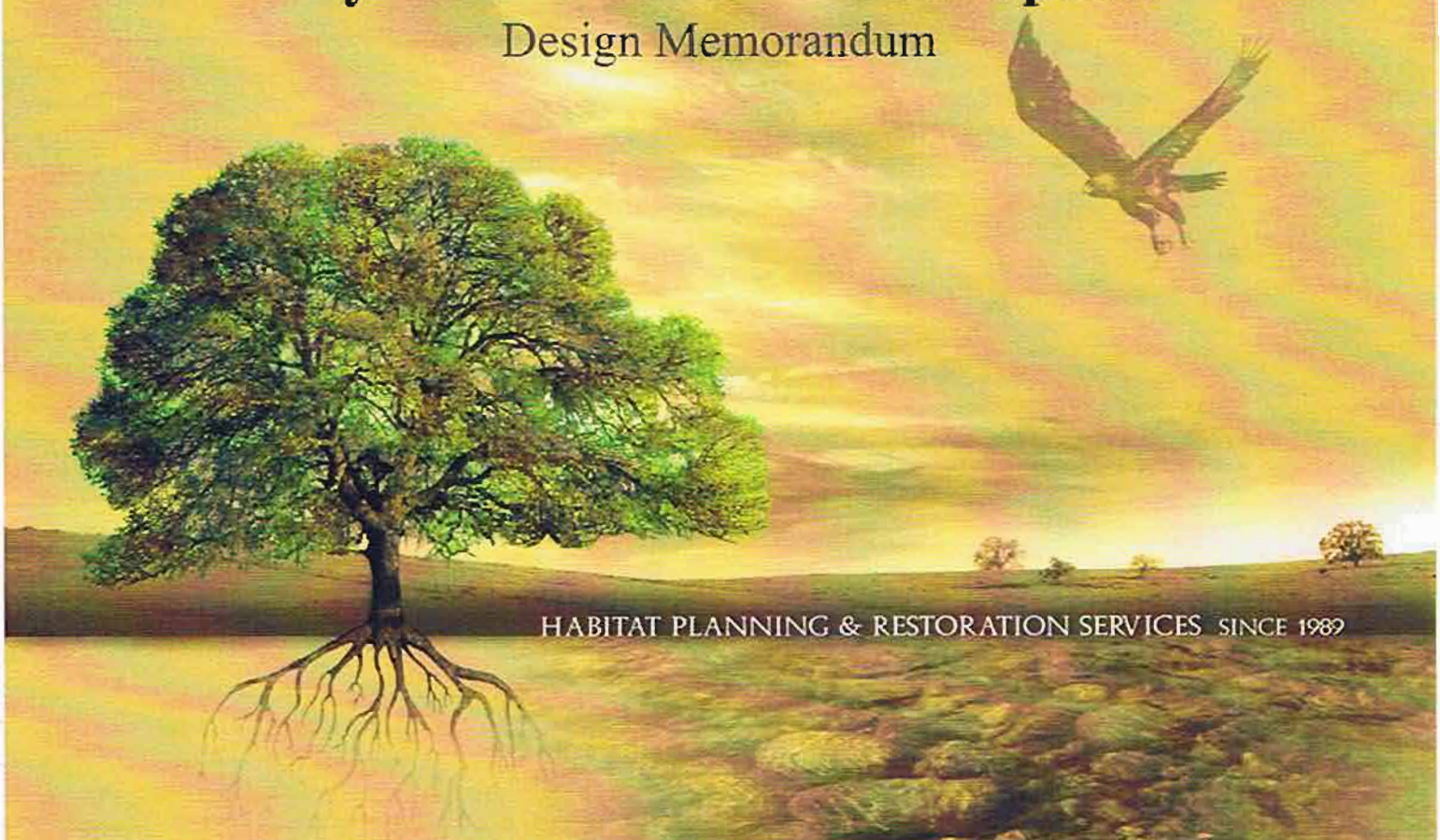
Appendix K - Project and Condition Assessments

RESTORATION
RESOURCES

Dry Creek Watershed Plan Update

Design Memorandum



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RESTORATION RESOURCES
3888 Cincinnati Avenue, Rocklin, CA 95765

Placer County
August 9, 2010

RESTORATION
RESOURCES

August 9, 2010

Mr. Thomas Plummer, P.E.
Civil Engineering Solutions, Inc.
1325 Howe Avenue, Suite 202
Sacramento, CA 95825

RE: Dry Creek Watershed Plan Update

Dear Tom:

Restoration Resources entered a contract with Civil Solutions on June 6, 2010 to provide our professional opinion with regard to potential biological and regulatory constraints to construction of proposed flood water management structures at five different locations within the Dry Creek Watershed in Roseville and Granite Bay California. Restoration Resources staff visited each of the five sites and attempted to discern likely regulatory problems associated with each proposed structure. We also viewed each site with an eye towards habitat mitigation opportunities that could be incorporated in final storm water management planning efforts. We feel that providing mitigation plans along with proposed construction plans will greatly facilitate ultimate project approval and permit acquisition from state and federal regulatory agencies.

In the following pages our "Design Memorandum" presents our best professional opinion of the biological constraints and opportunities for each of the five sites. We believe that two of the sites, Site A – Antelope Creek Upstream of Atlantic Street and Site B – Secret Ravine Upstream of Sierra College Boulevard, are well suited to the proposed flood flow constriction structures and that each could potentially provide opportunities to mitigate unavoidable impacts to protected natural resources lost due to construction of flood management facilities within the Dry Creek Watershed. The other three sites under consideration, Site C – Linda Creek Upstream of Auburn-Folsom Road, Site D – Linda Creek Upstream of Wedgewood Drive, and Site E – Linda Creek Upstream of Old Auburn Road have constraints that, in our opinion, render each of them unusable for the proposed purpose.

We welcome your review of and comment on our Design Memorandum and look forward to providing additional input at some point in the future should you proceed with proposed project design.

Sincerely,

Riley Swift
President

3868 Cincinnati Avenue Rocklin, CA 95765
Phone 916-408-2990 / Fax 916-408-2999 / Lic. #429252 / www.restoration-resources.net

Dry Creek Watershed Plan Update
Design Memorandum

Placer County,
California

August 9, 2010

Prepared for:

Civil Engineering Solutions, Inc.
1325 Howe Avenue, Suite 202
Sacramento, California 95825
Contact: Mr. Thomas Plummer, P.E.

Prepared by:

Restoration Resources
3888 Cincinnati Avenue
Rocklin, CA 95765
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Riley Swift

RESTORATION
RESOURCES

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APPENDICES

August 9, 2010

DRAFT
DESIGN MEMORANDUM

Project Name and Number: 29001 Dry Creek Watershed Project
Client Name: Civil Engineering Solutions, Inc.
Contact Person: Thomas Plummer, Jr., P.E.
Email Address: Thomasplummer@civilsolutions.org
Phone Number: (916) 563-7300 **Fax:** (916) 563-7362

Introduction

Restoration Resources completed ground surveys for the five sites in Roseville and Granite Bay, Placer County, California included under the above named contract with its client, Civil Engineering Solutions, Inc (Client). The location of each of the sites can be found on the map in Appendix F at the end of this report. The sites were surveyed in June and July 2010 to determine if there were obvious biological or other resources that might constrain the construction of proposed storm water management structures. While no formal wetland delineations were attempted, the surveyors are well versed in the protocols and clearly understand the parameters that define jurisdictional habitat for the purposes of Department of the Army, Corp of Engineers (ACOE) Clean Water Act (CWA), section 404 wetland fill permits, as well as those used by the California Department of Fish and Game (CDFG) to define their area of jurisdiction for Fish and Game Code section 1600 Streambed Alteration Agreements.

Virtually all work proposed for the Dry Creek Watershed Project will take place in areas that fall under the jurisdiction of CDFG and each proposed structure will necessitate a CWA section 404 permit from ACOE. Completion of the CWA section 404 permits will require Biological Opinions from the National Marine Fisheries Service and the U.S. Fish and Wildlife Service because of potential impacts to listed species of anadromous fish and one insect. Additionally, the final permit will require a review and approval of the project by the state Water Resources Control Board under CWA section 401 and clearance by the State Historic Preservation Office (SHPO) under CWA section 106 related to archeological and historic resources. Therefore, the five sites were surveyed specifically for potential negative effects to critical habitat for state and federally listed species which are protected under the federal Endangered Species Act and state endangered species regulations from proposed construction activities which can in turn negatively influence the permitting process. Restoration Resources prepared maps showing listed plant and animal species recorded within five miles of each site as archived in the CDFG Natural Diversity Data Base (CNDDB) prior to field visits to better inform surveyors of potential occurrences of species of special concern and enable them to look for specific biological resources.

In the future, the proposed work will be further reviewed by local permitting entities where it will need to meet the requirements under the California Environmental Quality Act (CEQA) and, if federal money is provided for construction, the National Environmental Protection Act (NEPA). Under CEQA, certain restrictions to the construction period will be applied to protect nesting raptors and very likely, all migratory birds; therefore, surveys should be conducted for raptors and other birds. Because each of the sites proposed work will be done in relatively mature riparian woodland habitats it can be assumed that no heavy equipment work will be allowed during February through July 15th in order to protect nesting birds from disturbance. Also, it should be expected that conditions imposed upon the project by CDFG in its section 1600 Streambed Alteration Agreement will further restrict the construction season by stating that no work shall be done after October 15th, though in some years it may be possible to extend this date by a month. Furthermore, under CEQA and local permits, as well as the CWA section 401 review, erosion and water quality issues, especially turbidity in receiving streams, will be of primary concern and will require a Storm Water Pollution Prevention Plan (SWPPP) containing a myriad of appropriate Best Management Practices (BMPs) to be carried out and maintained by the contractor during the course of construction.

The following accounts of data gathered during site surveys are generally limited to findings that will likely impinge upon the proposed work. The more generally applicable constraints to the project including the need for formal wetland delineations and protocol level surveys for listed species prior to permit applications are left unsaid. While surveyors examined all exposed soils at cut banks and elsewhere within the sites the NRCS soils maps and descriptions were considered adequate to assess site suitability for proposed structures and for Restoration Resources' conceptual proposals for habitat mitigation (enhancement, restoration, and creation) opportunities which, if developed appropriately, could be used to offset project impacts to important resources and garner agency and public support for the project. Appendices including various maps of each site prepared by Restoration Resources are found at the end of this report.

Site A – Antelope Creek Upstream of Atlantic Street

Site A encompasses the Antelope Creek floodway paralleling I-80 on its west side and extending upstream approximately 1.3 miles from roughly from the Galleria/N. Harding Blvd. creek overcrossing, under the Roseville Parkway overcrossing and nearly reaching the SR-65 overcrossing. The proposed project envisions two storm water detention weir structures located (#1) upstream of the railroad overcrossing and Galleria/N. Harding Blvd. and (2) upstream of the landfill service road overcrossing below Roseville Parkway. During our site visit we first confirmed the proposed weir locations and then determined likely impediments to weir construction and biological impacts resulting from construction and periodic flooding upstream of each weir. Our findings are presented below for each of the proposed structures separately.

Weir #1

Site Constraints: The proposed location for Weir #1 is constrained by an existing underground gas line and a sewer line. We believe that the location of the weir should be moved upstream of the gas line and sewer line access manhole and downstream of the existing storm drain outfall bringing runoff from the base of the railroad grade and adjacent capped landfill site to Antelope Creek. The weir should tie into the existing berm covering the sewer line and be constructed in a manner to allow room on the downstream side of the proposed weir for access to the sewer line where it crosses under the creek or railroad grade for future maintenance needs. The weir should also be constructed so that the spillway elevation is below the sewer line elevation to avoid flooding into the manhole. On the downstream side of the proposed weir we recommend that the earthen fill covering the existing gas line be provided with rock armor over geotextile fabric to provide erosion protection from peak flows, especially those that overtop the proposed weir. The existing maintenance road for the sewer line and landfill site could provide excellent all weather vehicular access to the weir for construction and on-going maintenance operations.

Impacts to existing vegetation from Weir #1 construction at the adjusted location will likely be limited to an approximately 14" diameter at breast height (dbh) Oregon ash and a 12" dbh valley oak with some impacts to minor woody and herbaceous riparian habitat. Fill of protected waters of the U.S. will occur during construction and some impact to waters will likely result from proposed rock armor installation at the weir outfall(s). Impacts to waters of the U.S. and wetlands will require a permit which in turn will require suitable mitigation. Upstream flooding effects to existing protected habitat will be limited to the relatively mature but narrow band of riparian habitat. This zone include numerous oaks, most of which are valley oak, and we do not think that decline in health and vigor or death of these trees will be significant, however, we believe that some oak tree or woodland mitigation is advisable from the outset. A very few elderberries exist on higher ground upstream of the Weir #1 location, but are not likely to be a significant issue.

Since this reach of Antelope Creek is accompanied by several capped landfill areas any proposed construction work and enhanced flood-up zones need to be reviewed in detail with the landfill managers. Numerous ground water monitoring wells exist in the existing and proposed floodplain areas and the potential effects of flooding these facilities are unknown to us. Management activities of landfill managers including vegetation management would necessarily be addressed in any mitigation planning efforts for the site.

Habitat Restoration Opportunities: As can be seen in our Opportunities and Constraints map in Appendix A, we propose an "Oxbow Channel" be constructed in the open area east of Antelope creek just upstream of Weir #1 and identified by RBF Consultants as being within the area of inundation during storm water detention periods. This portion of the existing Antelope Creek floodplain does not currently support wetlands nor oak or riparian habitat likely a result of capping the adjacent landfill site. The created "Oxbow"

should be designed and constructed to allow for multiple overbank flooding and backwatering events during every winter season, but should not allow for juvenile anadromous fish to become stranded during out-migrations. The "Oxbow" concept could allow for creation of fish rearing habitat, as well as seasonal wetland, freshwater emergent marsh edge, willow riparian, oak riparian, and oak woodland for potential mitigation requirements from weir construction in numerous locations in the Dry Creek Watershed. The resultant wetland-related habitats will provide value to many additional wildlife species including western pond turtle and numerous passerine birds.

The excess material generated by the excavation of the "Oxbow" could be used to create mounds or upland habitat islands within the floodplain, as well as providing additional fill for existing creek-bank levees. Upland components within riparian zones and floodplains provide hydrologic and soil conditions suitable for establishment of valley oak and elderberry plantings. If excess fill were generated that needed to be removed from the floodplain for capacity reasons then perhaps it could be used as additional cover for the adjacent petroleum and sewer lines, the landfill cap, and potentially as backfill against the downstream side of the proposed Weir #1.

