

*Appendices*

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*Appendix B Biological Resources*



# *Appendices*

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General Biological Resources Assessment  
Arrowhead Springs Specific Plan  
San Bernardino County, California

Prepared for:

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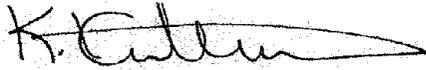
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Project Number: TPC04-101

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**CERTIFICATION**

I hereby certify that the statements furnished above and in the attached exhibits present data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.



\_\_\_\_\_  
Karen Kirtland  
Natural Resources Assessment, Inc.

12 July 05

\_\_\_\_\_  
Date

<b>Table of Contents</b>	<b>Page</b>
Executive Summary.....	S-1
1.0 Introduction.....	1
2.0 Site Location and Project Description.....	1
3.0 Methods.....	1
3.1 Data Review.....	1
3.2 Field Surveys.....	4
4.0 Results.....	4
4.1 Data Findings.....	4
4.2 Field Assessment.....	6
4.3 Sensitive Biological Resources.....	18
4.4 Raptors, Migratory Birds, and Habitat.....	20
4.5 Habitat Fragmentation and Wildlife Movement.....	20
4.6 Jurisdictional Drainages and Wetlands.....	21
5.0 Discussion.....	23
5.1 General Biological Impacts.....	24
5.2 Sensitive Biological Resources.....	25
5.3 Drainages and Wetlands.....	28
5.4 Mitigation Measures.....	29
5.5 Other Issues.....	32
6.0 References .....	34

**Figures**

1	Project Location.....	2
2	Proposed Land Use.....	3
3	Plant Communities.....	9
4	Potential Jurisdictional Waters.....	22

**Tables**

1	Acreage of Plant Communities Within the Property Boundaries.....	24
2	Impact Acreage to Plant Communities Within the Project Area.....	24

**Site Photographs**

1	Arrowhead Springs Hotel and Spa. Historic hotel.....	6
2	Metropolitan Water District operations site.....	6
3	Spreading basins south of the Arrowhead Springs Hotel and Spa facility.....	7
4	Partially improved residential development project.....	7
5	Disturbed and ruderal plant community.....	10
6	Mixed annual grassland and scrub. Steam Caves drainage.....	10
7	Deerweed scrub. North of East Twin Creek.....	11
8	Chamise chaparral. North side of the property, north of Lake Vonette.....	12
9	Sycamore alder riparian woodland. Confluence of East Twin and Strawberry Creek....	13
10	Sycamore willow woodland. Waterman Creek.....	13
11	Invasive palms along lower Waterman Creek.....	15
12	Lake Vonette.....	15
13	Hot spring vent.....	17
14	Steam cave buildings.....	17

**Appendices**

A	Flora and Fauna Compendia
B	Sensitive Resources Table

## **Executive Summary**

Natural Resources Assessment, Inc. (NRA, Inc.) conducted a biological resources assessment for the Arrowhead Springs Specific Plan. The property is located in the northern San Bernardino, at the base of the San Bernardino Mountains.

The project is a proposed specific plan. Projected development includes residential, commercial, business, and recreational land use. Included in the proposed design may be a realignment of State Route Highway 18.

The surveys were conducted by Ms. Karen Kirtland of NRA, Inc. and Mr. Michael Misenhelter on November 9 and 10, 2004. The survey combined walking and driving surveys of the property, focusing on areas proposed for development. The surveys included the use of binoculars to aid in the identification of birds, as well as plant species on inaccessible hillsides. All species identified by sight, call or sign (burrows, scat, tracks, etc.) were recorded. Site photographs were taken with a digital camera.

The purpose of the survey was to document the biological resources present onsite and to assess the potential for sensitive resources to occur on the property.

Information drawn from the California Natural Diversity Data Base (CNDDDB) includes listings of sensitive rare, threatened and endangered species that have been found in the vicinity of the project. In addition to species listed by the CNDDDB, NRA, Inc. reviewed other references and identified a number of sensitive plant and animal species that may be present in or near the site.

There are at least nine listed species known or potentially present on site. Seven of these are aquatic or river species, potentially present along the drainages. In addition, the riparian habitat and adjacent scrub habitat may be used by raptors and migratory birds as foraging and nesting habitat.

Potential wildlife corridors on the site occur within East Twin Creek, Waterman Canyon, Strawberry Creek, and their tributaries. Wildlife movement near the development area has been affected by residential development, roads, and highway construction. The potential for access to undeveloped lands is limited to north and east, and slightly constrained to the west.

The impacts of the specific plan can only be generally assessed, because the plan design is subject to change. However, since most of the proposed development will take place primarily in existing developed or disturbed areas, the majority of the impacts to native animals, plants, and their habitat will be in the perimeter of the project. The one major exception is the proposed golf course in Waterman Canyon.

