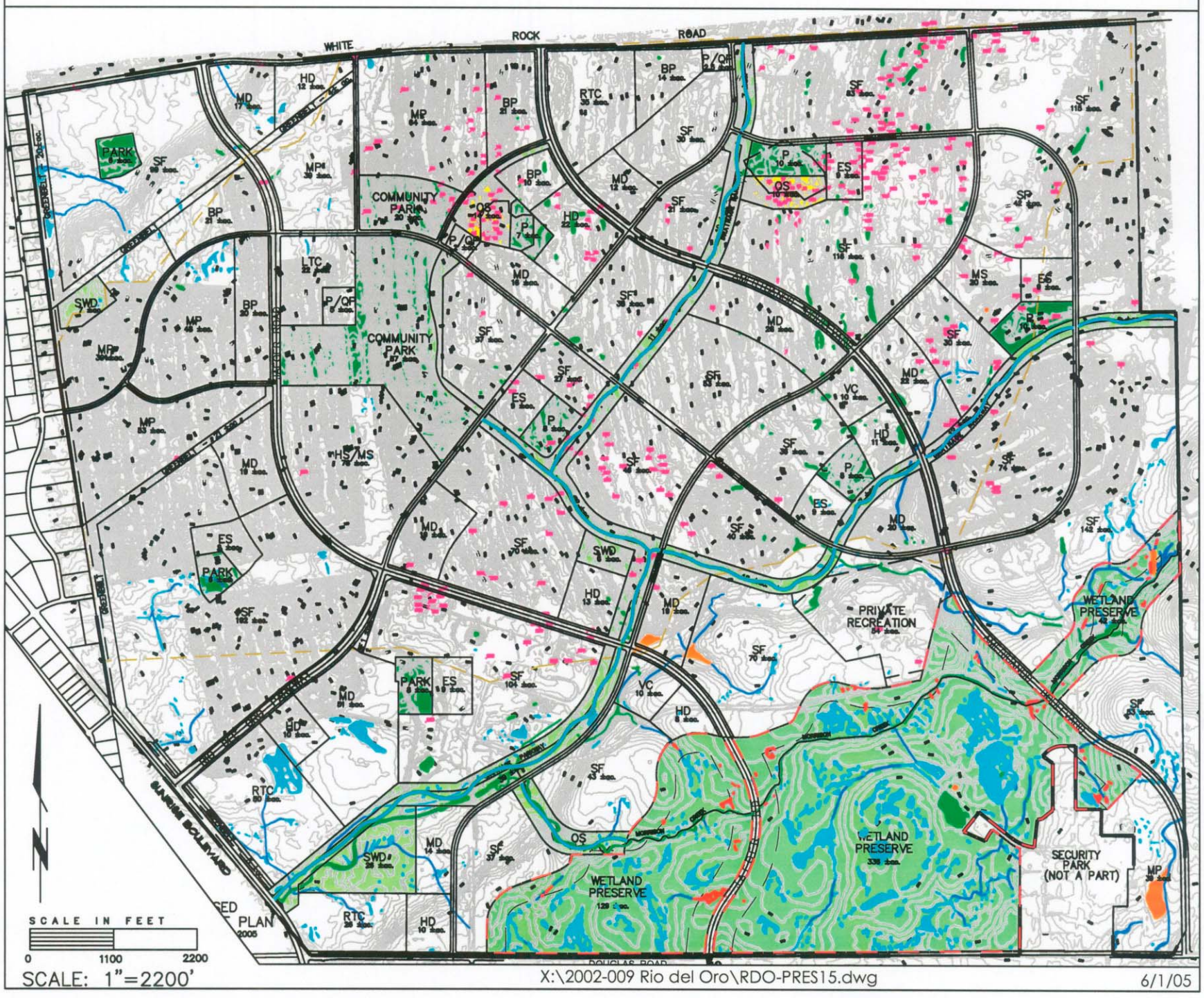

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FIGURE 5. Preserve/Impact Map

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CLASSIFICATION	MITIGATION PRESERVE	MITIGATION CREATION
Wetlands:		
Vernal Pool		
Pond		N/A
Seasonal Wetland Swale		N/A
Seasonal Wetland		N/A
Other Waters:		
Ephemeral Drainage		N/A

SCALE IN FEET
0 500 1000
SCALE: 1"=1000'

SF 74 ±ac.
MD 20 ±ac.
SF 142 ±ac.
PRIVATE RECREATION 54 ±ac.
WETLAND PRESERVE 42 ±ac.
AMERICANOS BOULEVARD
MORRISON CREEK
ES 9 ±ac.
SF 104 ±ac.
VC 10 ±ac.
HD 8 ±ac.
SF 53 ±ac.
PARKWAY
39 ±ac.
SF 43 ±ac.
OS
SF 37 ±ac.
WETLAND PRESERVE 129 ±ac.
JAEGER RD
WETLAND PRESERVE 336 ±ac.
SECURITY PARK (NOT A PART)
MP 39 ±ac.
DOUGLAS ROAD

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FIGURE 6. Conceptual Vernal Pool Preserve