Moving upstream from the "Oxbow" floodplain lays another, smaller relatively open area on the east side of Antelope Creek that currently supports shrubs and non-native herbaceous cover. This upper terrace floodplain area would be a good candidate for additional oak woodland tree plantings and herbaceous cover enhancement plantings for potential oak tree and oak woodland habitat mitigation. No grading is necessary for this site to be usable for such mitigation; however, some pre- and post-planting weed control efforts are warranted.

Still further upstream and across the creek on the west side there is an area on the lower floodplain terrace that appears to have been used for oak tree mitigation. The relatively recently installed oaks, primarily valley and interior live with occasional blue oaks, are planted in rows and spaced roughly 10-feet on-center. There are areas to the north and south of this plantation that are open and could be used for additional planting, but we suggest in a more ecologically appropriate manner to provide a more diverse and appropriate habitat condition for the area. The existing "oak orchard" seems to have been created to provide the most "bang-for-the-buck" on the smallest patch of dirt possible and it is our belief that as these container oaks mature the more dominate ones will out-compete others and shade out their competitors.

A small cluster of elderberry shrubs was also found in this area between the creek and the "oak orchard". These shrubs may be at risk of mortality if they are flooded with any frequency or for any duration as a result of the construction of Weir #1. The elevation of the root crowns of these plants should be determined and the potential flood regime established during final resource assessments if the project is to proceed. Transplantation of these shrubs may be possible, but we recommend against it in order to protect the existing stream bank and propose instead planting additional elderberry shrubs on the upland islands created as a part of the "Oxbow" downstream.

If resource agencies require additional fish habitat enhancements as mitigation for project impacts beyond that available from our proposed "Oxbow" creation, we suggest that some work could be done from existing high banks to remove existing concrete rip rap exposed along mostly the left bank of Antelope Creek. And some additional work could be done with the same excavator after concrete slab and rubble removal to create small benches on which native riparian plantings could easily be installed. One of the many potential benefits to the stream environment will be to reduce warming of waters due to the increase of shading provided by streamside plantings of woody species on these steeper banks.

As a general habitat enhancement operation that would carry weight in discussions of mitigation options with regulatory agencies, an invasive exotic weed removal program is recommended. This reach of the creek currently supports some small populations of the particularly pernicious aquatic and riparian weeds. We identified red sesbania, black locust, and perennial pepperweed in riparian zones and parrot's feather in slow-water sections of the creek channel. Each of these species should be controlled or eradicated, if possible. The more ubiquitous Himalayan blackberry extends throughout the riparian zone and in some cases up into adjacent oak woodland habitat. Management of this species is recommended even though eradication is not feasible. Weed control can be done with chemicals in some instances and by manual or mechanical methods in others. Himalayan blackberry can be managed with goat grazing, mechanical means, and correctly timed spraying with appropriately labeled herbicides.

Weir #2

Site Constraints: The proposed location for Weir #2 across Antelope Creek appears to be upstream of the existing service road overcrossing and approximately at or near the location of an existing stream monitoring gage. This location is problematic for two primary reasons. First, construction of the weir at the proposed location would have significant impacts to well developed stream-zone waters of the U.S. and wetlands along with valuable riparian habitat components up and downstream of the weir which developed as a result of beavers damming the stream at the service road overcrossing. And second, much of the work would necessarily be in the water and mucky sediment accumulated on the bottom of the beaver pond and a small willow-covered island would have to be removed, raising the cost of the venture.

Another potential constraint to construction of Weir #2 is the prescribed overflow elevation. Just upstream of the beaver pond and between the pond edge and the post and cable fence separating the creek habitat area from the bike trail is a sewer manhole and other infrastructure facilities placed underground. Based upon our assumption of the proposed weir location it appears that the new weir could not raise water levels much without flooding the manhole and, in some spots even the bike trail making this structure likely not worth the cost in terms of volume detained per dollar.

Opportunities: We believe that Weir #2 should be created by simply removing the beaver dam at the service road/bike trail overcrossing and lowering the existing static

water level to create additional storage volume upstream of the existing barrier. Obviously, removal of the beaver dam is a temporary fix and therefore it would have to be followed by a well designed beaver proof inlet to existing culverts passing stream flows under the service road/bike trail overcrossing. Furthermore, beavers in this reach must be controlled through trapping by experts under a CDFG depredation permit. The City of Roseville currently works with trappers from the Placer County Agricultural Department to remove beavers from the Dry Creek Watershed and this site could be made one of critical importance to all concerned in order to ensure the storm water detention value of the existing structure. We feel that this alternative to a new weir structure could provide significant detention at minimal cost.

Site B - Secret Ravine Upstream of Sierra College Boulevard

Prior to our visit to Site B, draft base maps including aerial photos, property boundaries, potential jurisdictional wetland features, elderberry shrub locations, and a conceptual design of the proposed flood wall along with draft flood impact zones within the site were provided by the Client, Placer County Flood Control Agency, and RBF Consulting. These maps along with soils maps and CNDDB maps prepared by Restoration Resources were taken into the field to verify data represented and to use for recording observations made by Restoration Resources staff.

Data and maps provided to date indicate that a 300' long flood water detention wall spanning the Secret Ravine creek and its immediate floodplain will be constructed parallel to Sierra College Blvd. roughly 30 to 50 feet from the toe of the slope extending down from the elevated Sierra College Boulevard overcrossing. The conceptual plan indicates that the flood wall will have an opening presumably wide enough to pass the entire low flow volume of the creek and that the opening will span the existing creek channel. Flows in excess of the capacity of this opening will be detained upstream of the wall within the existing upper terrace floodplain. Our site inspection and preliminary vegetation analysis indicates that typical creek incision processes have left much of this upper floodplain terrace abandoned even during higher runoff events. The proposed project should re-attach the creek to much of the upper terrace floodplain area during peak flow periods while reducing downstream affects of flood waters on developed areas within the lower Dry Creek Watershed.

Restoration Resources mission was to evaluate the potential effects of flood wall construction to protected natural resources and to present some conceptual habitat enhancement and mitigation opportunities that may be found within the boundaries of the site. The following discussion is meant to present our preliminary findings in meeting our goals and completing our mission.

Existing Conditions – Westerly Portion

Restoration Resources prepared a map combining the various graphic information data sets provided that depicts the site's boundaries, topography, resource findings and its

habitat attributes (see Appendix B). As presented, the overall site encompasses approximately 61.41 acres with the westerly portion encompassing 38.7 acres. Access to the site from Sierra College Blvd. is found on the north and south sides of the creek. Some old, dilapidated machinery and equipment can be found along the southerly access road. The northerly roadway provides access to an abandoned building and exposes some old pieces of metal work and small amounts of various wooden construction materials. These access roads are very short but will be important to the implementation of the proposed project, as well as future maintenance and monitoring efforts and therefore should be maintained in their current locations.

The existing topography of the westerly portion of the site, north of the creek channel and bounded by Sierra College Blvd. on the west, a block retaining wall on the north, and an old barbed wire fence extending from the block wall to near the creek on the east, indicates extensive anthropomorphic manipulations, likely resulting from historic gold mining operations. Most of this historic work appears to have been concentrated within and adjacent to natural swales leading toward the creek though pre-settlement topography can only be guessed at for the purposes of this report. It appears that the mining work left conditions that favored colonization by wetland adapted plant species in the bottom portions of some of these swales. These potentially jurisdictional wetland features were marked on maps provided by others and have been reproduced as colored polygons on our attached map and given codes W1 through W4. The topography of the balance of this sub-area can be characterized as a gently rolling terrain, sloped toward the creek with two areas left relatively flat high above the creek floodway. We have identified these upland habitat areas on our map as U1 which supports a typical oak-foothill pine habitat with a ruderal herbaceous layer and U2 and U3 which are far more open and the soil surface is dominated by non-native grasses and weedy broadleaf plants.

We have mapped the provided potential floodway as polygon R1 in the westerly portion of the site where the vegetation type can be described and valley-foothill riparian. The topography indicates a somewhat incised creek channel, perhaps some remnant channel braids, some swale alluvial termini, and some relatively flat floodplain terrace lands. The vegetation within this polygon consists of a nearly closed canopy made up of valley and live oaks on the higher portions and willow, white alder, and valley oak near the creek. The understory is dominated by the non-native Himalayan blackberry and native poison oak. Some locations support other native vines including California wild grape which climb into the overstory creating an overall relatively densely shaded creek zone which provides multiple benefits to fish living in the creek.

South of and up slope of the creek zone in the westerly portion of the site, is found an extensive oak-foothill pine vegetative community mapped as U5 and another upland ruderal grassland community which we mapped as U4. As on the north side of the creek, the presumed natural micro-topography appears to have been altered some time in the historic past. We assume mining occurred within the swales, later agricultural activities may have altered the grassland areas, and some leveling may have occurred as a part of human use for storage of construction related materials and equipment. We are guessing as to the causes, but the surface disturbance is clearly evident. The large trees covering

much of this area as with the north side indicate that the presumed man-caused disturbances are not recent by any means. Our map shows polygon W6 south of the creek which lies just above a previously mapped intermittent drainage and "heritage" oak tree and incorporates the confluence of two existing swales.

The soils of the site are mapped by NRCS as Andregg coarse sandy loam on the hills above the creek floodway and Xerothents, placer areas within the drainageway. These soils are of granitic parent material and a generally can be described as well drained decomposed granite with numerous granite boulder outcroppings. Previous mining operations and perhaps other disturbances have done much to create a seemingly homogenous mix of the mapped soil types in many areas especially along the creek and swales leading to the creek.

Site Constraints

Wetlands: A map of biologic features identified by Jones & Stokes Associates (JSA) provided by our Client, indicated three potential vernal pool fairy shrimp habitat wetlands in the westerly portion of the site. We found the locations mapped by JSA and determined that two are in all likelihood not potential wetlands and certainly not fairy shrimp habitat. The third which is found north of and upslope from the creek between two mapped swales does support some typical vernal pool vegetation over an area of approximately 100 square feet. While it may well be delineated as a wetland, we would not expect this small isolated depression to support fairy shrimp. However, this depression should be avoided and protected during any construction activities thereby eliminating any need for very expensive vernal pool fairy shrimp habitat mitigation.

For the most part we agree with JSA's depiction of other wetland features and sensitive habitats, the bulk of which are found along the creek and the easily identified swales. However, we located each of the mapped seasonal wetland features and found that the JSA map likely overstates their size and importance. The project will impact some waters of the U.S. and some riparian habitat at the weir construction site which will require mitigation. Therefore, a formal wetland delineation will be necessary for ACOE permit application. The flood zone resulting from the project is not likely to negatively affect any of the existing wetland features.

Listed Species: Restoration Resources obtained the CNDDB records for all listed species of plants and animals occurring within a 5-mile of the site in order to better prepare ourselves for on-site surveys and focus our search on specific habitat types.

Vernal Pool Fairy Shrimp: See discussion under *wetland*s above.

VELB: Data provided by others indicated the presence of elderberry shrubs on the site which are habitat for the federally listed threatened valley elderberry longhorn beetle (VELB). Our survey located the five shrubs previously mapped by JSA along with several more individual plants and elderberry clumps with numerous plants and stems larger than 1-inch diameter at ground level. We did not do protocol level surveys because

of significant conflicts with poison oak, but of the stems we were able to examine we did not see any evidence of VELB exit holes. None the less, these shrubs are protected as critical habitat for the insect and should be avoided during the construction process. The shrubs should be mapped appropriately during the wetland delineation process and suitable plant protection measures including minimum setbacks described along with those for protection of delineated wetlands.

If the project, including any habitat restoration for mitigation, proposes to impact the elderberry shrubs with stems greater than 1-inch at ground level, then approval must be given by USFWS under the section 7 consultation required by the CWA during the ACOE permitting. However, we believe that it will not be necessary to adversely impact any of the elderberry shrubs currently existing on the site thereby eliminating this difficult step.

Northwestern Pond Turtle: The JSA map indicates potential habitat for the northwestern pond turtle, a state listed species of special concern, and we do not disagree. The turtle's habitat is indicated within the riparian and creek habitats all along the Secret Ravine drainageway plus one area that appears to have been an impoundment associated with historic mining activities located north and upslope of the creek near the center of the western portion of the site. We believe that this latter area is a good candidate for wetland and riparian habitat enhancement and creation and should this type of work be done as mitigation, then care would need to be taken to ensure that no turtles were in the area at the time of construction. Review of turtle protection measures will likely come from CDFG during the CEQA process for the project and/or conditions will be placed in the ultimate Streambed Alteration Agreement needed for the weir construction.

Salmonids: Salmon and steelhead trout are known to occur in the Dry Creek drainage and in Secret Ravine itself. During our survey we observed several rainbow trout which could potentially be juvenile steelhead. Therefore, we suggest that the proposed weir design must first be "fish friendly" before it can be a detention facility in order for the project to be permitted for construction. Additionally, the timing of work in and adjacent to the creek will have to recognize the need for salmonids to move up and downstream during their annual reproductive cycle. These issues will need to be addressed in the ACOE permit application to provide information for review by the National Marine Fisheries Service (NMFS) and USFWS under section 7 of CWA consultation requirements.

Archeological Resources: Under section 106 of the CWA, it will be necessary for the project proponent to conduct a protocol level search for evidence of historically or archeologically significant sites. We considered this site likely to contain such protected resources and searched very briefly for evidence of Native American use by looking at a number of exposed granite boulder surfaces where mortar (acorn grinding) holes are often found in the region. The third such inspection yielded a hole and its location is identified on our map. We did not look any further for evidence of archeological resources and we are not able to assess the historical value of the existing building sited north of the creek, but it is likely that an expert will turn up more sites that will require

protection and avoidance as the project including any mitigation habitat construction goes forward.