The perimeter impacts mostly result from the proposed vineyards, intended to function as fuel modification zones. These vineyards, or zones, will extend into native habitat. The current design will impact mostly grassland and scrub habitats, depending upon the final width and length of the various zones.

Zones in the East Twin Creek and tributary areas may have additional impacts to riparian habitats, if they are extended down slope into the creek drainage. The potential impacts to listed species include the loss of individual Nevin's barberry and thread-leaved brodiaea plants, as well as habitat areas potentially occupied by riparian and aquatic species.

There are two bridges that are proposed to access the various parts of the development. Depending upon bridge design, there may be additional impacts to the drainages crossed by the bridges.

The golf course design appears to leave the central drainage of Waterman Creek relatively intact. However, the course will encroach substantially into the floodplain area of the creek. This impact is significant because of the wildlife value of the drainage. It is not known if any of the listed riparian species occur in this drainage, but if populations exist, the loss of habitat would be significant.

With the exception of impacts to Waterman Creek and parts of East Twin Creek, impacts to raptor and migratory bird foraging habitat and habitat fragmentation are not expected to be substantial, because the proposed development is confined mostly to existing disturbed areas.

The proposed golf course could substantially affect the use of the Waterman Canyon drainage by foraging raptors and migratory birds. Downstream at the confluence of East Twin Creek and Waterman Creek, existing open space with grassland habitat would be replaced with residential development, further reducing the available foraging habitat.

NRA, Inc. recommends that pre-construction surveys be conducted to determine if nesting migratory or raptor species are using riparian habitat and scrub areas. If nesting is taking place, mitigation from construction impacts may include setbacks or scheduling constraints.

Impacts to north-south wildlife movement will be substantial due to the loss of the Waterman Canyon floodplain to the golf course. Farther downstream, increased human presence along the banks of the canyon from residential development will also negatively affect north-south wildlife movement.

Impacts to east-west wildlife movement could also be substantial in the southern portion of the site due to proposed residential development of mostly open space.

NRA, Inc. recommends focused surveys be conducted for the following listed species to determine their presence or absence on site.

- Thread-leaved brodiaea
- Nevin's barberry
- Slender-horned spineflower
- Santa Ana River woolly star
- Santa Ana River sucker
- Arroyo toad
- California red-legged frog
- Mountain yellow-legged frog
- San Bernardino kangaroo rat

NRA, Inc. also recommends that surveys be conducted to evaluate the extent of sensitive species that may meet listing criteria, as well as sensitive habitats that may be lost as a result of project buildout.

For those species found along drainages, the assessment of impacts will need to evaluate both the direct loss of habitat (especially along Waterman Canyon) as well as indirect impacts such as altered water flows or contamination of drainages. These impacts should be addressed along with any mitigation required for impacts to the drainages themselves.

If listed plant species or sensitive species meeting listing criteria are found during the surveys, mitigation in the form of protection or habitat replacement will be required.

East Twin Creek, Strawberry Creek, Waterman Creek, and their tributaries meet the U. S. Corps of Engineers (Corps) definition of jurisdictional waters because of the presence of water flow and the continuous connection to the Santa Ana River through the East Twin flood control channel. The riparian woodlands within these drainages very likely would come under the jurisdiction of the Corps as wetland habitat.

East Twin Creek, Strawberry Creek, Waterman Canyon, and their tributaries would come under the California Department of Fish and Game (CDFG) jurisdiction due to the definable presence of bed and banks. The riparian woodlands would also come under the jurisdiction of the CDFG because of their value to wildlife and connection to a jurisdictional drainage. Additional drainages, such as an unnamed drainage along State Route 18, may also come under the jurisdiction of the CDFG.

There are artificial ponds on the property that may come under CDFG jurisdiction because of their potential value to wildlife.

All drainages that leave the property would come under the jurisdiction of the Regional Water Quality Control Board, which is concerned with waters of the State.

Any proposed alteration of drainages, including drawing water for irrigation use, will require consultation with the California Department of Fish and Game regarding 1602 requirements, the U. S. Army Corps of Engineers regarding 404 permit requirements, and the Regional Water Quality Control Board regarding 401 permit requirements.

NRA, Inc. recommends that a formal wetland delineation and jurisdictional drainage determination be conducted to determine the extent of impacts resulting from the proposed golf course, fuel modification zones and any other proposed development. The appropriate 404 Permit, 1602 Streambed Agreement and 401 Certification will have to be obtained for Waterman Canyon, and may be required for the other drainages if they are impacted by project construction. If streambeds will be impacted, mitigation may be required and will have to be developed in accordance with the various agency approvals.

As a best management practice measure, NRA, Inc. recommends that landscape palettes be specified to prohibit the use of invasive or non-native plants, to minimize the degradation of native habitats. The California Invasive Plant Council ([www.caleppc.org](http://www.caleppc.org)) provide substantial information on weed pests, along with recommendations regarding the use of non-native plants in landscaping.