2002-009 RIO DEL ORO

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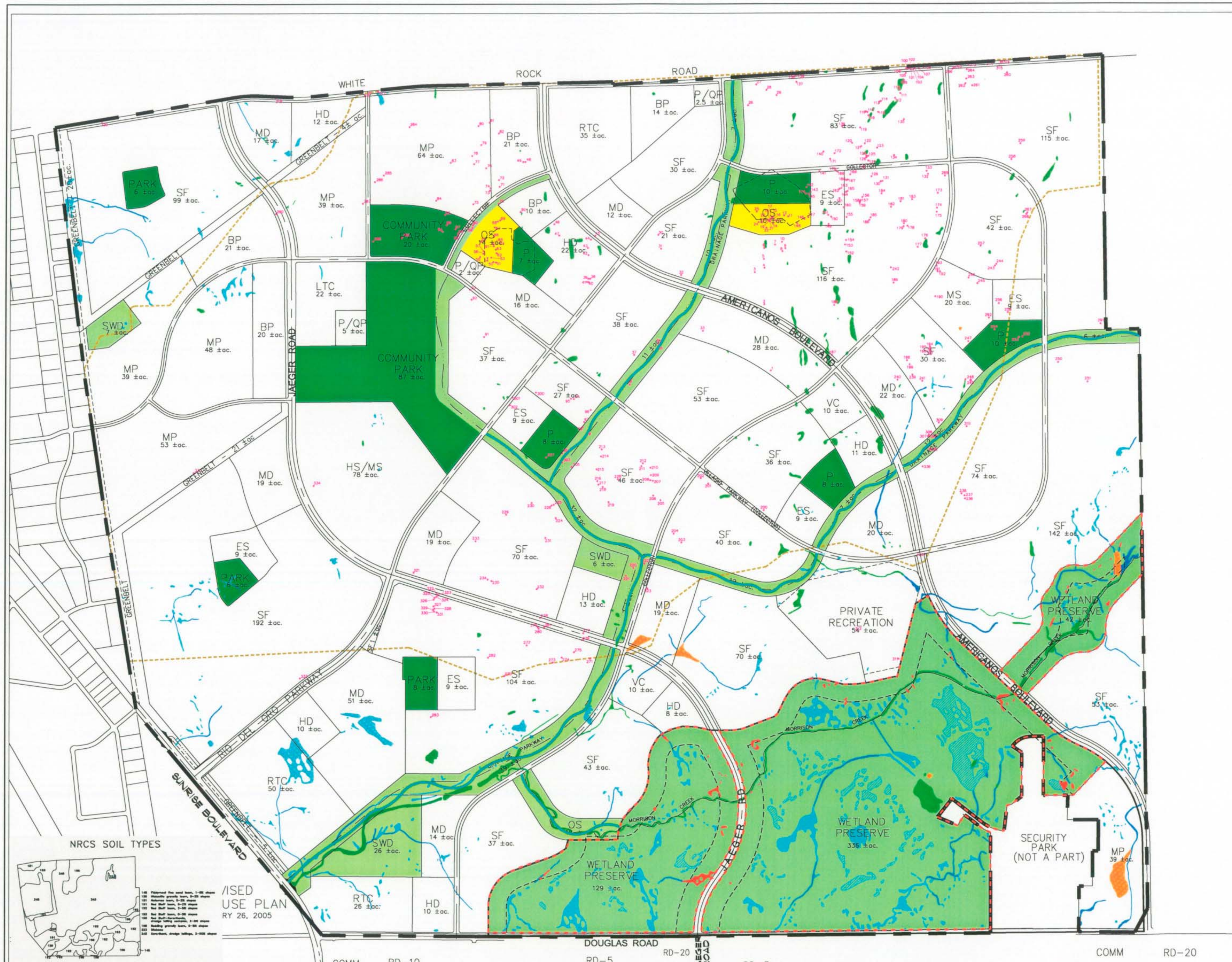

WETLAND TYPE	EXISTING ACREAGE	IMPACTS * JURISDICTIONAL	IMPACTS * ISOLATED	ON-SITE PRESERVE	ON-SITE CREATION
Wetlands:					
Vernal Pool	36.488	17.277	2.414	16.224	20.279
Pond	3.540	3.823	0.731	0.817	N/A 0.000
Seasonal Wetland Swale	6.044	3.309	0.853	2.448	N/A 0.000
Seasonal Wetland	8.418	3.084	0.158	3.384	N/A 19.300
Other Waters:					
Ephemeral Drainage	5.148	3.550		1.390	N/A 0.000
Seasonal/Riparian Wetland	—	—		—	13.302 *
Channel	—	—		—	8.534 *
TOTAL	59.638	30.338	13.946	26.248	58.973

INDIRECT

* In addition to Direct Impacts to 19.691 acres of vernal pool habitat, 2.179 acres of vernal pool habitat are within 250' of proposed development and considered indirectly impacted by project development.

* Seasonal wetland habitat will be established within 32 acres of on-site detention basins and riparian wetland.

* Seasonal wetland habitat, riparian and riparian wetland habitat will be established adjacent to the low-flow channels to be reestablished within the open space corridors.

Project Boundary
Line of Indirect Impact
Elderberry Location and ID#
Wetland Preserve (+/- 507 ac.)
Open Space (+/- 201 ac.)
VELB Preserve (+/- 24 ac.)
Park
Isolated Wetlands

NOTES

Gross project acreage: +/- 3828 acres

Base data provided by: G.C. WALLACE OF CALIFORNIA, INC.

This exhibit depicts information and data produced in strict accord with the U.S. Army Corps of Engineers wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and conforms to specifications per the Sacramento Corps District. However, wetland boundaries have not been legally surveyed and may be subject to minor adjustments if exact locations are required.

SCALE IN FEET

SCALE: 1"=500'

VICINITY MAP

RIO DEL ORO

PRESERVE/IMPACT MAP

DATE: 13 MAY 2005	REVISION: 9 SEPTEMBER 2005	PROJECT NO: 2002-009
DRAWN BY: CN/MC/ET	SCALE: 1"=500'	FILE NAME: RDO-PRES15.dwg
CHECKED BY:		LAYOUT: PRES
WETLAND VERIFICATION LETTER DATE:		

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

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Redlands Office: 412 East State St., Redlands, CA 92373, Ph: (909) 307-0046

JOB NAME: RIO DEL ORO - IMP
SCALE: 1"=500'
DATE: 13 MAY 2005
REVISION: 9 SEPTEMBER 2005
FILE NAME: RDO-PRES15.dwg

Valley Elderberry Longhorn Beetle Mitigation Plan

For

Rio Del Oro

Sacramento County, California

January 18, 2006

Prepared for:
Elliott Homes, Inc.
and
GenCorp Real Estate

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

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Valley Elderberry Longhorn Beetle Mitigation Plan

Rio Del Oro

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1.0 BACKGROUND INFORMATION

At the request of Elliott Homes, Inc. and GenCorp Real Estate, Gibson and Skordal conducted a Valley elderberry longhorn beetle (VELB) and elderberry shrub survey during the summer of 2000 within the Rio del Oro property (Project Area). The property is located north of Douglas Road, south of White Rock Road, and east of Sunrise Boulevard in Sacramento County, CA (Figure 1. *Project Site and Vicinity Map*). The ±3,892 acre site corresponds to portions of Sections 5, 6, 7, 8, 9, 10, 31, and 32, Townships 8 and 9 North, and Range 7 East, Mount Diablo Base Meridian (MDBM) of the "Carmichael, California" and "Buffalo Creek, California" 7.5-minute topographic quadrangles (U.S. Department of the Interior, Geological Survey, photorevised 1993).

Gibson and Skordal completed a series of elderberry surveys during July and August of 2000. The survey effort adhered to the current established conservation guidelines for the VELB (USFWS 1999). A total of 329 elderberry shrubs were identified in the Project Area, the majority of which are scattered throughout the dredge tailings on-site (Figure 2. *Elderberry Shrub Locations Map*). The elderberry shrubs observed within the Project Area range in size from small shrubs to large size trees. Forty-two (42) elderberry shrubs exhibit VELB evidence in the form of apparent exit holes, comprising approximately 13% of the total existing shrubs within the Project Area. Elderberry survey data are summarized in Attachment A.

The Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) became listed as a threatened species in 1980 (Federal Register 45: 52803-52807). As a result, impacts to potential VELB habitat require mitigation measures in general compliance with the requirements outlined in the U.S. Fish and Wildlife Service (USFWS) Conservation Guidelines for the Valley Elderberry Longhorn Beetle (USFWS 1999).