Oak Trees: Oaks including valley oak, interior live oak and blue oak woodlands are protected by state law and individual oak trees are protected by county and city ordinances. The oak-dominated habitats found on this site have all three species represented and individual trees vary in size from saplings to very old, very large, often multi-trunk giants that will require protection and mitigation if damaged. We have left off our map all reference to "heritage oaks" provided in one of the data sets given us because we were not provided any arborists' reports and this designation is largely subjective and interpreted differently in different jurisdictions. That said, it will be important to the project that an updated arborist's report is prepared in which all native trees larger than six-inches diameter breast height (dbh) are identified, tagged, measured and rated for health and vigor. This report is likely to be extensive due to the large number of trees that will be flooded at some interval more frequent than the current case as a result of the project. It is our opinion that while the existing riparian corridor is well forested, the species present are adapted to relatively frequent flooding and although some species such as blue oak will drop out, the site will become more beneficial to valley oaks under the new hydrologic regime. Our depiction of the more frequently flooded zone is found on our opportunities and constraints map. We do not believe that the threat to oaks will seriously constrain the project, though some will certainly be lost and their loss will necessitate appropriate mitigation.

Construction Season: Typically, construction activities in stream zones is limited by CDFG and the state Water Board to the period between April 15 and October 15th to avoid erosion and unwanted sediment transport issues. Additionally, nesting raptors within the stream zone or adjacent habitat can affect the allowable construction period. Under federal migratory bird protection rules, disruption of nesting activities of other migratory birds may also affect the allowable construction window. Bird nesting activities are generally accepted as being over by July 15. Therefore, we feel the estimated construction period should be limited to July 16 through October 15.

During our site surveys, we located juvenile great horned owls and barn owls in the oak-foothill pine habitat. It is likely that other raptors also nest in this habitat type and potentially in the adjacent riparian habitat type. It is also likely that more than one species of federally recognized migratory birds nest on the site. Prior to construction nesting raptor surveys and perhaps migratory bird surveys will be required if the construction season were to be proposed within the nesting season for any of these species.

Site Opportunities:

Site B presents a significant opportunity to provide a rich, diverse assemblage of preserved, enhanced, restored, and created habitats which could well be used for mitigation for project impacts on this and perhaps other sites. Our Opportunities & Constraints map shows the acreages of various habitat types that potentially could be

enhanced or restored thereby creating suitable in-kind mitigation for all proposed project impacts.

Wetlands: Mapped polygons W2, W3, W4, W5, and W6 all present good potential for creation of additional wetland habitat by construction of small, armored overflow weirs at existing outfalls or constrictions in drainageways. Some additional grading would be required to expand the perimeter of several of the existing basins/depressions in conjunction with weir construction, but we believe that costs will be minimal for the gain in wetland habitat and the likelihood of long-term stability of the created/restored habitats is very high. Some additional technical studies such as soils and hydrology along with detailed biological resource mapping will be needed to prepare final design concepts for agency approval. Also, if Site B is to be used for mitigation purposes it will need to be placed under a conservation easement with an appropriate steward and a long-term management plan will have to be prepared and an endowment to support perpetual stewardship duties must be funded.

VELB: Site B currently supports numerous elderberry shrubs and clumps of elderberry shrubs on high terraces above the floodway. Their presence indicates the suitable nature of the site for future VELB mitigation. As long as vehicular access is maintained and potentially enhanced, the overall site could accommodate a significant number of transplanted elderberry shrubs along with requisite elderberry seedling and associated plant seedling installation making it relatively cost effective for providing this type of mitigation for local public works projects with impacts in need of VELB compensation. As with the potential for wetlands mitigation, a perpetual conservation easement, long-term management plan, and endowment would be required along with a commitment for at least 10 years of protocol level monitoring and reporting to regulatory agencies. Initial plantings would require regular maintenance including irrigation for two to three years and non-chemical weed control. Some replacement planting should be expected in the first three years of establishment maintenance with all maintenance activities being reduced thereafter. This habitat type could provide oak mitigation credits as well.

Oak Trees and Oak Woodlands: Local ordinances and state law require compensatory mitigation for project impacts to oak trees and/or oak woodland habitat. The proposed floodwater detention project will certainly have impacts to these protected resources on Site B and virtually any other site proposed for this type of work. Areas upslope of the creek zone on Site B offer multiple opportunities for oak woodland mitigation. The site lends itself to the more ecologically comprehensive woodland restoration concept as opposed to the more traditional oak plantation/orchard/landscape concept common with "oak tree" mitigations heretofore installed in the region. Woodlands are composed of multiple species of native woody trees, shrubs, and vines along with a herbaceous understory of native perennial grasses and graminoids along with many species of broadleaf plants including typical wildflowers of the foothills.

Restoration Resources has successfully permitted and implemented oak mitigation projects in which we worked from the oak tree paradigm where impacts are measured in "inches at diameter breast height" and mitigations are expressed in numbers of 5- to15-

gallon oak or redwood trees installed in ball parks or street medians to the restored woodland paradigm where all installed plants, the occupied protected land, and the maintenance obligations were considered valuable in replacing the lost oaks. In every case the larger scale mitigation projects will ultimately produce many more oaks than were lost and provide a host of additional habitat values for multiple wildlife species – all at a cost lower than that for installation of many large container sized plants. This habitat type could provide VELB mitigation credits as well.

Site C – Linda Creek Upstream of Auburn-Folsom Road

Prior to our visit to Site C, the Client and RBF Consulting provided a schematic drawing overlaying an aerial photograph of the site. The potential project indicated on this drawing proposes a berm be constructed along the left bank of the Linda Creek tributary and an off-channel detention basin be constructed encompassing something more than the southerly one third of the site. No information is given on the drawing regarding neither the height of the proposed berm nor the depth of the proposed basin. Restoration Resources gathered supporting data and maps and proceeded in the field to verify the constructability and potential constraints to the implementation of the proposed detention facility.

Upon entering the site it was immediately evident that there are multiple existing wetland features and mature oak-dominated riparian vegetation all along the Linda Creek tributary, as well as, significant stands of oak-dominated woodlands throughout the proposed work area. Impacts due to proposed construction to the existing oaks alone would create extensive and expensive mitigation requirements. It should be noted that the site is currently being used as an oak and/or riparian mitigation site (irrigation lines and tree posts supporting installed native riparian trees were found all along the right bank of the tributary). There are also existing sewer lines and manhole covers as well as existing water pipelines paralleling the creek within the proposed area of work. The only area that could potentially be appropriate for a storm water detention basin is the northerly half of the site and it is at an elevation relative to the creek thalweg such that the ability to create a floodwater detention facility at this site seems impractical not to mention that any diversion facility and return facility would have to cross existing sewer and water lines. It is our opinion that the net benefit of creating a detention basin and berm on this site would not exceed impacts associated with the construction. Therefore we do not recommend the use of this site for a flood water detention facility.

Potential Impacts:

- Existing oak trees
- Existing wetland habitat
- Existing riparian habitat
- Existing mitigation plantings
- Potential elderberry shrub impacts throughout
- Salmonid habitat in stream and juvenile entrapment issues

Potential Issues:

- Many existing wetland basins apparently fed by ground water and existing wetland and riparian wetland features including swales
- Extensive mature oak dominated upland and riparian woodlands with potential for multiple impacts to protected resources
- Evidence that portions of the site have been used for oak or riparian mitigation
- Existing water and sewer lines in proposed work areas
- Existing use as landscape pruning dump site

Potential Opportunities:

- Oak mitigation site
- Wetland and riparian wetland and woodland mitigation site
- Elderberry mitigation site

Site D – Linda Creek Upstream of Wedgewood Drive

Site D supports extensive mature riparian woodland and riparian wetland communities within the immediate creek corridor and mature mixed oak-foothill pine woodland rising from near stream bank level to the top of the uppermost slopes adjacent to the channel. The creek corridor is relatively narrow and confined by the steep local topography resulting in a narrow flood impact zone attributable to construction of the proposed weir just upstream of the Wedgewood Road overcrossing. Presumably this narrow zone does not allow for the detention of much flood water unless the weir structure is of significant height in which case flood waters will rise into to the adjacent upland oak woodlands.

This site is located entirely within an exclusive gated residential community adjacent to the Granite Bay Golf Club and the development has strict Covenants, Conditions and Restrictions for architectural and landscaping standards. No private perimeter fencing is visible and most of the pre-existing oaks have been retained within the community presumably to enhance the feeling of living compatibly with nature for the residents. It is our belief that any attempt to construct a large concrete weir across a beloved stream within a community open space will be met with significant resistance. Additionally, the currently existing riparian habitat will be impacted and the adjacent mature live oaks, blue oaks, and foothill pines will likely suffer death from even infrequent flooding. Therefore, it is our opinion that this site is not a good candidate for the flood attenuation project and deserves no further evaluation.

Site E – Linda Creek Upstream of Old Auburn Road

Site E encompasses a relatively incised narrow channel with steep, nearly vertical stream banks bordered by uplands dominated by oak woodland and annual non-native grass/forb vegetative communities. Typical valley riparian woody species including cottonwood and willows are scattered rather sparsely along the length of Linda Creek and found mostly on the left bank. The upland area to the west of the creek identified by RBF Consulting as

suitable for off-channel flood water detention is currently completely occupied by oak tree mitigation plantings regularly tended by City of Roseville personnel.

We believe that it is highly unlikely that the City of Roseville will support complete destruction of this mitigation site without the extraordinary expense of replacing the land area and all the trees and extending tree maintenance and tree survivorship guarantees for some considerable time into the future. The chosen site seems well suited for the type of installation proposed with the berm constructed from spoils excavated within the detention basin; however, we believe that do to its existing use for mitigation, Site E is not a good candidate for the flood control project and, unless cost is of no concern, should not be considered further.

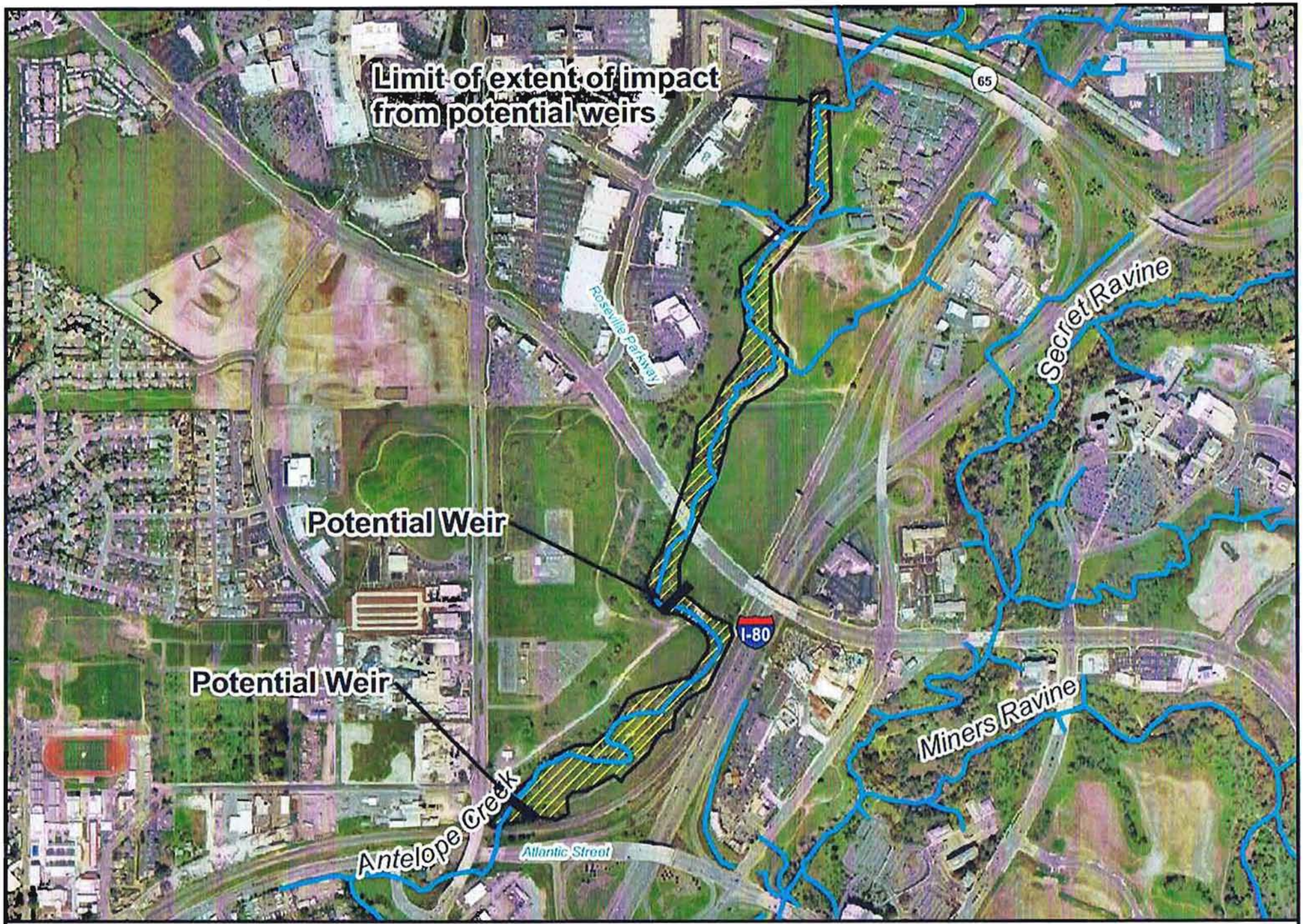
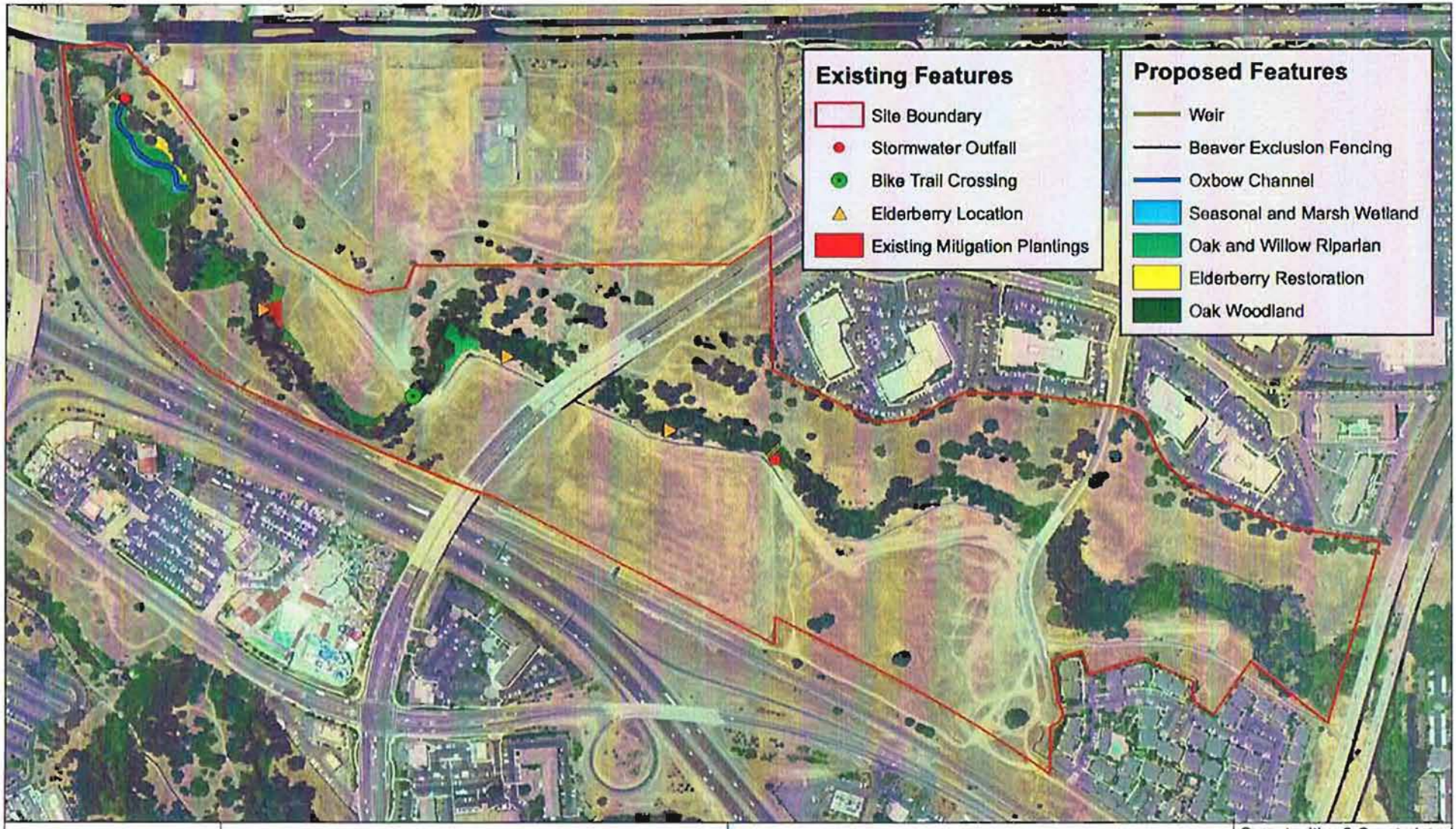