## **1.0 Introduction**

Natural Resources Assessment, Inc. (NRA, Inc.) conducted a biological resources assessment for the Arrowhead Springs Specific Plan. The purpose of the survey was to document the biological resources present onsite and to assess the potential for sensitive resources to occur on the property.

## **2.0 Site Location and Project Description**

The proposed project is in the lower foothills of the San Bernardino Mountains, north of the city of San Bernardino. The project alignment extends from the city limits north up Waterman Canyon. From Waterman Canyon it extends east and includes the junction of Waterman Creek (also known as West Twin Creek) and East Twin Creek, as well as the lower drainage of Strawberry Creek (Figure 1).

The property extends from a small area in Section 3 south through Sections 2, 11, 12 and 14, Township 2 north, Range 5 west. It also extends east into Sections 12 and 17, Township 2 north, Range 4 west. A very small piece extends north into Section 34, Township 3 north, Range 5 west, San Bernardino base and meridian (Figure 1).

The property totals 1,916 acres. Of this total, 505.8 acres are proposed for development under the current design, 10.2 acres are owned by the Metropolitan Water District, and the remaining 1400 acres will remain in open space. The proposed development is a mix of residential, commercial, and recreational development. Proposed projects include residential housing, commercial areas, a hotel, spa, health club, pool, restaurant, and an eighteen hole golf course. Several vineyard plantings are proposed for the fuel modification zones around the development area (Figure 2).

## **3.0 Methods**

### **3.1 Data Review**

A data review was conducted to provide information on plant and wildlife species known occurrences within the vicinity. This review included biological texts on general and specific biological resources, including those resources considered to be sensitive by various wildlife agencies, local governmental agencies and interest groups.

- List of sensitive biological resources provided by the California Natural Diversity Data Base
- Biological resources report for this site and adjacent properties
- General texts and other documents identifying potential resources on the property

NRA, Inc. also reviewed other available technical information on the biological resources of the site as well as our own experience with habitats and species of this area of San Bernardino County. We used the information to focus our survey efforts in the field.