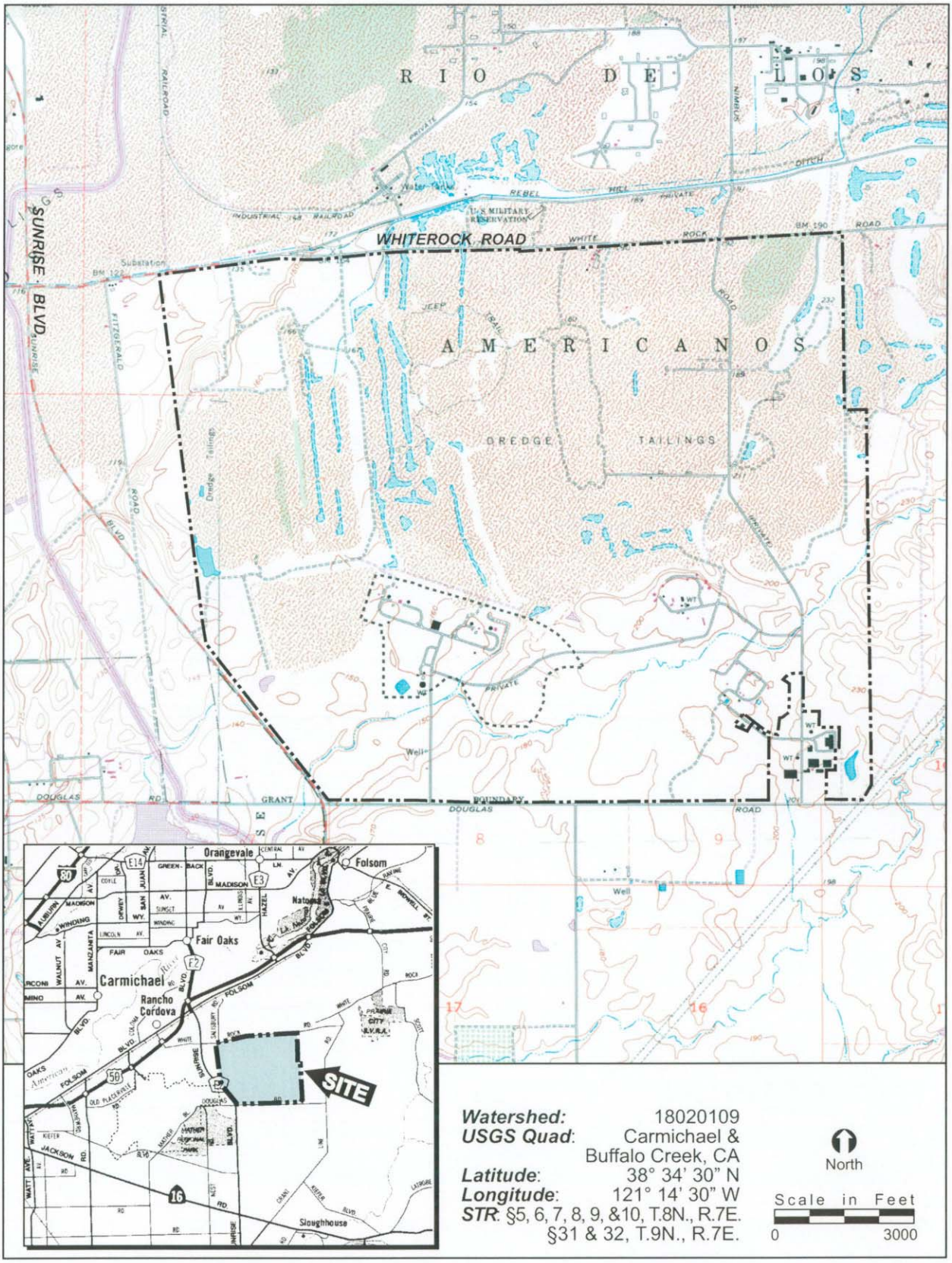

FIGURE 1. Project Site and Vicinity Map

2002-009 Rio del Oro

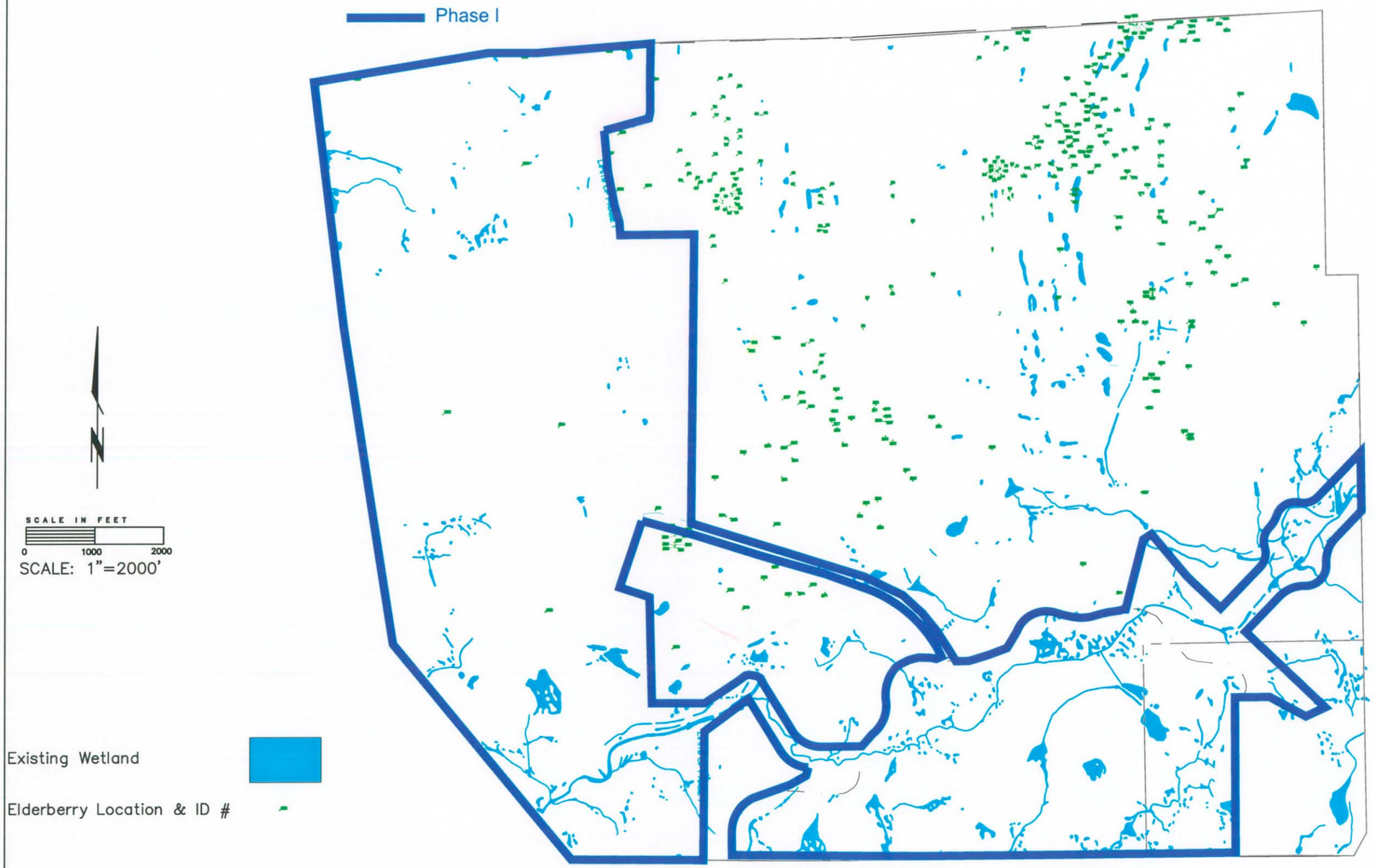

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FIGURE 9. Elderberry Locations