Exhibit 1
Potential Project
Antelope Creek upstream from Atlantic Street

N

0 162.5 325 650 Feet

RBF CONSULTING



RESTORATION RESOURCES

N

0 375 750 1,500 Feet

Site A:
Antelope Creek Upstream of Atlantic Street

Opportunities & Constraints

Dry Creek Watershed
Placer County, CA
July 30, 2010

Site A: Large valley oak within the flood zone. Attention should be given to weir design and duration of flood up to prevent detriment to existing protected vegetation.

Site A: Parrots feather and concrete outfall. Noxious non-native vegetation should be treated and removed as part of the riparian enhancement.

Site A: Open Floodplain on downstream end of Antelope Creek. We suggest this site be used for wetland restoration ("Oxbow").

Site A: Existing Mounds of soil along Antelope Creek may be enhanced and created elsewhere on site to provide hydrologic/soil conditions for elderberry plantings.

Site A: Red sesbania. Noxious non-native vegetation should be treated and removed as part of the riparian enhancement.

Site A: Himalayan blackberry. Noxious non-native vegetation should be treated and removed as part of the riparian enhancement.

Site A: Bike trail crossing inlet. Pipes should be cleared and maintained. We suggest a beaver exclusion device be installed upstream of this location.

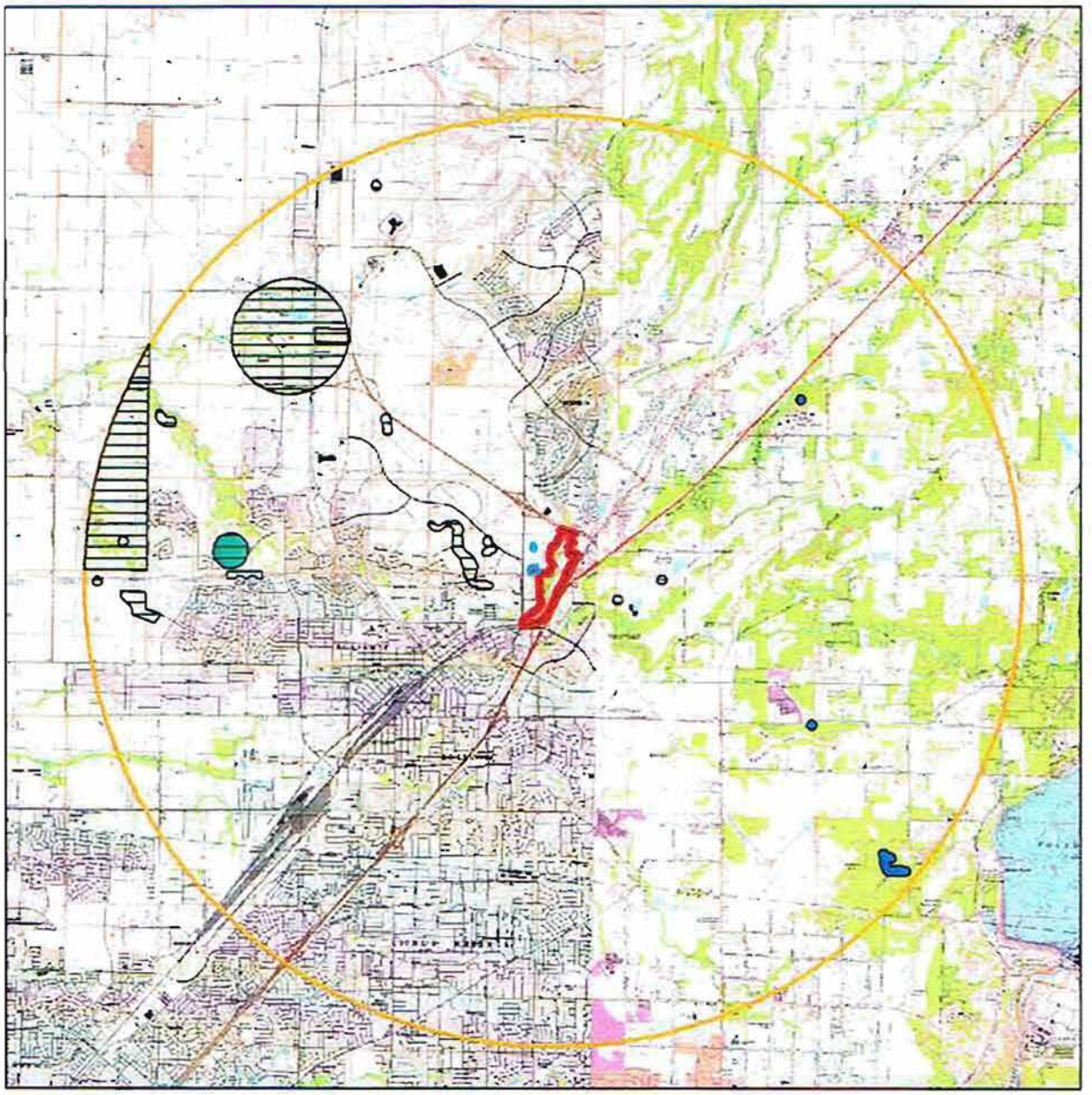
Site A: Bike trail crossing outlet. It is suggested that concrete slabs be removed and disposed of legally off site or used for upland habitat structures.

Site A: Oak tree mitigation plantation. There is a location on Antelope Creek that has been used for what seems to be oak tree mitigation plantings.

Site A: Oak tree mitigation plantation. Trees were planted in dense rows discouraging the development of a diverse and appropriately structured oak riparian woodland

Site A: Lower benches. Adjacent to the oak tree mitigation site at the base of the capped landfill there are sites suitable for additional oak plantings.

Site A: Lower benches. There are multiple locations along Antelope Creek at the base of the capped landfill that are suitable for oak tree mitigation plantings.



Legend

Plant and Animals (Common Name)

- vernal pool tadpole shrimp
- California black rail
- Boggs Lake hedge-hyssop
- Swainson's hawk
- valley elderberry longhorn beetle
- vernal pool fairy shrimp

California Natural Diversity Database Map	
Site Analysis- 5 mile radius	
Site A - Antelope Creek (upstream of Atlantic Street)	
Designed By: LRP	Prepared By: RESTORATION RESOURCES
Drafted By: LRP	
Date: 7.30.10	Job No.: 29001

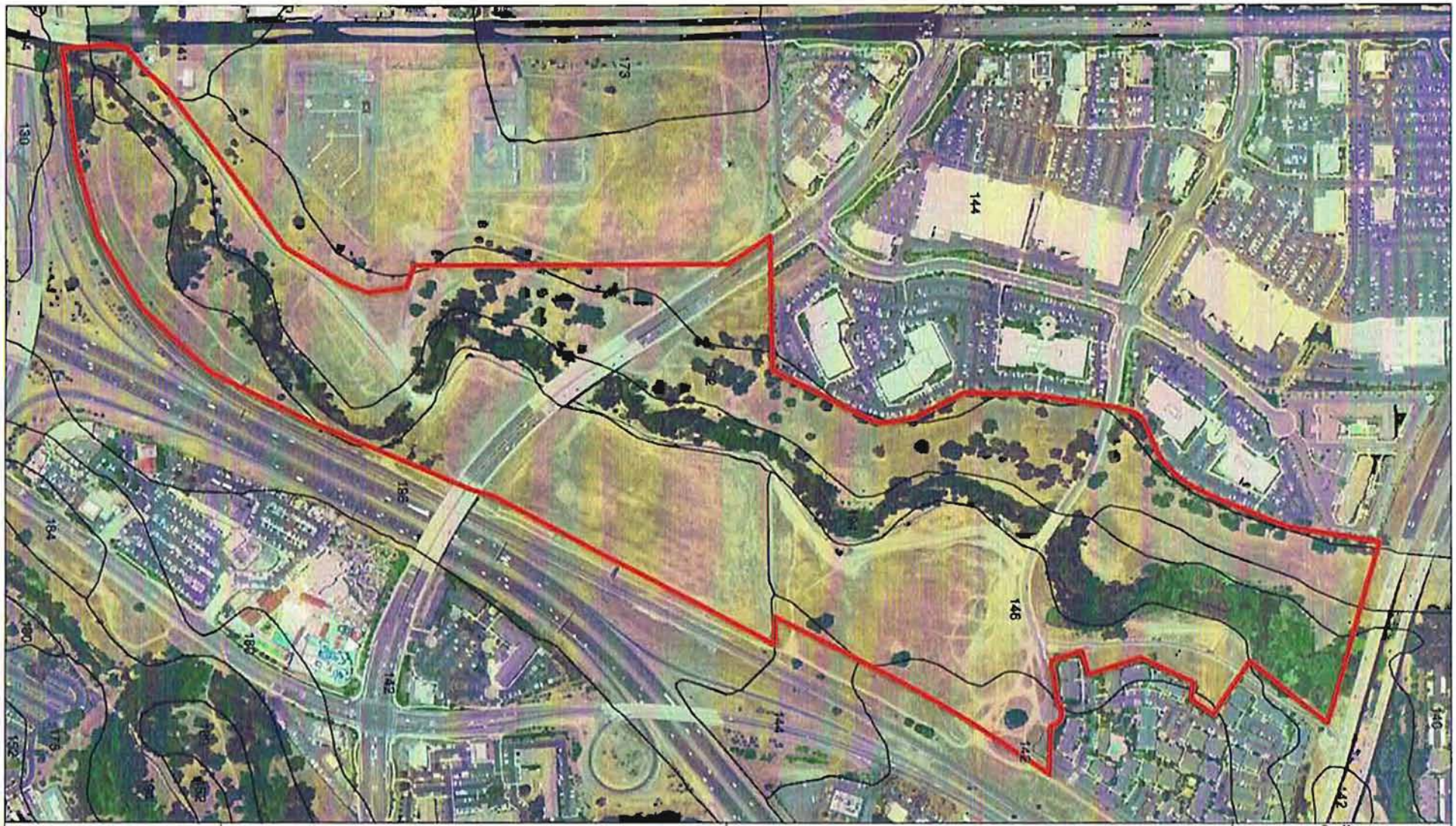
Legend

- Site Boundary
- 5mile buffer

N W E S

1:110,000

0 0.5 1 2 Miles



RESTORATION RESOURCES

N

0 375 750 1,000 Feet

Site A:
Antelope Creek Upstream of Atlantic Street

Soils

Dry Creek Watershed
Placer County, CA
July 30, 2010

Map Unit Description

Placer County, California, Western Part

140 Cometa sandy loam, 1 to 5 percent slopes

Setting

Elevation: 20 to 400 feet
Mean annual precipitation: 10 to 23 inches
Mean annual air temperature: 63 to 63 degrees F
Frost-free period: 260 to 300 days

Composition

Cometa and similar soils: 85 percent
Minor components: 15 percent

Description of Cometa

Setting

Landform: Terraces
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Properties and Qualities

Slope: 1 to 5 percent
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low or moderately low (0.00 to 0.06 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Low (about 5.2 inches)

Interpretive Groups

Land capability classification (irrigated): 3e
Land capability (non irrigated): 3e

Typical Profile

0 to 18 inches: sandy loam
18 to 29 inches: clay
29 to 60 inches: sandy loam

Minor Components

Kaseburg soils
Percent of map unit: 5 percent

Fiddyment soils
Percent of map unit: 5 percent

San joaquin soils
Percent of map unit: 4 percent

Alamo soils
Percent of map unit: 1 percent
Landform: Depressions

Map Unit Description

Placer County, California, Western Part

142 Cometa-Ramona sandy loams, 1 to 5 percent slopes

Setting

Elevation: 20 to 3500 feet
Mean annual precipitation: 10 to 23 inches
Mean annual air temperature: 53 to 63 degrees F
Frost-free period: 230 to 320 days

Composition

Cometa and similar soils: 50 percent
Ramona and similar soils: 30 percent
Minor components: 20 percent

Description of Cometa

Setting

Landform: Terraces
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Properties and Qualities