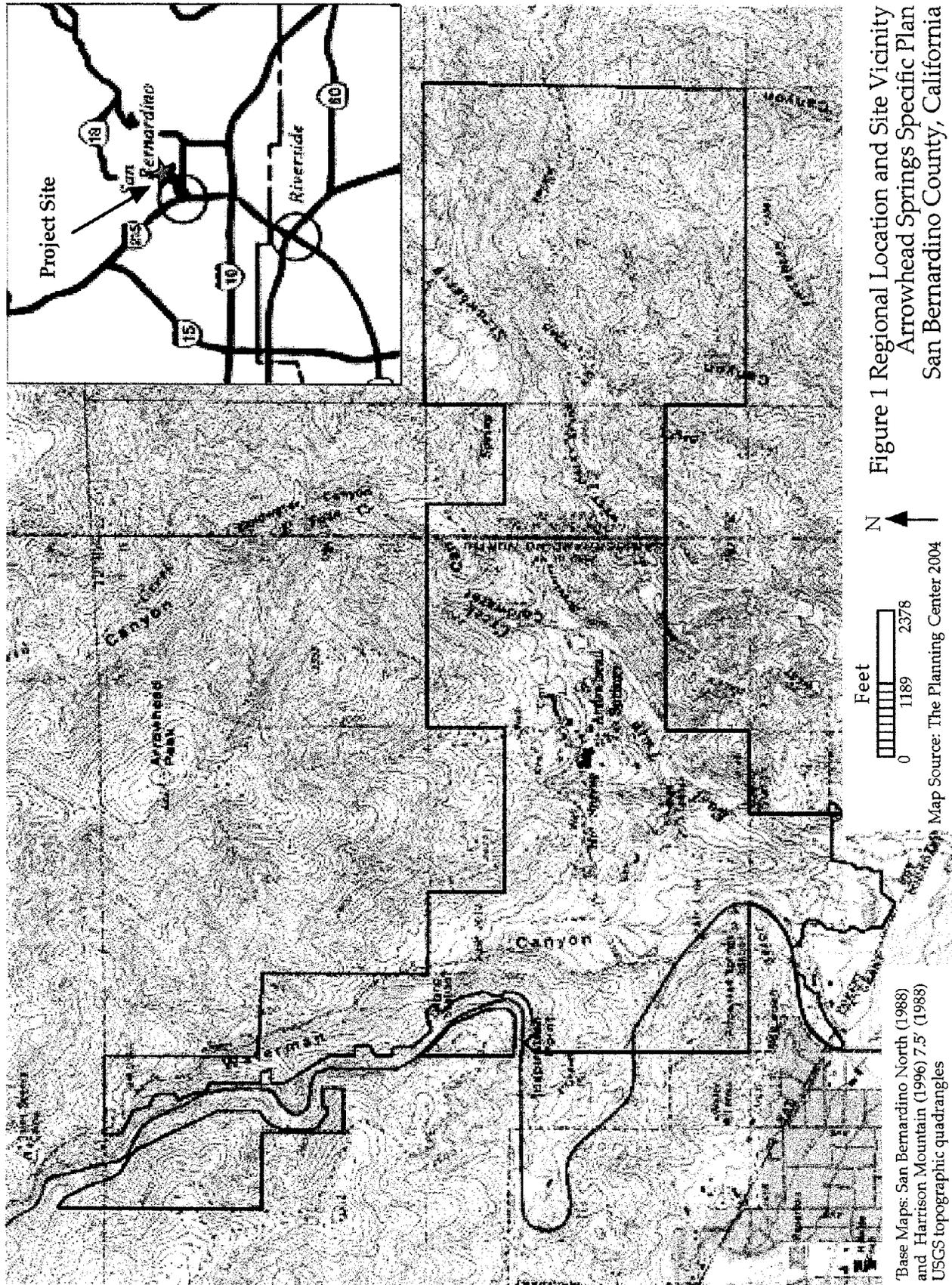


Figure 1 Regional Location and Site Vicinity  
 Arrowhead Springs Specific Plan  
 San Bernardino County, California

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 Map Source: The Planning Center 2004

Base Maps: San Bernardino North (1988)  
 and Harrison Mountain (1996) 7.5' (1988)  
 USGS topographic quadrangles

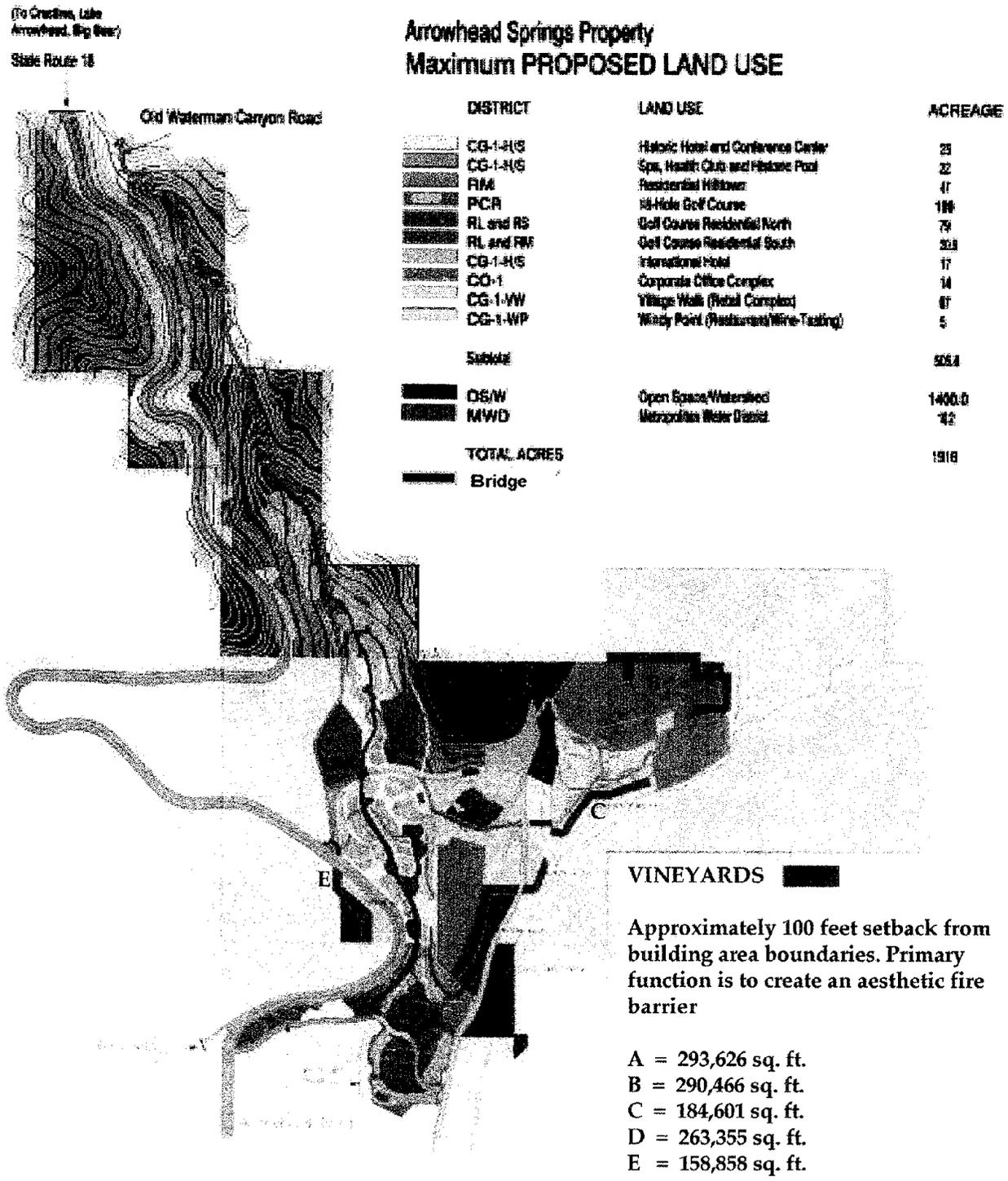
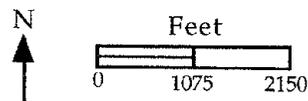