2002-009 Rio Del Oro

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1.1 Project Implementation

The proposed project will involve grading and filling activities to establish construction grade and installation of infrastructure for a master-planned community on the ±3,892 – acre parcel. The proposed land use plan includes high, medium, and low-density residential, retail/commercial, office, park, schools, wetland preserve, and open space areas.

The current land use plan will directly impact to 295 of the elderberry shrubs within the Project Area. On behalf of Elliott Homes Inc. and GenCorp Real Estate, ECORP Consulting, Inc. conducted an analysis of the required mitigation measures necessary to compensate for this total net loss. Mitigation calculations followed the compensation requirements outlined in the USFWS VELB Conservation Guidelines (USFWS 1999). These guidelines define mitigation measures based on the number of stems by diameter classes at ground level, the presence or absence of evidence/exit holes, and whether the elderberry shrubs occur in riparian habitats. Each of the 295 impacted shrubs are proposed for transplantation. An additional 3,019 elderberry seedlings and 3,891 associated natives will be planted and protected within conservation areas totaling 29-acres. Thirty-four (34) shrubs will remain in two on-site elderberry habitat preserves.

2.0 INTRODUCTION

This document provides information pertaining to the life history, habitat requirements, and threats posed to the elderberry habitat within the Project Area. This report summarizes VELB mitigation measures for the Project and describes how the proposed compensation measures comply with the USFWS Conservation Guidelines for the VELB (USFWS 1999). The ultimate goal of mitigation measures presented in this report is to avoid and minimize adverse effects on the VELB and the it's elderberry habitat. Mitigation will be accomplished through a combination of avoidance measures, compensatory mitigation (transplantation, additional plantings, and associated native plantings), and monitoring.

3.0 VELB LIFE HISTORY CYCLE AND OTHER ATTRIBUTES

3.1 Description and Taxonomy

The Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) is a member of the Cerambycidae family and is known from California alone. Subspecies separation is based on distribution and male color pattern variation (Barr 1991). The 'dimorphus' of its name alludes to morphological differences between males and females. Females are typically larger than males, and can grow up to two inches. They have shorter segmented antenna, and have dark metallic green forewings with red margins. The male's antenna is at least as long as its body and the prominent segmented antenna is what the common name 'longhorn' refers to. Males have red forewings and dark green spots.

3.2 Ecological Relationships

The VELB can only be found in association with its exclusive host plant the elderberry, typically blue elderberry (*Sambucus mexicana*) and occasionally red elderberry (*Sambucus racemosa*). VELB range is limited and includes all of California's Central Valley from Shasta County in the north to Kern County in the south at elevations below 3,000 feet (Barr 1991). Elderberry shrubs generally occur in riparian communities surrounding the American, San Joaquin, Tule, Kings, Kaweah, and Sacramento rivers and along outlying tributaries of these watersheds (USFWS 1999). They also occur in upland savannah areas adjacent to some riparian habitats.

Early work on the VELB has demonstrated that isolated elderberry shrubs and lone-standing drainages are less likely to support beetle populations than dense elderberry shrubs within riparian communities that have some connectivity to other habitats (Collinge et al. 2001).

3.3 Life Cycle

Adult beetles are present on elderberry shrubs from March through June. Adult males are short lived and survive for only a few days. Females persist for up to a month. They feed exclusively on the leaves and flowers of the host plant. During this time period mating occurs and females lay their eggs on the stems, leaves, and in bark crevices of elderberry shrubs. Hundreds of oblong, reddish brown eggs are laid which are about 2.5 to 3.0mm long and ridged. The eggs typically hatch within 24 to 48 hours and small larvae emerge. The larvae burrow themselves into the plant stems immediately. VELB larvae remain inside the elderberry stems for 1 to 2 years feeding on its pith. Their feeding activities create a distinctive gallery (feeding chamber) that is a hollow tunnel filled with frass and shredded wood (Barr 1991). Larvae mature and eventually pupate into adults. Adult beetles then chew an exit hole and emerge out of the shrub completing the life cycle. Although few researchers have seen adult beetles, their exit holes are often visible. Exit holes are circular or oval and are typically 5 to 15 mm. in diameter. Most exit holes are located in the basal portions of elderberry stems, generally not above heights of 4 feet.

3.4 Habitat Requirements

Elderberry shrubs are a common component of the Central Valley's lush riparian forests. This distinctive plant community surrounds the region's rivers, streams, and numerous watershed tributaries. The VELB appears to occur more frequently in thick riparian stands with high elderberry densities as opposed to sparse and highly fragmented riparian habitats.

3.5 Threats

Habitat loss and fragmentation are the most significant threats to the VELB. It is estimated that over 90% of the riparian habitat in California has been removed over the last century. Agricultural activities and conversion, suburban and urban development, aggregate mining sites, channelization, infrastructures such as damns and levees, and

flood control practices continue to replace the riparian forests throughout the state. In addition to habitat loss and fragmentation, exotic and invasive species pose a threat to the beetle. In particular the Argentine ant (*Linepithema humile*), an introduced species in riparian habitats, is a major threat to the distribution and survival of the VELB. Pesticide and herbicide use, insecticidal drift from fields and orchards, pollution and inappropriate chemical disposal, over grazing, and general mismanagement are several other factors contributing to the VELB demise.

4.0 MITIGATION MEASURES

The following VELB habitat mitigation plan has been prepared for the Rio del Oro site to mitigate known and potential direct and indirect impacts to elderberry shrubs within the proposed development areas of the project. A summary of proposed compensation (i.e., plantings or mitigation unit purchase) for direct and indirect impacts is included in Table 1.