Slope: 1 to 5 percent
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low or moderately low (0.00 to 0.06 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Low (about 5.5 inches)

Interpretive Groups

Land capability classification (irrigated): 3e
Land capability (non irrigated): 3e

Typical Profile

0 to 18 inches: sandy loam
18 to 29 inches: clay
29 to 60 inches: sandy loam

Description of Ramona

Setting

Landform: Terraces
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Properties and Qualities

Slope: 1 to 5 percent
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Moderate (about 8.2 inches)

Interpretive Groups

Land capability classification (irrigated): 3e
Land capability (non irrigated): 3e

Typical Profile

0 to 6 inches: sandy loam
6 to 14 inches: loam

14 to 55 inches: sandy clay loam
55 to 73 inches: gravelly sandy loam

Minor Components

San joaquin soils
Percent of map unit: 5 percent

Fiddyment soils
Percent of map unit: 5 percent

Alamo soils
Percent of map unit: 5 percent
Landform: Depressions

Xerofluvent soils
Percent of map unit: 5 percent
Landform: Drainageways

Map Unit Description

Placer County, California, Western Part

146 Fiddyment loam, 1 to 8 percent slopes

Setting

Elevation: 50 to 280 feet
Mean annual precipitation: 19 to 19 inches
Mean annual air temperature: 61 to 61 degrees F
Frost-free period: 230 to 300 days

Composition

Fiddyment and similar soils: 85 percent
Minor components: 15 percent

Description of Fiddyment

Setting

Landform: Terraces
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from siltstone

Properties and Qualities

Slope: 1 to 8 percent
Depth to restrictive feature: 20 to 35 inches to Duripan; 28 to 35 inches to Duripan; 35 to 39 inches to Lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Very low (about 2.7 inches)

Interpretive Groups

Land capability classification (irrigated): 4e
Land capability (non irrigated): 4e

Typical Profile

0 to 12 inches: loam
12 to 28 inches: clay loam
28 to 35 inches: indurated
35 to 39 inches: weathered bedrock

Minor Components

Cometa soils

Percent of map unit: 5 percent

Kaseburg soils

Percent of map unit: 5 percent

San joaquin soils

Percent of map unit: 3 percent

Alamo soils

Percent of map unit: 2 percent
Landform: Depressions

Map Unit Description

Placer County, California, Western Part

152 Inks cobbly loam, 2 to 30 percent slopes

Setting

Elevation: 200 to 2000 feet
Mean annual precipitation: 30 to 30 inches
Mean annual air temperature: 61 to 61 degrees F
Frost-free period: 175 to 270 days

Composition

Inks and similar soils: 80 percent
Minor components: 20 percent

Description of Inks

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from conglomerate

Properties and Qualities

Slope: 2 to 30 percent
Surface area covered with stones and boulders: 2.0 percent
Depth to restrictive feature: 18 to 22 inches to Paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low or moderately low (0.00 to 0.06 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Very low (about 1.8 inches)

Interpretive Groups

Land capability classification (irrigated): 4e
Land capability (non irrigated): 4e
Ecological site: SHALLOW LOAMY (R018XD076CA)

Typical Profile

0 to 5 inches: cobbly loam
5 to 18 inches: very cobbly loam
18 to 22 inches: unweathered bedrock

Minor Components

Inks varient cobbly loam soils
Percent of map unit: 10 percent

Exchequer very stony loam soils
Percent of map unit: 10 percent

Map Unit Description

Placer County, California, Western Part

194 Xerofluvents, frequently flooded

Setting

Elevation: 0 to 1500 feet
Mean annual precipitation: 14 to 20 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 250 to 270 days

Composition

Xerofluvents, frequently flooded, and similar soils: 90 percent
Minor components: 10 percent

Description of Xerofluvents, frequently flooded

Setting

Landform: Drainageways
Landform position (two-dimensional): Toeslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Properties and Qualities

Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.20 to 1.98 in/hr)
Depth to water table: About 30 to 57 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate maximum: 5 percent
Gypsum maximum: 0 percent
Available water capacity: Moderate (about 8.1 inches)

Interpretive Groups

Land capability classification (irrigated): 4w
Land capability (non irrigated): 4w

Typical Profile

0 to 15 inches: stratified loamy sand to fine sandy loam
15 to 37 inches: stratified loamy sand to fine sandy loam to silt loam
37 to 55 inches: stratified loam to silty clay loam to clay

Minor Components

Unnamed soils

Percent of map unit: 10 percent
Landform: Drainageways

Map Unit Description

Placer County, California, Western Part

196 Xerorthents, cut and fill areas

Setting

Elevation: 400 to 3500 feet
Mean annual precipitation: 8 to 18 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 200 to 300 days

Composition

Xerorthents and similar soils: 90 percent
Minor components: 10 percent

Description of Xerorthents

Setting

Anthropogenic features: Fills
Parent material: Mine spoil or earthy fill

Properties and Qualities

Slope: 2 to 50 percent
Drainage class: Well drained
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups

Land capability (non irrigated): 8e

Typical Profile

0 to 60 inches: variable

Minor Components

Unnamed soils
Percent of map unit: 10 percent

Map Unit Description

Detailed Soil Map Units

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description indicates the composition of the map unit and selected properties of the components of the unit.

Soils that have profiles that are almost alike make up a "soil series." Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into "soil phases." Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A "complex" consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An "association" is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An "undifferentiated group" is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include "miscellaneous areas." Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other Soil Data Mart reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the Soil Data Mart reports define some of the properties included in the map unit descriptions.

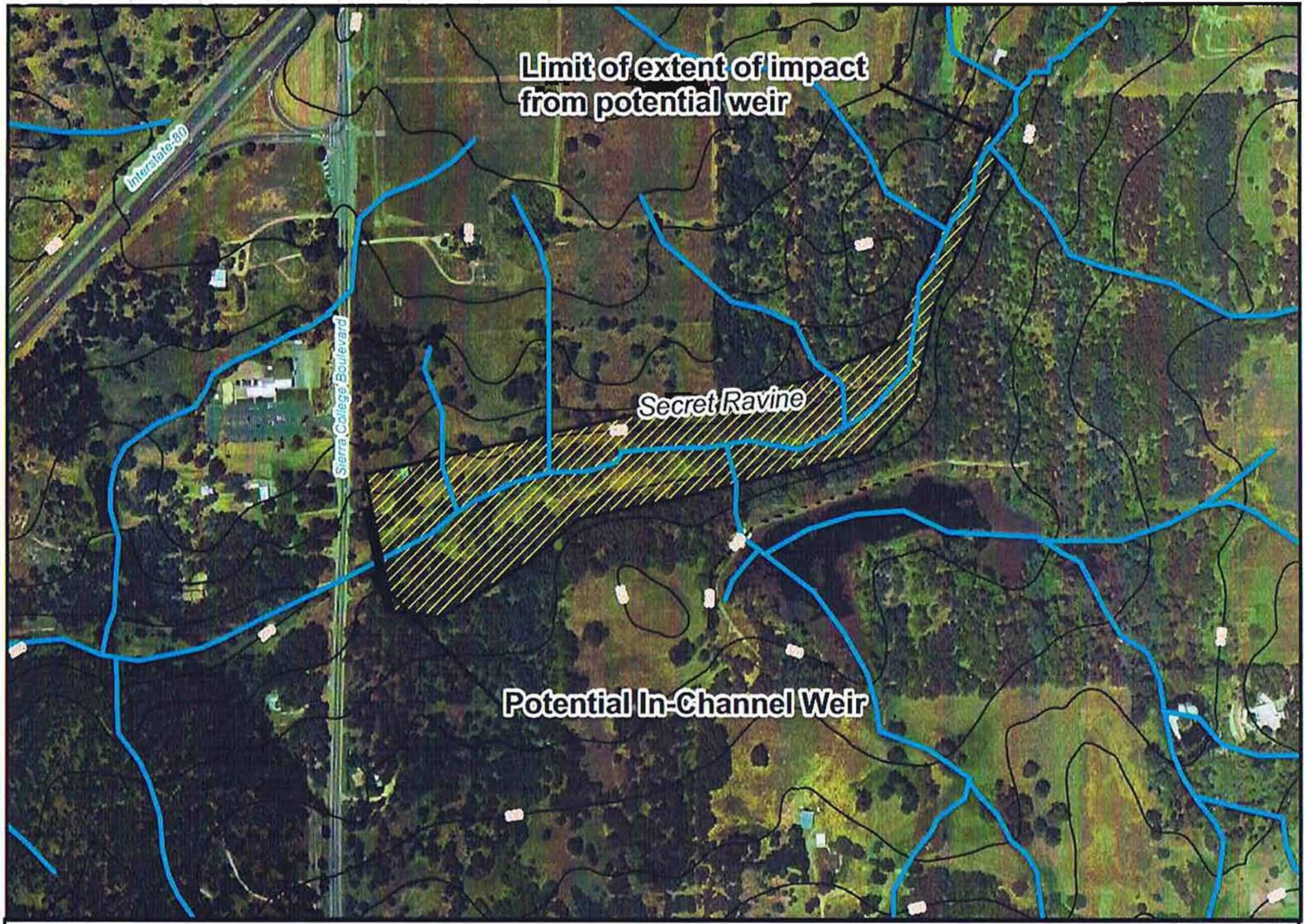
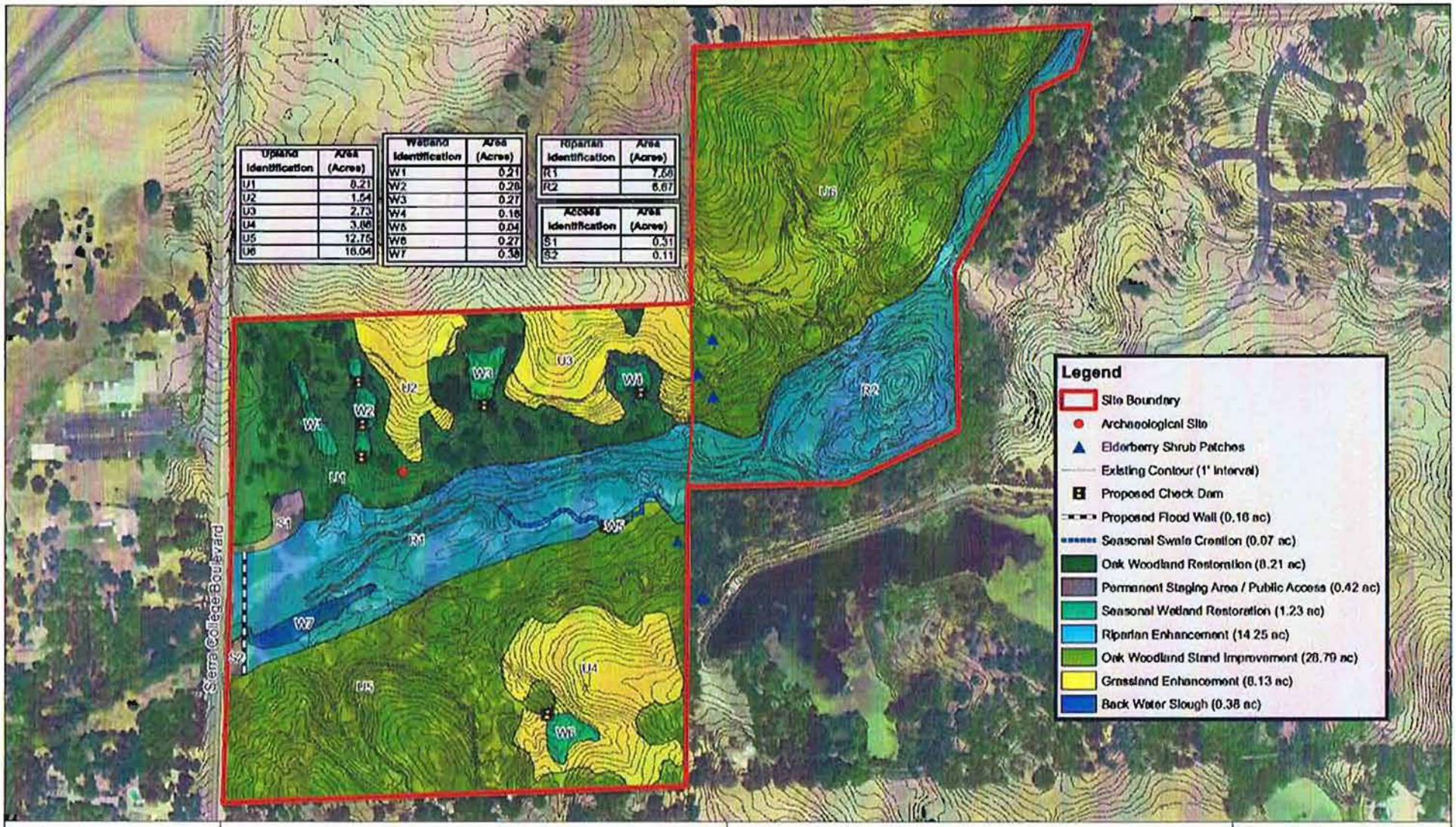