Figure 2 Proposed Land Use



Source: The Planning Center 2004

Arrowhead Springs Specific Plan  
 San Bernardino County, California

Sensitive species potentially present include those listed, or candidates for listing by the U. S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG) and California Native Plant Society (CNPS).

All sensitive species were considered as potentially present on the project site if its known geographical distribution encompassed all or part of the project area or if its distribution was near the site and its general habitat requirements were present.

### **3.2 Field Surveys**

The surveys were conducted by Ms. Karen Kirtland and Mr. Michael Misenhelter on November 9 and 10, 2004. The survey combined walking and driving surveys of the project site, and included the use of binoculars to aid in the identification of resources. All species identified by sight, call or sign (burrows, scat, tracks, etc.) were recorded. Site photographs were taken with a digital camera.

The existing conditions within the site were recorded, paying specific attention to habitats that may potentially contain sensitive species. The field surveys were focused on sensitive biological resources, and included observations of potential habitat for sensitive species. Sign surveyed for included nests, tracks, scat, burrows, skeletal remains, and live animals. During the surveys, notes were made on the plant and animal species observed, the surface characteristics and topography of the project area, and the suitability of the habitat for the sensitive species.

## **4.0 Results**

### **4.1 Data Results**

Appendix A contains a list of the plant and animal species observed during the field surveys. Appendix B contains a table of the sensitive resources identified for the project area, their habitat requirements, seasonal distribution, legal standing and the potential for their presence or absence on site.

### **4.2 Field Assessment**

#### **4.2.1 Weather**

Weather conditions on November 9 included cloudy skies, temperatures in the low sixties degrees Fahrenheit and winds at less than two miles per hour from the south. The skies became partly clear by the end of the survey, temperatures in the mid sixties, and winds reached two to five miles per hour from the west.

On November 10, the skies were clear, with temperatures in the high sixties with no wind. By the end of the survey, the temperatures had reached the low seventies, with clear skies and a mild wind less than two miles per hour from the south.

#### **4.2.2 Topography and Soils**

The property is generally in the foothill area of the San Bernardino Mountains. The terrain is a mix of large to small drainages, rolling hillsides and steep slopes. Most of the development is mostly on the gentle slopes of the lower foothill area. Several of the vineyard/fuel modification zones are the steeper hillsides, especially in the East Twin Creek drainage. The golf course is proposed along Waterman Canyon, which is a relatively broad, flat canyon.

The soils on the property include Soboba stony loamy sandy soils in the drainages and a mix of Soboba stony loamy sandy soils and Hanford coarse sandy loams on the hillsides.

#### **4.2.3 Land Uses**

The former land use included a spa, hotel, and recreational center (Photo 1). Bungalows formed the majority of the residential units. Currently, use of the property is limited to the site office buildings, a village complex and conference room. Maintenance buildings and various support buildings form most of the remaining structures.

Roads are limited, with the main road crossing west to east from Old Waterman Canyon Road. Most of the minor roads provide access to the site facilities, basins, existing powerlines and underground pipelines, and do not connect to public roads.

The Metropolitan Water District (MWD) is currently completing their Tunnel Project for water conveyance to southern Riverside and San Diego Counties. Their activities are confined to a moderately small area along Waterman Canyon near the main entrance to the property (Photo 2).

The land uses on the south include percolation and spreading basins for the water from East Twin Creek and Waterman Creek, as well as the residential areas of northern San Bernardino (Photo 3). Streets and other infrastructure was development for a a proposed (now abandoned) residential development in the southern section of the property (Photo 4). Open space occurs on the east, west and north.

#### **4.2.4 Disturbances**

Disturbances onsite mostly occurred in the past during the construction and use of the Arrowhead Springs Hotel and and Spa. Current disturbances include the loss of scrub on the south, east and west from wildfires, and the grading and drilling being conducted by MWD in Waterman Canyon.

#### **4.2.5 Plant Communities**

The site contains a number of plant communities. The classification of native plant communities is based mostly on Munz (1974). Non-native plant communities are classified according to human activity or use of the site. Disturbed, ruderal, and landscaped plant communities occupy most of the grounds of the Arrowhead Springs Hotel and Spa and the vacant residential development on the south.