Table 1. Proposed Elderberry Impacts And Mitigation

Location	Exit Holes	Number of Stems (by Diameter) at Ground Level			Elderberry Plantings	Associated Native
	Present	1" to 3"	> 3" & < 5"	≥ 5"	Required	Plantings Required
Non-Riparian	No	27	3	5	48	48
Riparian	No	572	117	151	2099	2099
Non-Riparian	Yes	1	0	2	14	28
Riparian	Yes	95	21	44	858	1716
				Subtotal:	3019	3891
Total Plantings: 6910						
Number of Transplants: 295						

4.1 Regulatory Context

Impacts to VELB habitat are subject to compliance with the federal Endangered Species Act (ESA). According to general compensation guidelines for impacts to VELB, as stipulated by the Guidelines (USFWS 1999), VELB habitat avoidance should be a priority. Complete avoidance can be assumed when a 100-foot buffer would be established and

maintained around all elderberry plants containing stems measuring one inch or greater in diameter at ground level. Encroachments into the 100-foot buffer require USFWS approval and may require mitigation for indirect impacts. If avoidance is not feasible, the Guidelines recommend transplantation of all existing elderberries that cannot be avoided by the project to a conservation area, and the establishment of new elderberry plants and associated native vegetation within the conservation area. This requires an incidental take permit issued by the USFWS. Replacement ratios for impacts (i.e., transplanted or destroyed) to elderberry stems one inch or greater in diameter at ground level, range from 1:1 to 8:1 (new plantings to affected stems). These ratios are based on stem size class, presence or absence of exit holes (evidence of VELB use), and location (riparian or non-riparian). For example, a replacement ratio of 1:1 is specified for elderberry shrubs located within non-riparian communities, with no evidence of VELB use and stems between one and three inches at ground level. A 4:1 replacement ratio is specified for shrubs where VELB evidence is apparent, stems are between one and three inches in diameter, and the shrub is riparian in habitat. An 8:1 replacement ratio is specified for elderberry shrubs where VELB evidence is apparent, stems are greater than five inches in diameter, and the shrub is located in a riparian community.

The Guidelines also describe recommended methods and timing for transplantation and planting activities, as well as habitat protection measures. The Guidelines indicate that recent studies have shown that VELB are more abundant in dense native plant communities, with mature overstory and mixed understory. Consequently, establishment of various native plants, at a given ratio to elderberries, is recommended. Compensation VELB habitat is typically monitored over a 10-year period.

The following mitigation measures have been prepared specifically for the Rio del Oro Project Area to address direct and indirect impacts to the 295 elderberry shrubs within the Project Area. These mitigation measures adhere to and satisfy the recommendations of the USFWS Conservation Guidelines for the Valley Elderberry Longhorn Beetle (USWFS 1999). Mitigation will be accomplished through a combination of avoidance, transplantation into designated preserves, compensatory mitigation (additional elderberry plantings and associated native plantings), and monitoring efforts.

4.2 Avoidance/Protection

Two designated elderberry habitat preserves totaling 24-acres have been established within the Project Area (Figure 3. *Land Use Plan*). Preserve #1 is located in the northwest corner of the site and has 16 existing elderberry shrubs that will be avoided and permanently protected. Preserve #2 is located in the middle of the site, to the east of Preserve #1, and supports 18 elderberry shrubs. These shrubs will also be avoided during the project activities and permanently protected. As recommended in the USFWS guidelines (USFWS 1999), these areas will be fenced off during construction and a 100-foot buffer zone will be established with brightly colored pin-flags. Contractors working in the vicinity of the preserves will be briefed on the need to avoid damaging the elderberry shrubs and forewarned regarding the consequences for not complying with these instructions. The members of the various work crews will also be informed about the status of the beetle and the need to protect its elderberry host. Signs indicating the necessary information, as outlined in the USFWS guidelines (USFWS 1999), will be erected every 50 feet along the edges of the avoidance/preservation areas.

Following construction activities, both of the elderberry preserves will be fenced and monitored as stipulated in the Mitigation Plan for Rio del Oro and the project's long-term Operations and Management Plan. During future monitoring efforts, particular attention will be given to ensure that the avoided elderberry bushes survive and thrive (i.e., maintenance of fencing and signs, weed control, trash removal, etc.). These preserve areas will be permanently fenced and will be protected by deed restrictions and conservation easements. The property will be managed as wildlife habitat in perpetuity. Such management will be funded by an endowment established by the applicant (Elliott Homes, Inc. and GenCorp Real Estate) and carried out by the City of Rancho Cordova or a third-party conservation entity.

4.3 Transplantation

As part of project mitigation plan implementation, the 295 elderberry shrubs that will be impacted by the project activities will be transplanted into the designated elderberry