Exhibit 8
Potential Project
Secret Ravine upstream of Sierra College Boulevard

N

0 100 200 400 Feet

RBF CONSULTING



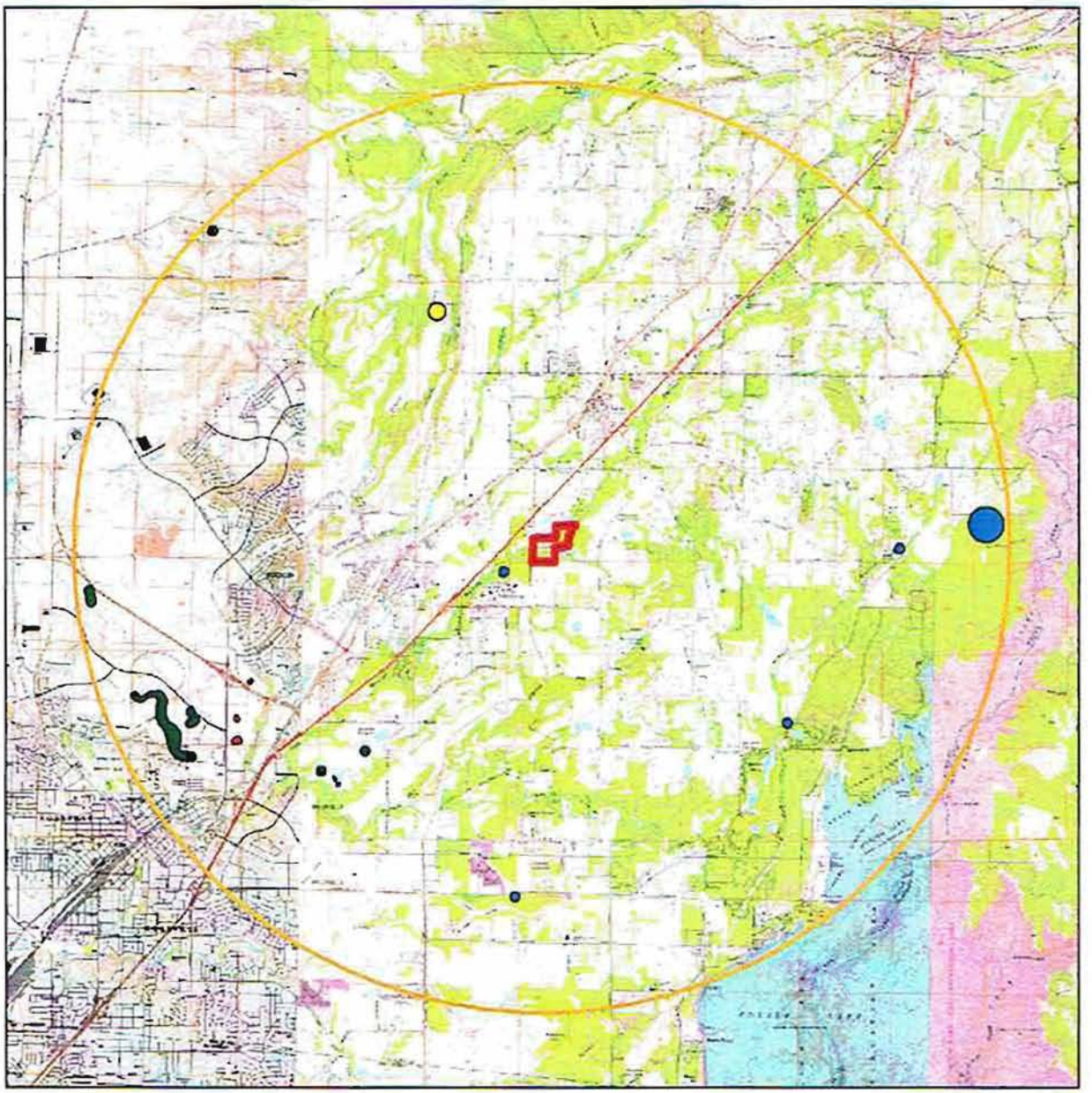
RESTORATION RESOURCES

N

Site B:
Secret Ravine Upstream of Sierra College Boulevard

Opportunities & Constraints

Dry Creek Watershed
Placer County, CA
July 30, 2010



Legend

Plant and Animals (Common Name)

- Boggs Lake hedge-hyssop
- California black rail
- valley elderberry longhorn beetle
- vernal pool fairy shrimp

California Natural Diversity Database Map	
Site Analysis- 5 mile radius	
Site B - Secret Ravine (upstream of Sierra College Boulovard)	
Designed By: LRP	Prepared By: RESTORATION RESOURCES
Drafted By: LRP	
Date: 7.30.10	Job No.: 29001

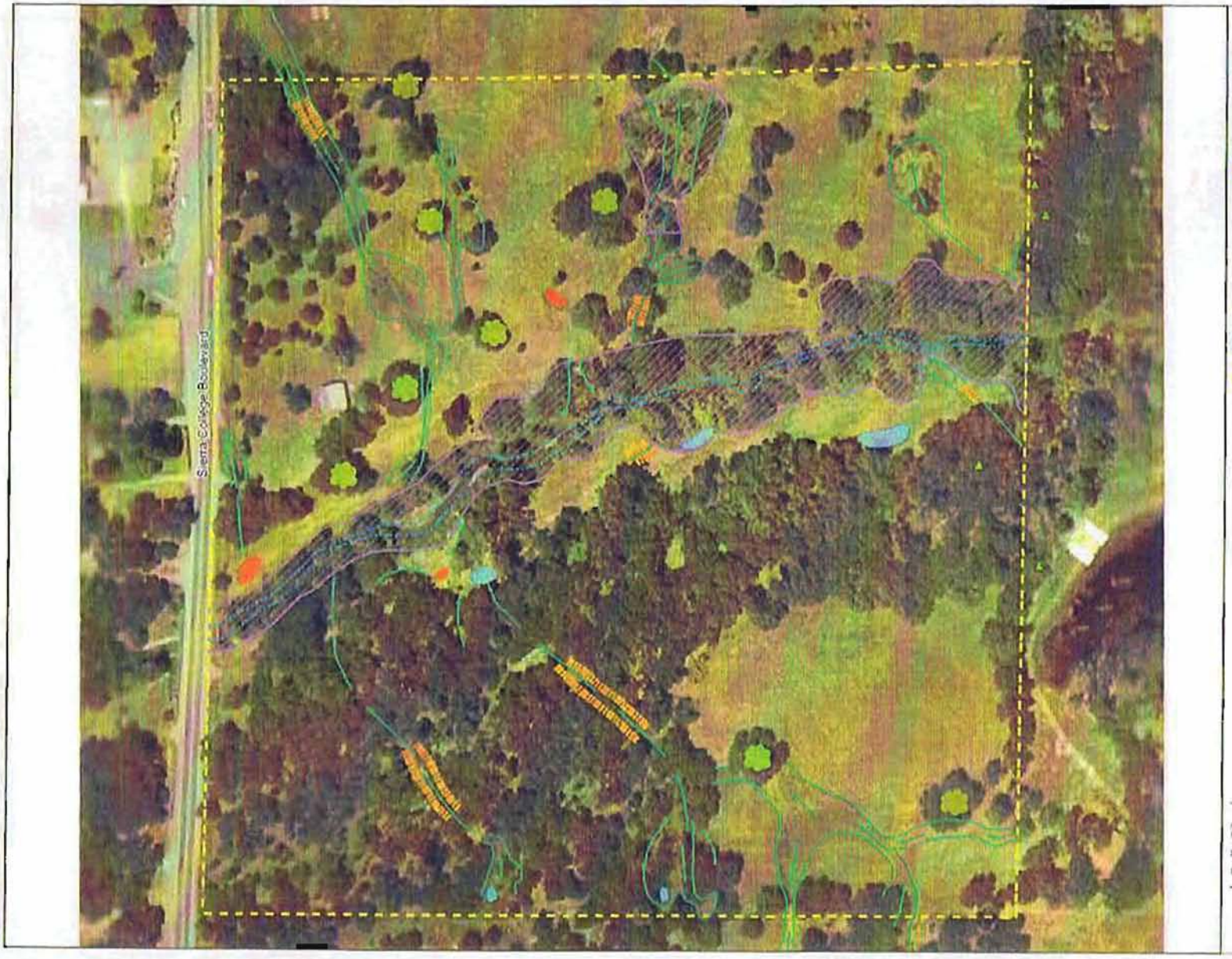
Legend

- Site Boundary
- 5mile buffer

N W E S

1:110,000

0 0.5 1 2 Miles



Biological Resources

Legend

- Swale Flow Direction
- Limit of Swale
- Bed and Bank of Intermittent Stream
- Seasonal Wetland
- Potential Vernal Pool Fairy Shrimp Habitat
- Riparian Woodland
- Elderberry Shrub
- Heritage Oak Tree
- Secret Ravine (Potential Northwestern Pond Turtle Habitat)
- Project Site Boundary

150 75 0
Feet

N

Aerial Photo Source: Google Earth 2005

Notes:
1. Location of identified biological features is approximate. GPS points were not taken for these features.
2. Potential vernal pool fairy shrimp habitat throughout project area requires further investigation to determine suitability.
3. Not all heritage oaks are identified.

Jones & Stokes

LEGEND:

- FLOODPLAIN AREAS 1, 2, & 3 FROM ANDREGG GEOMATICS
- PROPOSED FLOODPLAIN EXTENTS FROM HEC-RAS MODELING AND TOPOGRAPHIC DATA OF CROFTWOOD AREA
- POTENTIAL REVISED BOUNDARY
- POTENTIAL EXPANDED FLOODPLAIN AREA (APPROXIMATELY 82 +/- ACRES)

FIGURE 1

PROJECT FLOODPLAIN LOCATION

SECRET RAVINE

FLOODPLAIN RESTORATION PROJECT

PLACER COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

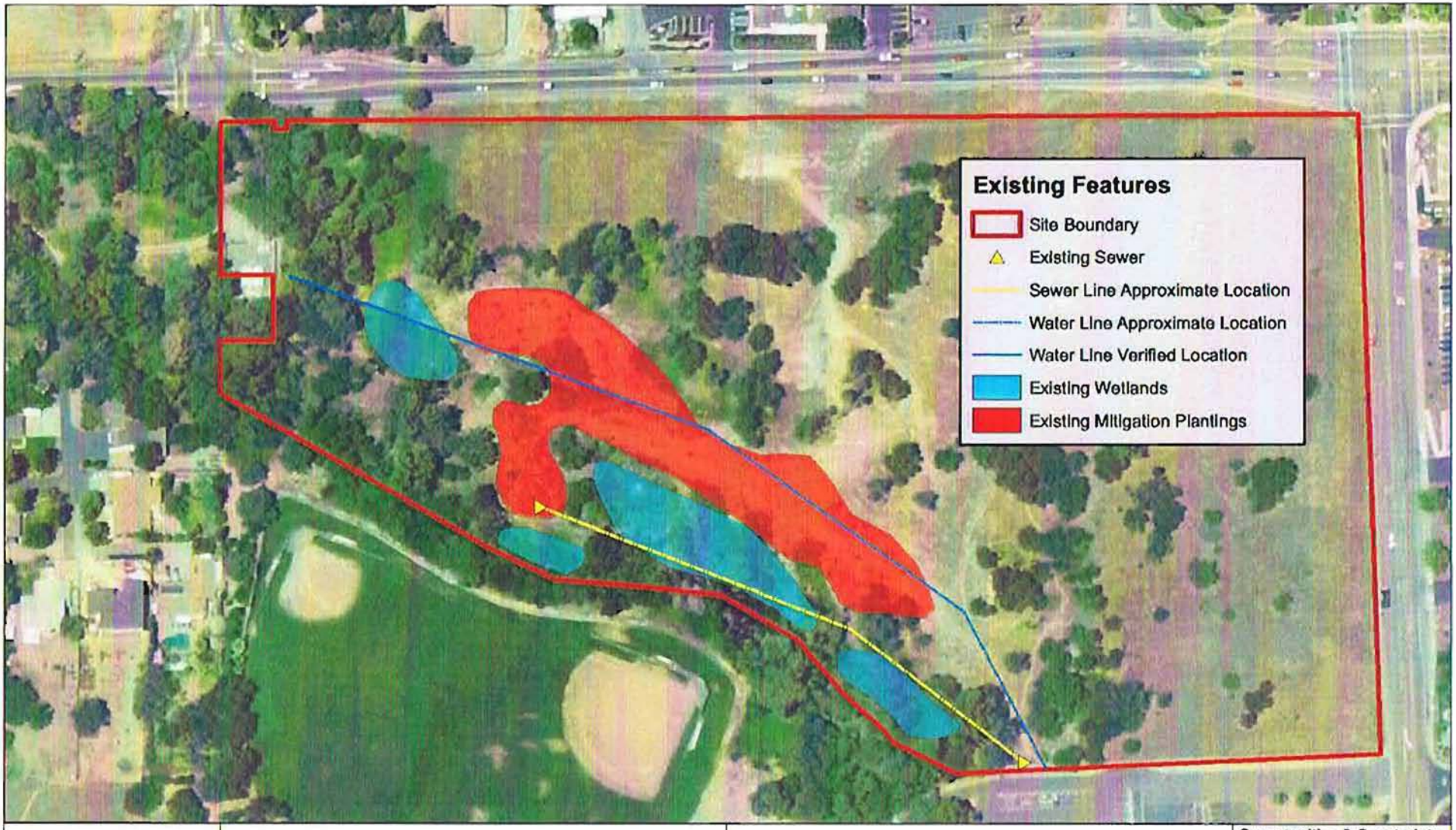
RBF CONSULTING

Exhibit 2
Potential Project
Linda Creek upstream Auburn-Folsom Road

N

0 50 100 200 Feet

RBF CONSULTING



RESTORATION RESOURCES

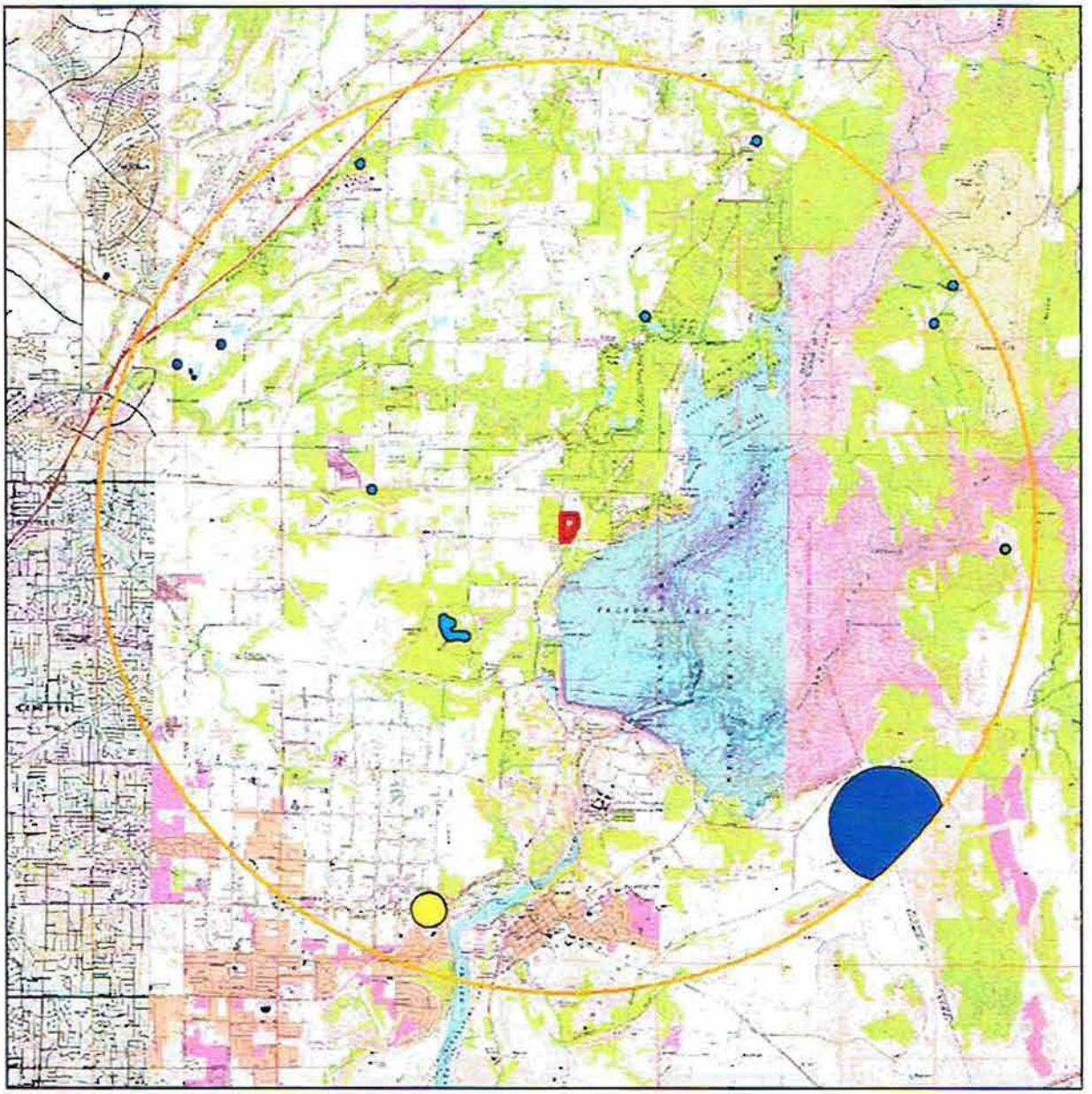
N

0 125 250 500 Feet

Site C:
Linda Creek Upstream of Auburn-Folsom Road

Opportunities & Constraints

Dry Creek Watershed
Placer County, CA
July 30, 2010



Legend

Plant and Animals (Common Name)