Photo 1. Arrowhead Springs Hotel and Spa. Historic hotel.



Photo 2. Metropolitan Water District operations site.



Photo 3. Spreading basins south of the Arrowhead Springs Hotel and Spa facility.



Photo 4. Partially improved residential development project.

Mixed annual grasslands and scrub, chamise chaparral, chaparral, woody riparian, and lower montane coniferous forest are found mostly in the open spaces of the property (Figure 3). Riparian woodlands occur along East Twin Creek, Strawberry Creek, Waterman Creek, their tributaries, and an unnamed drainage along State Route 18.

#### 4.2.5.1 Disturbed and Ruderal

Plant species within this community consists of weedy grasses such as red brome (*Bromus madritensis*) and Mediterranean grass (*Schismus barbatus*), and weedy forbs such as short-podded mustard (*Hirschfeldia incana*), Russian thistle (*Salsola tragus*) and tocalote (*Centaurea melitensis*). Native plant species include doveweed (*Eremocarpus setigerus*), telegraph weed (*Heterotheca grandiflora*), and twiggy wreath plant (*Stephanomeria virgata*). Plant cover is very sparse (Photo 5).

#### 4.2.5.2 Mixed Annual Grassland and Scrub

Most of the lower slopes of the foothills are covered with a mix of annual grassland and scrub (Photo 6). The dominant annual species include various brome grasses (*Bromus madritensis*, *Bromus diandrus*, and *Bromus tectorum*), Mediterranean grass, and herbaceous species such as short-podded mustard and doveweed.

The dominant scrub species in this plant community is California buckwheat (*Eriogonum fasciculatum*), and deerweed (*Lotus scoparius*). Herbaceous species include short-podded mustard, branching phacelia (*Phacelia ramosissima*) and cotton thorn (*Tetradymia comosa*). In some areas (especially those subject to frequent burning), this community is dominated by grasses and deerweed.

This plant community frequently intergrades with chamise chaparral.