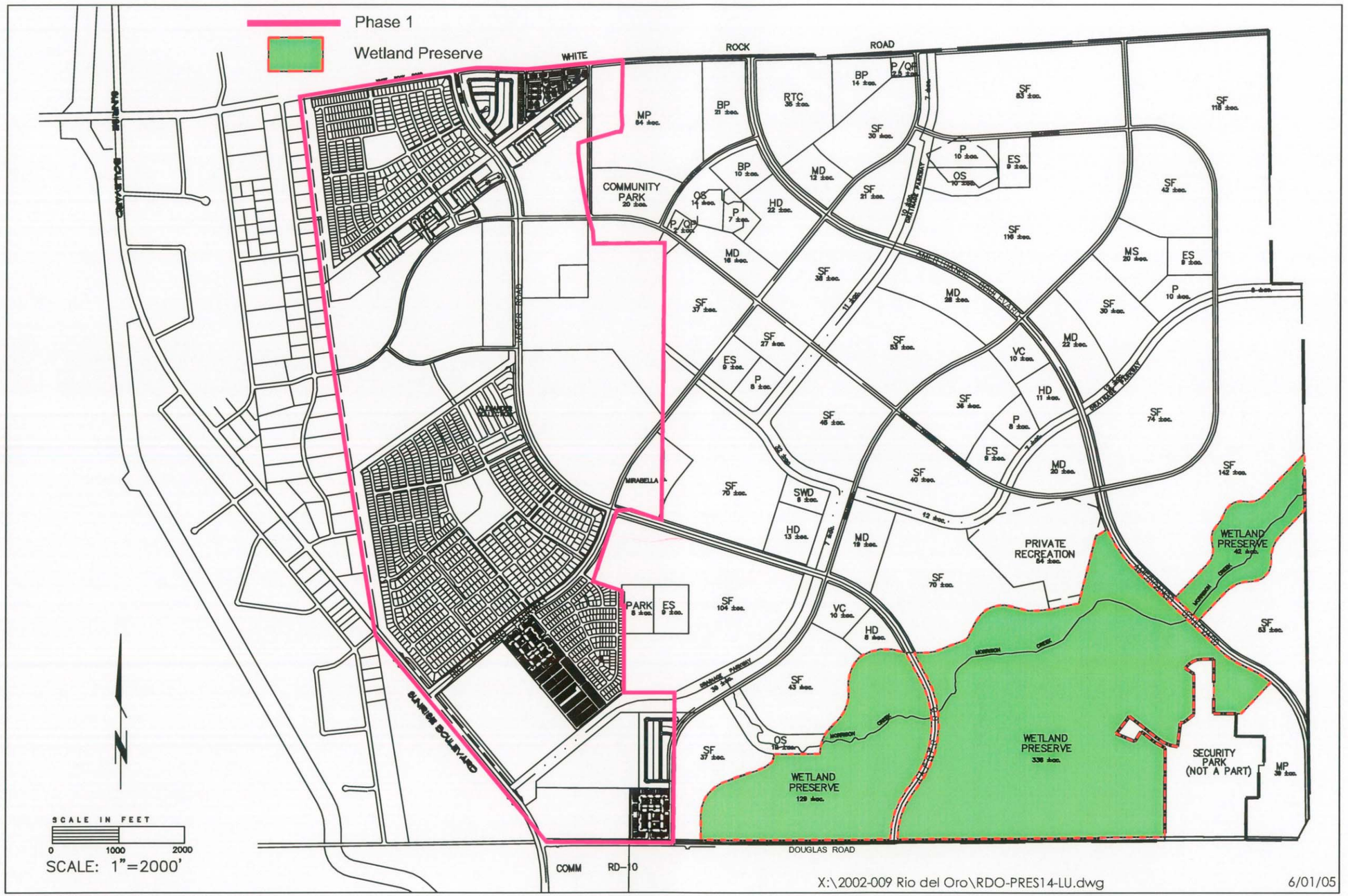

FIGURE 3. Land Use Plan

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ENVIRONMENTAL CONSULTANTS

preserve areas and along drainage corridors within the site. Transplantation activities will be conducted according to the recommendations supplied by the USFWS guidelines. Elderberry shrubs will be transplanted tot eh two conservations areas, on the Rio del Oro site. Additional acreage is available for elderberry mitigation purposes along several drainage corridors within the Project Area. Transplantation will occur at the appropriate time of year and a qualified biological monitor will observe all transplantation acts. The actual elderberry shrub transplanting will be conducted according to the "Transplanting Procedure" which is also outlined in the USFWS guidelines (USFWS 1999).

4.4 Additional Plantings

According to the USFWS guidelines, each elderberry stem with a diameter measuring 1.0 inch or greater that is adversely affected must be replaced. This includes all impacted elderberry shrubs, even if they are proposed transplants (USFWS 1999). According to ECORP Consulting, Inc.'s mitigation calculations, a total of 3,019 additional elderberry plantings are required to mitigate the impacts to existing shrubs that will ensue from the project activities (Table 1). The calculated additional plantings will be placed into the two designated elderberry habitat preserves and along the specified drainage corridors, among the avoided elderberry shrubs and transplanted shrubs.

4.5 Associated Native Plantings

According to USFWS, the VELB seems to prefer densely populated native plant communities, in which multiple elderberry shrubs are scattered throughout an established overstory layer and a diverse native understory layer. As such a total of 3,891 associated native plantings will be established in addition to elderberry plants. The types of species used will be determined by a restoration specialist. A list of common plants used in VELB restoration projects is included as Attachment B

4.6 Monitoring and Maintenance

Monitoring of the VELB mitigation preserve areas and corridors will occur over a ten year period, concurrent with monitoring of the greater Rio del Oro Vernal Pool Preserve.

One of the primary goals of this plan is to protect existing and transplanted elderberry shrubs from potential threats to their survival, as a means of safeguarding VELB habitat. Potential threats include excessive competition from invasive non-native vegetation, hydrological changes, herbicide/fertilizer residues, and human disturbances.

Invasive non-native annual plants can also impact VELB populations. Many invasive non-native annuals were introduced into the Sacramento Valley in the 1700's by Spanish missionaries (Barry, 1996). These invasive annuals have since flourished, competing with native grassland and riparian vegetation.

Changes in hydrology can also have a significant impact on VELB habitat. As modifications to the landscape can directly influence the hydrology of riparian and drainage areas, measures need to be implemented to ensure that the hydrology of VELB habitat preserves is not compromised.

In addition, human disturbances such as litter and motorized vehicle disturbance can negatively effect VELB populations. Trash and landscape clippings are often disposed of in preserves and can smother vegetation and introduce exotic non-native plant species into the preserve. Other human disturbance threats include motorized vehicles and foot traffic through designated VELB habitat preserve areas.

The VELB mitigation plantings will be monitored on a yearly basis during the appropriate period (mid-February through June) concurrent with other planned monitoring activities. Adaptive management decisions should be made based upon monitoring results. Elderberry shrubs and the associated native plantings within preserve areas will be surveyed to determine overall health and to assess approximate VELB population size.

4.6.1 Methods

Per USFWS guidelines, the population of valley elderberry longhorn beetles, the general condition of the conversation area, and the condition of the elderberry and associated native plantings in the conservation are will be monitored over a period of ten (10) consecutive years. If conservation planting is done in stages (i.e., not all planting is implemented in the same time period), each stage of conservation planting will have a different start date for the required monitoring time.

4.6.2 Surveys

Each year a minimum of two site visits between February 14 and June 30 will be made by a qualified biologist. Surveys will include:

1. A population census of the adult beetles, including the number of beetles observed, their condition, behavior, and their precise locations. Visual counts will be used; mark-recapture or other methods involving handling or harassment will not be used.
2. A census of beetle exit holes in elderberry stems, noting their precise locations and estimated ages.
3. An evaluation of plants and associated native plants within the preserve areas, including the number of plants, their size and condition.
4. An evaluation of the adequacy of the fencing, signs, and weed control efforts in the avoidance and conservation areas.
5. A general assessment of the habitat, including any real or potential threats to the beetle and its host plants, such as erosion, fire, excessive grazing, off-road vehicle use, vandalism, excessive weed growth, etc.

4.6.3 Reports

A written report, presenting a analyzing the data from the project monitoring will be prepared by a qualified biologist for ten (10) consecutive years. Copies of the report will be submitted by December 31 of the same year to the Service (Chief of Endangered Species, Sacramento fish and Wildlife Office), and the Department of Fish and Game (Supervisor, Environmental Services, Department of Fish and Gem, 1416 Ninth Street, Sacramento, California 95814; and Staff Zoologist, California Natural Diversity Data Base, Department of Fish and Game, 1220 S Street, Sacramento, California 95814). The report will explicitly address the status and progress of the transplanted and planted elderberry and associated native plants and trees, as well as any failings of the conservation plan an the steps taken to correct them. Any observations of beetles or fresh exit holes will be noted. Copies of original field notes, raw data, and photographs of the conservation area will be included with the report. A vicinity map of the site and maps showing where the individual adult beetles and exit holes were observed must be included. For the elderberry and associated native plants the survival rate, condition, and size of the plants will be analyzed. Real and likely future threats will be addressed along with suggested remedies and preventative measures (e.g. limiting public access, more frequent removal of invasive non-native vegetation, etc.).