- Boggs Lake hedge-hyssop
- California red-legged frog
- Sacramento Orcutt grass
- valley elderberry longhorn beetle
- vernal pool fairy shrimp

California Natural Diversity Database Map	
Site Analysis- 5 mile radius	
Site C - Linda Creek (upstream of Auburn-Folsom)	
Designed By: LRP	Prepared By: RESTORATION RESOURCES
Drafted By: LRP	
Date: 7.30.10	Job No : 29001

Legend

- Site Boundary
- 5mile buffer

1:110,000

0 0.5 1 2 Miles

RESTORATION RESOURCES

N

0 125 250 500 Feet

Site C:
Linda Creek Upstream of Auburn-Folsom Road

Soils

Dry Creek Watershed
Placer County, CA
July 30, 2010

Map Unit Description

Placer County, California, Western Part

106 Andregg coarse sandy loam, 2 to 9 percent slopes

Setting

Landscape: Foothills
Elevation: 200 to 1500 feet
Mean annual precipitation: 12 to 35 inches
Mean annual air temperature: 61 to 61 degrees F
Frost-free period: 200 to 270 days

Composition

Andregg and similar soils: 85 percent
Minor components: 15 percent

Description of Andregg

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from granite

Properties and Qualities

Slope: 2 to 9 percent
Depth to restrictive feature: 29 to 33 inches to Paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low or moderately low (0.00 to 0.06 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Low (about 3.5 inches)

Interpretive Groups

Land capability classification (irrigated): 3e
Land capability (non irrigated): 3e
Ecological site: GRANITIC (R018XD080CA)

Typical Profile

0 to 15 inches: coarse sandy loam
15 to 29 inches: coarse sandy loam
29 to 33 inches: weathered bedrock

Minor Components

Caperton soils
Percent of map unit: 5 percent

Sierra soils
Percent of map unit: 5 percent

Unnamed, mod deep soils
Percent of map unit: 4 percent

Unnamed soils
Percent of map unit: 1 percent
Landform: Drainageways

Map Unit Description

Placer County, California, Western Part

109 Andregg coarse sandy loam, rocky, 2 to 15 percent slopes

Setting

Landscape: Foothills
Elevation: 200 to 1500 feet
Mean annual precipitation: 12 to 35 inches
Mean annual air temperature: 61 to 61 degrees F
Frost-free period: 200 to 270 days

Composition

Andregg and similar soils: 85 percent
Minor components: 15 percent

Description of Andregg

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from granite

Properties and Qualities

Slope: 2 to 15 percent
Depth to restrictive feature: 29 to 33 inches to Paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low or moderately low (0.00 to 0.06 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Low (about 3.5 inches)

Interpretive Groups

Land capability classification (irrigated): 4e
Land capability (non irrigated): 4e
Ecological site: GRANITIC (R018XD080CA)

Typical Profile

0 to 15 inches: coarse sandy loam
15 to 29 inches: coarse sandy loam
29 to 33 inches: weathered bedrock

Minor Components

Sierra soils

Percent of map unit: 5 percent

Caperton soils

Percent of map unit: 5 percent

Unnamed soils

Percent of map unit: 2 percent

Xerofluvents soils

Percent of map unit: 2 percent
Landform: Drainageways

Unnamed soils

Percent of map unit: 1 percent
Landform: Drainageways

Map Unit Description

Placer County, California, Western Part

196 Xerorthents, cut and fill areas

Setting

Elevation: 400 to 3500 feet
Mean annual precipitation: 8 to 18 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 200 to 300 days

Composition

Xerorthents and similar soils: 90 percent
Minor components: 10 percent

Description of Xerorthents

Setting

Anthropogenic features: Fills
Parent material: Mine spoil or earthy fill

Properties and Qualities

Slope: 2 to 50 percent
Drainage class: Well drained
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups

Land capability (non irrigated): 8e

Typical Profile

0 to 60 inches: variable

Minor Components

Unnamed soils
Percent of map unit: 10 percent

Map Unit Description

Placer County, California, Western Part

197 Xerorthents, placer areas

Setting

Elevation: 50 to 3200 feet
Mean annual precipitation: 8 to 18 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 150 to 280 days

Composition

Xerorthents and similar soils: 90 percent
Minor components: 10 percent

Description of Xerorthents

Setting

Anthropogenic features: Spoil piles
Parent material: Mine spoil or earthy fill

Properties and Qualities

Slope: 2 to 5 percent
Drainage class: Well drained
Depth to water table: More than 6 feet
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups

Land capability (non irrigated): 7s
Ecological site: PLACER DIGGINGS (R018XD084CA)

Typical Profile

0 to 60 inches: variable

Minor Components

Unnamed soils

Percent of map unit: 10 percent
Landform: Drainageways

Map Unit Description

Detailed Soil Map Units

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A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

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The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes the composition of the map unit and selected properties of the components of the unit.

Soils that have profiles that are almost alike make up a "soil series." Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into "soil phases." Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A "complex" consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

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Some surveys include "miscellaneous areas." Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other Soil Data Mart reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the Soil Data Mart reports define some of the properties included in the map unit descriptions.

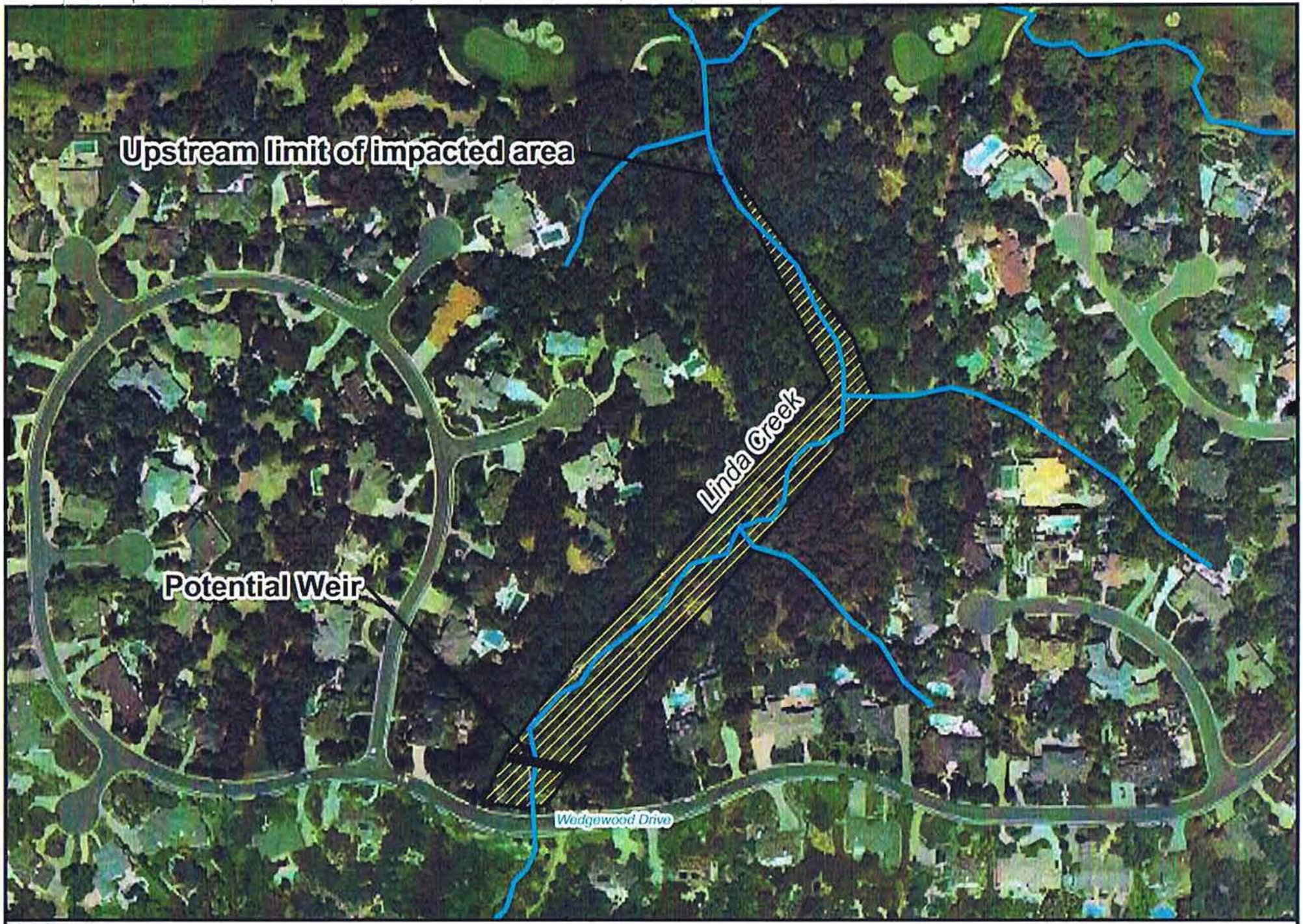


Exhibit 3
Potential Project
Linda Creek upstream from Wedgewood Drive

N

0 40 80 160 Feet

RBF CONSULTING

RESTORATION RESOURCES

N

0 125 250 500 Feet

Site D:
Linda Creek Upstream of Wedgewood Drive

Opportunities & Constraints

Dry Creek Watershed
Placer County, CA
July 30, 2010

Map Unit Description

Placer County, California, Western Part

129 Caperton gravelly coarse sandy loam, 2 to 30 percent slopes

Setting

Landscape: Foothills
Elevation: 200 to 1500 feet
Mean annual precipitation: 20 to 35 inches
Mean annual air temperature: 61 to 61 degrees F
Frost-free period: 220 to 270 days

Composition

Caperton and similar soils: 85 percent
Minor components: 15 percent

Description of Caperton

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from granite

Properties and Qualities

Slope: 2 to 30 percent
Depth to restrictive feature: 18 to 22 inches to Paralithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low or moderately low (0.00 to 0.06 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Very low (about 1.8 inches)

Interpretive Groups

Land capability classification (irrigated): 6e
Land capability (non irrigated): 6e
Ecological site: SHALLOW GRANITIC (R018XD098CA)