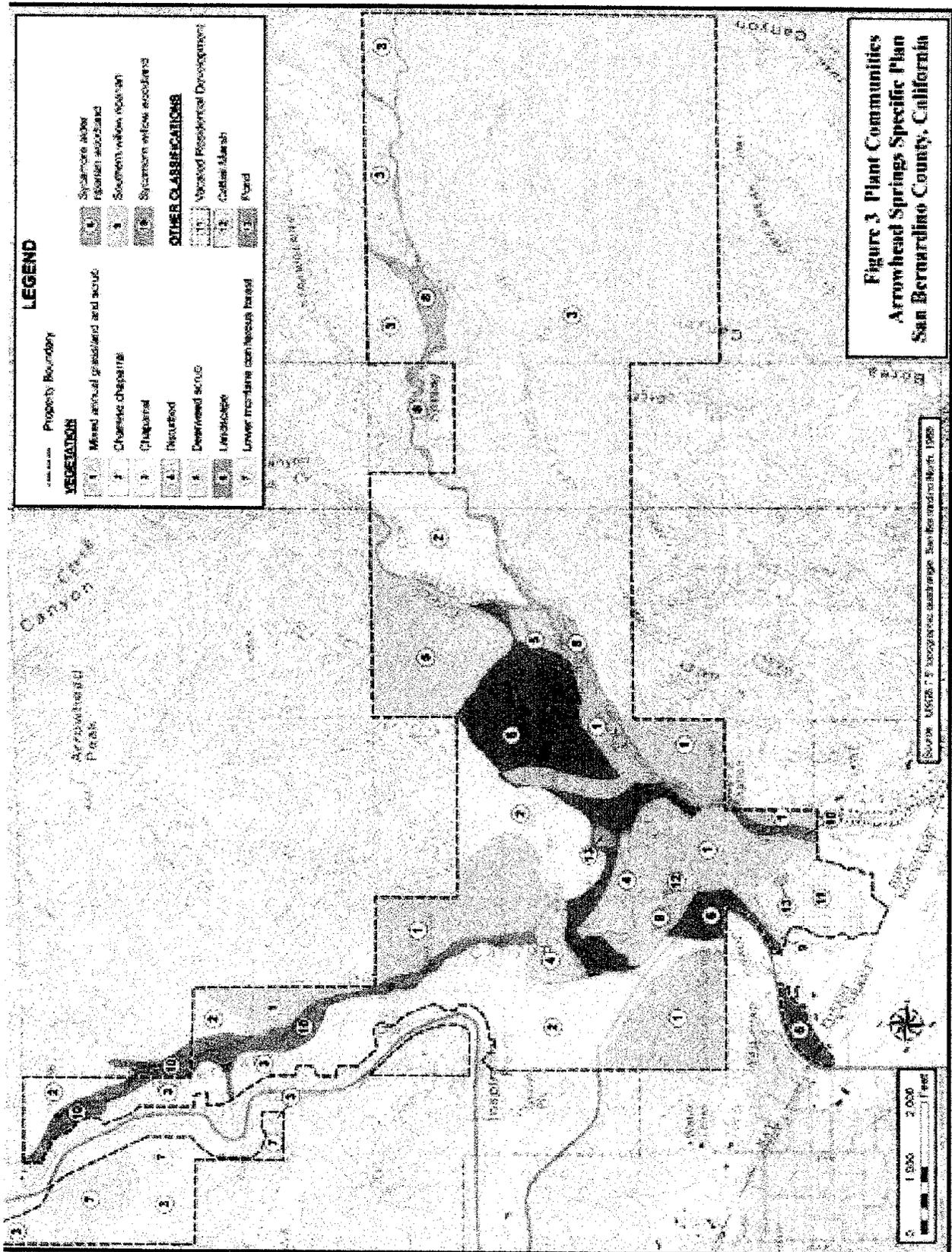
#### 4.2.5.3 Deerweed Scrub

This plant community is dominated by deerweed, weedy grasses and herbs (Photo 7). Almost no other scrub plant occurs in this community. It is found only in the central area north of the landscaped area of the Arrowhead Springs Hotel and Spa.

Deerweed scrub is not a true native southern California plant community. Instead, it indicates that the native scrub habitat has been recently disturbed (usually burned), with the result that deerweed becomes the dominant shrub.

#### 4.2.5.4 Chamise Chaparral

The chamise chaparral on site is dominated by chamise (*Adenostoma fasciculatum*), but includes some coastal sage scrub species such as California buckwheat, deer weed and white sage (*Salvia apiana*). Other species found in chamise chaparral include buckbrush (*Ceanothus cuneatus*), yerba santa (*Eriodictyon trichocalyx*), Whipple's yucca (*Yucca whipplei*) and black sage (*Salvia mellifera*). Scrub oak (*Quercus berberidifolia*) is also sometimes found in this plant community.



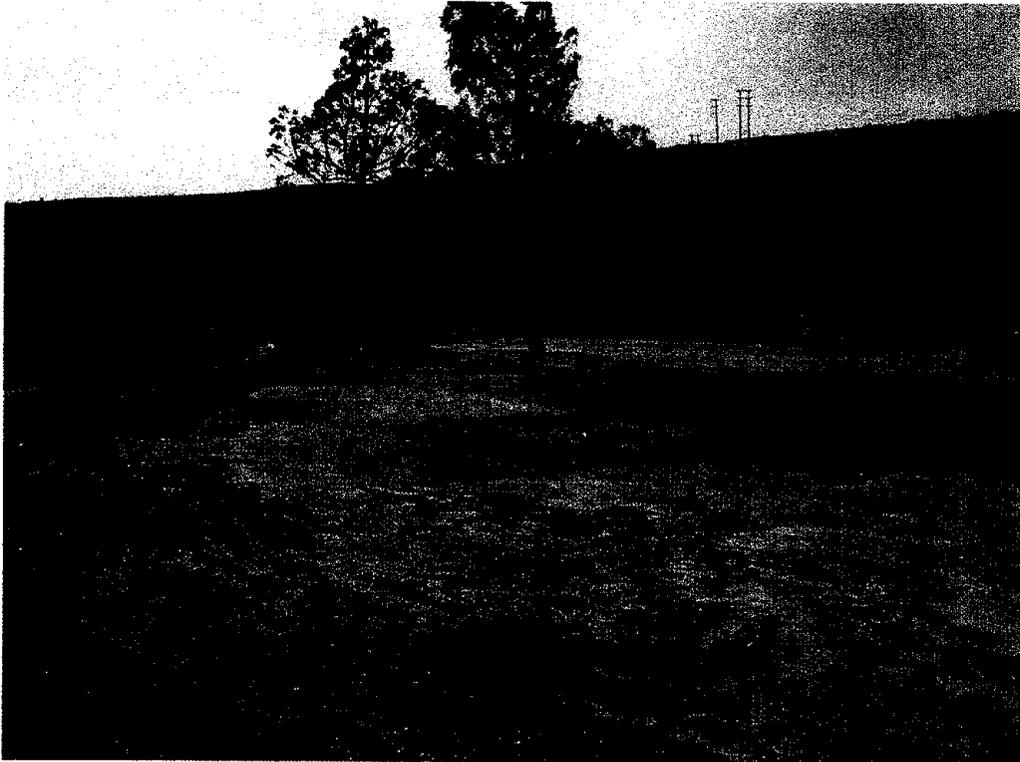


Photo 5. Disturbed and ruderal plant community.  
A graded pad on the north bank of East Twin Creek.



Photo 6. Mixed annual grassland and scrub. Steam Caves drainage.