A copy of each monitoring report, along with the original field notes, photographs, correspondence, and all other pertinent material, will be deposited at the California Academy of Sciences (Librarian, California Academy of Sciences, Golden Gate Park, San Francisco, California 94118) by December 31 of the year that monitoring is done and the report is prepared. The Service's Sacramento Fish and Wildlife Office will be provided with a copy of the receipt form the Academy library acknowledging receipt of the material, or the library catalog number assigned to it.

4.6.4 Access

Biologists and law enforcement personnel from the California Department of Fish and Game and the Service will be given complete access to the project site to monitor

transplanting activities. Personnel from both these agencies will be given complete access to the project and the conservation area to monitor the beetle and its habitat in perpetuity.

4.6.5 Success Criteria

A minimum survival rate of at least 60 percent of the elderberry plants and 60 percent of the associated native plants will be maintained throughout the monitoring period. Within one year of discovery that survival has dropped below 60 percent, the applicant must replace failed plantings to bring survival above this level. The Service will make any determination as to the applicant's replacement responsibilities arising from circumstances beyond its control, such as plants damaged or killed as a result of severe flooding or vandalism.

5.0 CONCLUSION

Gibson and Skordal conducted a VELB survey of the Rio del Oro Project Area during the summer of 2000. Surveys identified 329 elderberry shrubs within the Project Area. Approximately 13% of the identified elderberries had VELB evidence in the form of beetle exit holes. Development of the Rio del Oro project will result in direct impacts to 295 elderberry shrubs. Measures proposed to mitigate direct and indirect impacts to VELB habitat within the Project Area include avoidance of 34 remaining elderberry shrubs within two designated preserve areas (e.g. fencing and monitoring during construction activity) and the transplantation of impacted populations. In addition to the previously mentioned VELB mitigation measures an additional 3,019 elderberry seedlings and 3,891 associated natives will be planted and protected within conservation areas totaling 29-acres. All the VELB habitat preserves will be monitored over a ten year period concurrent with monitoring of the greater vernal pool preserve.

6.0 REFERENCES

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LIST OF ATTACHMENTS

ATTACHMENT A

Elderberry Shrub Survey Data Summary

SHRUBS WITH EVIDENCE

Elb. Ref. No.	1"-3"	3"-5"	>5"	Exit Holes	Riparian
11	1	1	3	Y	Y
14			1	Y	Y
15	4	1	1	Y	Y
26	3			Y	Y
32	1		2	Y	Y
46			1	Y	Y
51	1		1	Y	Y
68			2	Y	Y
70	1		1	Y	Y
72	1	3	1	Y	Y
73	1		1	Y	Y
79			1	Y	Y
86		1	1	Y	Y
91		1	1	Y	Y
96			2	Y	Y
100			2	Y	Y
124	3	2		Y	Y
142			1	Y	Y
153	2			Y	Y
166			1	Y	Y
167	1	1		Y	Y
179	4	3	1	Y	Y
199	6	1	1	Y	Y
200	6	2	1	Y	Y
201	7	1	1	Y	Y
203	9	1	3	Y	Y
213	1		4	Y	Y
214	4		1	Y	Y
231	6		1	Y	Y
239	12		2	Y	Y
242	1		1	Y	Y
243			1	Y	Y
246		1	2	Y	Y
248	1		2	Y	Y
249	7		1	Y	Y
258			2	Y	Y
260	12	3	2	Y	Y
268	4	1		Y	Y
273			1	Y	N
278			1	Y	Y
283	5		1	Y	Y
289			1	Y	Y

SHRUBS WITHOUT EVIDENCE

Elb. Ref. No.	1"-3"	3"-5"	>5"	Exit Holes	Riparian
1	1	2	1	N	Y
2	1	2	1	N	Y
3			1	N	Y
4			1	N	Y
5		2		N	Y

SHRUBS WITHOUT EVIDENCE

Elb. Ref. No.	1"-3"	3"-5"	>5"	Exit Holes	Riparian
6			1	N	Y
7			1	N	Y
8	2			N	Y
9			1	N	Y
10	2			N	Y
12			2	N	Y
13			1	N	Y
16			2	N	Y
17	1	1	1	N	Y
18	4		1	N	Y
19		1	1	N	Y
20			2	N	Y
21		1		N	Y
22		1		N	Y
23		2		N	Y
24	2	1	1	N	Y
25	16	5	1	N	Y
27	1		1	N	Y
28	4		1	N	Y
29	7	2	6	N	Y
30	5	1		N	Y
31			1	N	Y
33	3			N	Y
34	2		1	N	Y
35	3		1	N	Y
36	5		2	N	Y
37	2		1	N	Y
38	1		1	N	Y
39	1	5	1	N	Y
40				N	Y
41	6	1		N	Y
42	3		1	N	Y
43			1	N	Y
44	3		1	N	Y
45	6	2	2	N	Y
47	1			N	Y
48	1		1	N	Y
49	2		1	N	Y
50	2	1		N	Y
52			1	N	Y
53	2		1	N	Y
54	7	2	2	N	Y
55			1	N	Y
56			1	N	Y
57	1		1	N	Y
58			1	N	Y
59	2	1	2	N	Y
60	2	1		N	Y
61	1			N	Y
62	1			N	Y
63	4			N	Y
64	3			N	Y

SHRUBS WITHOUT EVIDENCE

Elb. Ref. No.	1"-3"	3"-5"	>5"	Exit Holes	Riparian
65	4			N	Y
66	3			N	Y
67			2	N	Y
69	2		1	N	Y
71		2		N	Y
74	4		1	N	Y
75			1	N	Y
76		1	1	N	Y
77			1	N	Y
78			1	N	Y
80			1	N	Y
81			1	N	Y
82		1	1	N	Y
83		3	2	N	Y
84	2		1	N	Y
85		1		N	Y
87	1	1		N	Y
88			1	N	Y
89	3	1	1	N	Y
90	4	1	1	N	Y
92	23		1	N	Y
93		1		N	Y
94	4		1	N	Y
95	1		1	N	Y
97	4		1	N	Y
98	2		1	N	Y
99	2	1		N	Y
101	7			N	Y
102	3			N	Y
103	2		1	N	Y
104	7			N	Y
105	2			N	Y
106	2			N	Y
107	5			N	Y
108	4			N	Y
109	4			N	Y
110	2			N	Y
111	2		1	N	Y
112	7			N	Y
113	2	2	1	N	Y
114	1	1		N	Y
115	3		2	N	Y
116	2		1	N	Y
117	2	1		N	Y
118	7	1	2	N	Y
119	3	5		N	Y
120	2	1		N	Y
121	1		3	N	Y
122	4		4	N	Y
123	10			N	Y
125	1	2	1	N	Y
126			1	N	Y