Typical Profile

0 to 18 inches: gravelly coarse sandy loam
18 to 22 inches: weathered bedrock

Minor Components

Andregg soils

Percent of map unit: 10 percent

Shenendoah soils

Percent of map unit: 2 percent

Unnamed, mod. deep soils

Percent of map unit: 2 percent

Unnamed soils

Percent of map unit: 1 percent
Landform: Drainageways

RESTORATION RESOURCES

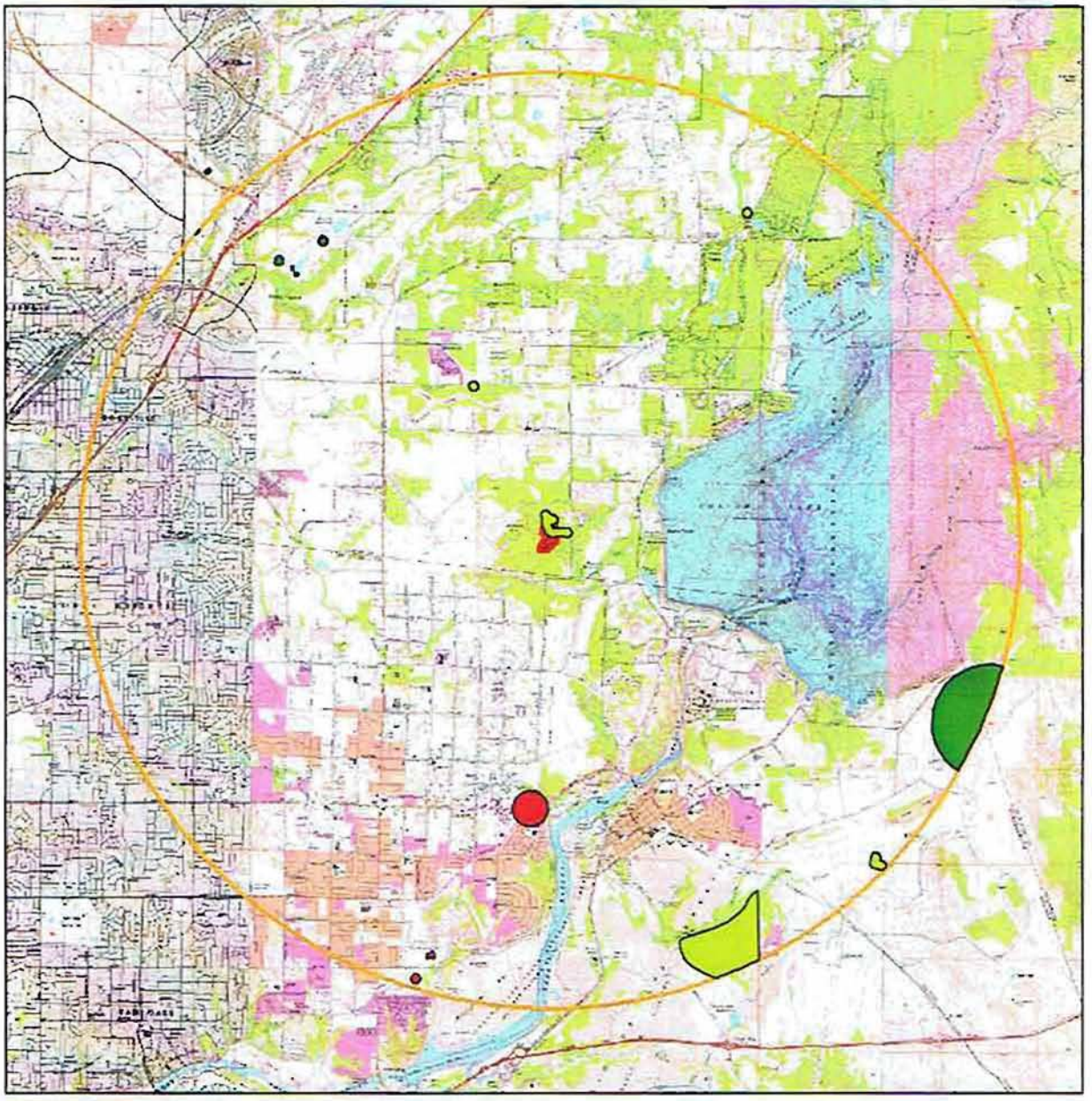
N

0 125 250 500 Feet

Site D:
Linda Creek Upstream of Wedgewood Drive

Opportunities & Constraints

Dry Creek Watershed
Placer County, CA
July 30, 2010



Legend

Plant and Animals (Common Name)

- Boggs Lake hedge-hyssop
- Sacramento Orcutt grass
- valley elderberry longhorn beetle
- vernal pool fairy shrimp

California Natural Diversity Database Map	
Site Analysis- 5 mile radius	
Site D - Linda Creek (upstream of Wedgewood Drive)	
Designed By: LRP	Prepared By: RESTORATION RESOURCES
Drafted By: LRP	
Date: 7.30.10	Job No : 29001

Legend

- Site Boundary
- 5mile buffer

N W E S

1:110,000

0 0.5 1 2 Miles

Map Unit Description

Detailed Soil Map Units

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description indicates the composition of the map unit and selected properties of the components of the unit.

Soils that have profiles that are almost alike make up a "soil series." Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into "soil phases." Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A "complex" consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An "association" is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An "undifferentiated group" is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include "miscellaneous areas." Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other Soil Data Mart reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the Soil Data Mart reports define some of the properties included in the map unit descriptions.

Appendix E

Exhibit 4
Potential Project
Linda Creek upstream from Old Auburn Road

N

RBF CONSULTING

RESTORATION RESOURCES

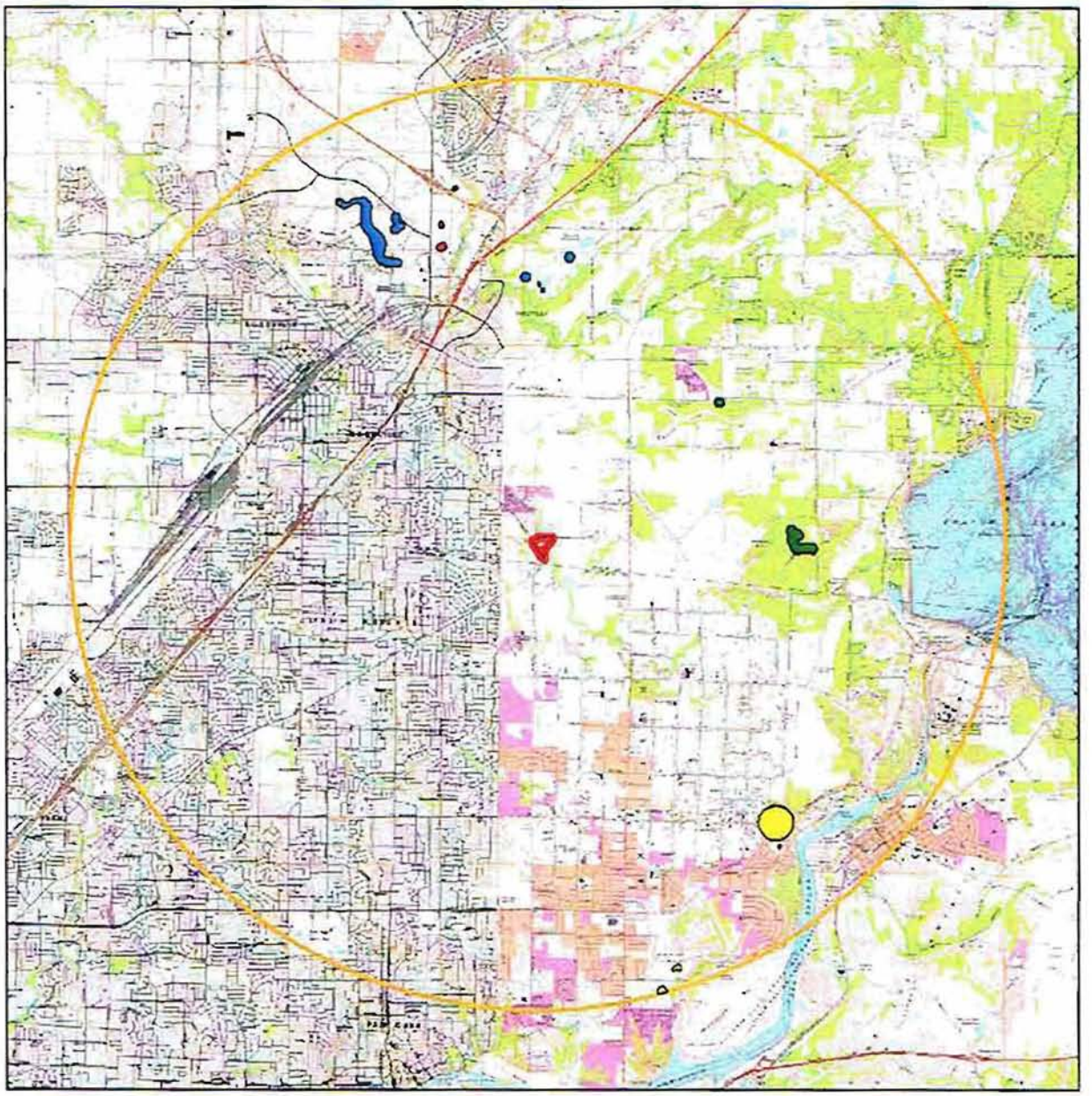
N

0 125 250 500 Feet

Site E:
Linda Creek Upstream of Old Auburn Road

Opportunities & Constraints

Dry Creek Watershed
Placer County, CA
July 30, 2010



Legend

Plant and Animals (Common Name)

- Boggs Lake hedge-hyssop
- Sacramento Orcutt grass
- valley elderberry longhorn beetle
- vernal pool fairy shrimp

California Natural Diversity Database Map	
Site Analysis- 5 mile radius	
Site E - Linda Creek (upstream of Old Auburn Road)	
Designed By: LRP	Prepared By: RESTORATION RESOURCES
Drafted By: LRP	
Date: 7.30.10	Job No: 29001

Legend

- Site Boundary
- 5mile buffer

N W E S

1:110,000

0 0.5 1 2 Miles

RESTORATION RESOURCES

N

0 125 250 500 Feet

Site E:
Linda Creek Upstream of Old Auburn Road

Soils

Dry Creek Watershed
Placer County, CA
July 30, 2010

Map Unit Description

Placer County, California, Western Part

146 Fiddyment loam, 1 to 8 percent slopes

Setting

Elevation: 50 to 280 feet
Mean annual precipitation: 19 to 19 inches
Mean annual air temperature: 61 to 61 degrees F
Frost-free period: 230 to 300 days

Composition

Fiddyment and similar soils: 85 percent
Minor components: 15 percent

Description of Fiddyment

Setting

Landform: Terraces
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from siltstone

Properties and Qualities

Slope: 1 to 8 percent
Depth to restrictive feature: 20 to 35 inches to Duripan; 28 to 35 inches to Duripan; 35 to 39 inches to Lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Very low (about 2.7 inches)

Interpretive Groups

Land capability classification (irrigated): 4e
Land capability (non irrigated): 4e

Typical Profile

0 to 12 inches: loam
12 to 28 inches: clay loam
28 to 35 inches: indurated
35 to 39 inches: weathered bedrock

Minor Components

Cometa soils
Percent of map unit: 5 percent

Kaseburg soils
Percent of map unit: 5 percent

San joaquin soils
Percent of map unit: 3 percent

Alamo soils
Percent of map unit: 2 percent
Landform: Depressions

Map Unit Description

Placer County, California, Western Part

194 Xerofluvents, frequently flooded

Setting

Elevation: 0 to 1500 feet
Mean annual precipitation: 14 to 20 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 250 to 270 days

Composition

Xerofluvents, frequently flooded, and similar soils: 90 percent
Minor components: 10 percent

Description of Xerofluvents, frequently flooded

Setting

Landform: Drainageways
Landform position (two-dimensional): Toeslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Properties and Qualities

Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.20 to 1.98 in/hr)
Depth to water table: About 30 to 57 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate maximum: 5 percent
Gypsum maximum: 0 percent
Available water capacity: Moderate (about 8.1 inches)

Interpretive Groups

Land capability classification (irrigated): 4w
Land capability (non irrigated): 4w

Typical Profile

0 to 15 inches: stratified loamy sand to fine sandy loam
15 to 37 inches: stratified loamy sand to fine sandy loam to silt loam
37 to 55 inches: stratified loam to silty clay loam to clay

Minor Components

Unnamed soils

Percent of map unit: 10 percent
Landform: Drainageways

Map Unit Description

Detailed Soil Map Units

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Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A "complex" consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

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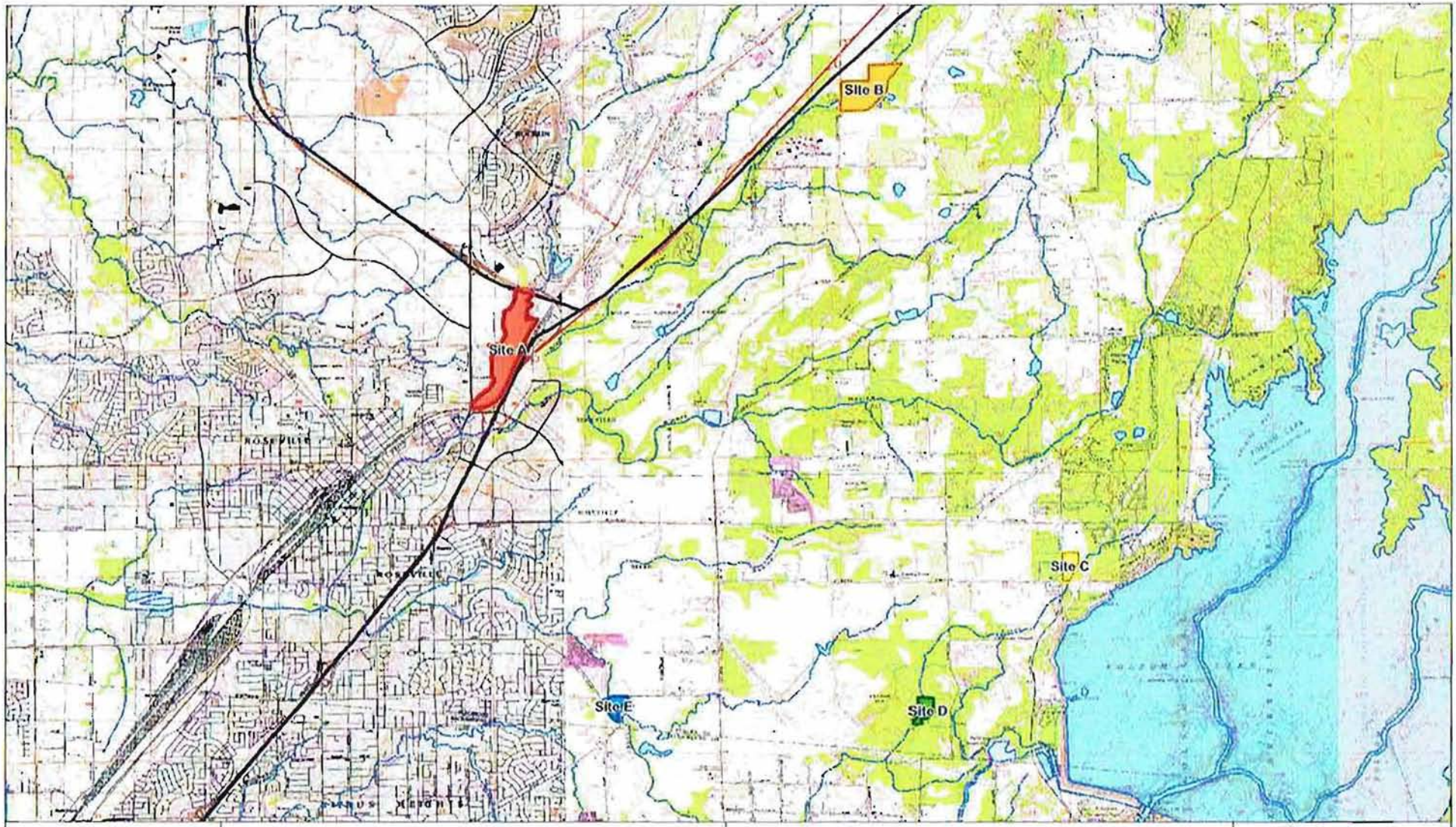

RESTORATION RESOURCES

Dry Creek Watershed
Site Location Map

Site Locations

Dry Creek Watershed
Placer County, CA
July 30, 2010