SHRUBS WITHOUT EVIDENCE

Elb. Ref. No.	1"-3"	3"-5"	>5"	Exit Holes	Riparian
127	1			N	Y
128	1	1		N	Y
129			1	N	Y
130	3	2	1	N	Y
131	2	1		N	Y
132	1			N	Y
133	6			N	Y
134	1			N	Y
135			1	N	Y
136	2	1		N	Y
137	1		2	N	Y
138	1		3	N	Y
139	1		1	N	Y
140	5		2	N	Y
141		1	1	N	Y
143			1	N	Y
144	3			N	Y
145		1		N	Y
146		1	1	N	Y
147	4	2	3	N	Y
148	1			N	Y
149	4			N	Y
150	1			N	Y
151	1		1	N	Y
152	3	1		N	Y
154	5	1		N	Y
155	1			N	Y
156	1			N	Y
157	1	1		N	Y
158	4	1		N	Y
159	5		3	N	Y
160	2			N	Y
161	3		1	N	Y
162		1		N	Y
163			1	N	Y
164	1			N	Y
165	2		1	N	Y
168	4	1		N	Y
169	2		1	N	Y
170		2	2	N	Y
171	1	1		N	Y
172	4	1		N	Y
173	2	3	2	N	Y
174	1			N	Y
175				N	Y
176	2			N	Y
177	1			N	Y
178		1	3	N	Y
180			1	N	Y
181	1			N	Y
182	1		1	N	Y
183	2			N	Y

SHRUBS WITHOUT EVIDENCE

Elb. Ref. No.	1"-3"	3"-5"	>5"	Exit Holes	Riparian
184	2			N	Y
185	3			N	Y
186			1	N	Y
187			1	N	Y
188	3			N	Y
189	2	1		N	Y
190	1			N	Y
191	7	2		N	Y
192	3			N	Y
193	3			N	Y
194	2		1	N	Y
195	8	1		N	Y
196	5			N	Y
197	1	1		N	Y
198	2	3	2	N	Y
202	3		1	N	Y
204	1			N	Y
205	2	1		N	Y
206	1		1	N	Y
207			1	N	Y
208	4	1		N	Y
209	8		1	N	Y
210	11			N	Y
211	1	2	1	N	Y
212	1			N	Y
215	6	1	1	N	Y
216		1	1	N	Y
217	6	1	1	N	Y
218	3			N	Y
219	2	1		N	Y
220	1			N	Y
221		3	1	N	Y
222	1	1		N	Y
223	7	1		N	Y
224	4			N	Y
225	3	1		N	Y
226	4	1		N	Y
227	4	3		N	Y
228	4	1		N	Y
229			3	N	Y
230	3			N	Y
232			1	N	Y
233	3		1	N	Y
234	3		1	N	Y
235	8	2		N	Y
236	1			N	Y
237	1			N	Y
238	1			N	Y
240	5		1	N	Y
241				N	Y
244		1		N	Y
245			2	N	Y

SHRUBS WITHOUT EVIDENCE

Elb. Ref. No.	1"-3"	3"-5"	>5"	Exit Holes	Riparian
247	2			N	Y
250	2		2	N	Y
251			1	N	Y
252	1	2		N	Y
253			1	N	Y
254	4		1	N	Y
255	1			N	Y
256	2			N	Y
257				N	Y
259	1			N	Y
261	5			N	Y
262	3			N	Y
263	3	1		N	Y
264	1			N	Y
265	3			N	Y
266	1			N	Y
267	3	1		N	Y
269			1	N	Y
270	2			N	Y
271	4			N	Y
272	6			N	Y
274	10	1		N	N
275	1			N	Y
276	7	1		N	Y
277	4			N	Y
279	3		1	N	Y
280	3			N	Y
281	5			N	Y
282	3			N	Y
284	1		1	N	Y
285			1	N	Y
286	1	1		N	Y
287	3			N	Y
288	1	2		N	Y
290	4	1	1	N	Y
291	5	1		N	Y
292	1			N	Y
300			1	N	Y
301			1	N	Y
302			1	N	Y
303	8		2	N	Y
304	3	1		N	Y
305	11			N	Y
306			1	N	Y
307			2	N	Y
308			1	N	Y
309	1	1	1	N	Y
310	1		1	N	Y
311		2	1	N	N
312			1	N	Y
313	6			N	Y
314	5			N	Y

SHRUBS WITHOUT EVIDENCE

Elb. Ref. No.	1"-3"	3"-5"	>5"	Exit Holes	Riparian
315		1		N	Y
316	2	1		N	Y
317	3		1	N	N
318	4		1	N	N
319	6			N	N
320	4			N	N
321	3		1	N	Y
322		1	1	N	Y
323	1		1	N	Y
324	3	1		N	Y
325	2			N	Y
326		1		N	Y
327			1	N	Y
328			1	N	Y
329			1	N	Y
330			1	N	Y
331			1	N	Y
332			1	N	Y
333	1	1		N	Y
334	1			N	Y
335	1	1		N	Y
336			1	N	Y
337	3	1		N	Y
TOTAL	**755**	**160**	**236**		

ATTACHMENT B

Native Plants Used in VELB Restoration

Native Plants for Use in Restoration

Scientific Name	Common Name
Trees	
Acer negundo	Box elder
Aesculus californica	California buckeye
Alnus rhombifolia	White alder
Fraxinus latifolia	Oregon ash
Juglans californica	California black walnut
Platanus racemosa	Western sycamore
Populus fremontii	Fremont cottonwood
Quercus douglasii	Blue oak
Quercus lobata	Valley oak
Quercus wislizeni	Interior live oak
Salix exigua	Narrowleaf willow
Salix gooddingii	Gooding's black willow
Salix laevigata	Red willow
Salix lasiolepis	Arroyo willow
Shrubs	
Baccharis pilularis	Coyote brush
Ceanothus cuneatus	Wedgeleaf ceanothus
Cephalanthus occidentalis	Button-willow
Cercis occidentalis	Western redbud
Fremontodendron californicum	Flannelbush
Heteromeles arbutifolia	Toyon
Mimulus aurantiacus	Bush monkeyflower
Rhamnus ilicifolia	Hollyleaf redberry
Rhamnus tomentella	Hoary coffeeberry
Rubus ursinus	California blackberry
Rosa californica	California rose
Salix exigua	Narrow-leaved willow
Salix lasiolepis	Arroyo willow
Vitis californica	California wild grape
Grasses	
Bromus carinatus	California brome
Elymus elymoides	Squirreltail
Elymus glaucus	Blue wildrye
Frestuca idahoiensis	Idaho fescue
Hordeum branchyantherum	Meadow barley
Leymus triticoides	Creeping wildrye
Melica californica	Oniongrass
Muhlenbergia rigens	Deer grass
Nassella pulchra	Purple needle grass
Poa secunda	One-sided bluegrass