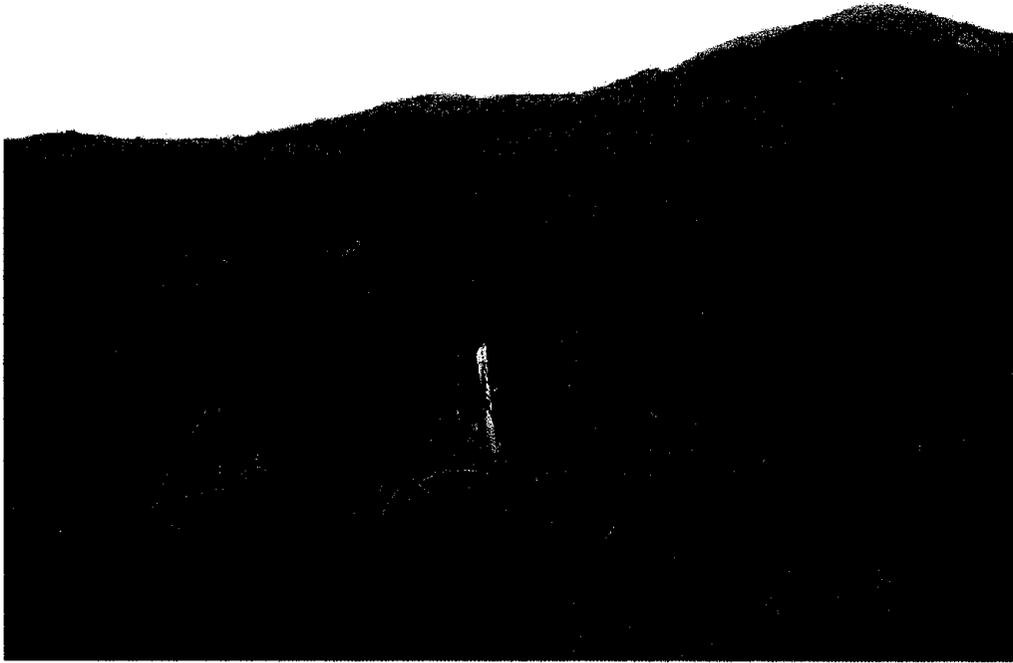


Photo 7. Deerweed scrub. North of East Twin Creek.

Herbaceous species include wishbone bush (*Mirabilis californica*) and wild cucumber (*Marah macrocarpa*) on dry slopes. Poison oak (*Toxicodendron diversilobum*) occurs in more moist sites.

On the Arrowhead Springs property, chamise chaparral is found on dry slopes, often intermixed with the mixed annual grassland and scrub plant community (Photo 8). Chamise chaparral also occurs along upper Waterman Canyon, and is particularly extensive along the western side of the canyon.

#### **4.2.5.5 Chaparral**

Chaparral is found mainly on upper slopes and at higher elevations in the mountain ranges. Common species include hoaryleaf ceanothus (*Ceanothus crassifolius*), mountain mahogany (*Cercocarpus betuloides*), and coast live oak (*Quercus chrysolepis*).

Within the project area, chaparral stands are scattered on upper mountainsides, particularly along the upper East Twin and Strawberry Creek canyon area, and in the upper reaches of Waterman Canyon.

#### **4.2.5.6 Riparian Woodlands**

Riparian woodlands are found along East Twin Creek, Strawberry Creek, Waterman Creek and the unnamed drainage along State Route 18. Cover and plant species are similar for East Twin Creek and Strawberry Creek, and different for Waterman Creek and the unnamed drainage.



Photo 8. Chamise chaparral. North side of the property, north of Lake Vonette.

East Twin Creek and Strawberry Creek support stands of sycamore alder riparian woodland species, especially black willow (*Salix gooddingii*), sycamore (*Platanus racemosa*), and California walnut (*Juglans californica*). Alder (*Alnus rhombifolia*) also occurs in these canyons (Photo 9). What appears to be cultivated fig (*Ficus carica*) was also found. Further downstream, near the junction with Waterman Creek, alders disappear and the stand becomes a sycamore willow woodland. Southern mixed riparian forest was not found during our surveys.

The understory in East Twin Canyon is mostly made up of herbaceous species such as red monkeyflower (*Mimulus cardinalis*), California mugwort (*Artemisia douglasiana*), white-flowered deadly nightshade (*Solanum douglasiana*), and poison oak (*Toxicodendron diversilobum*). Shrubs along the canyon sides include mountain mahogany, California brickellia (*Brickellia californica*), and hoaryleaf ceanothus.

Riparian woodland in Waterman Canyon ranges from open to moderately dense cover (Photo 10). Tree species include red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), sycamore, and California walnut. California bay (*Umbellularia californica*) and coast live oak trees are occasionally found on the upper hillsides of the Waterman Canyon.

The understory in Waterman Canyon is limited, formed mostly by herbaceous species such as croton (*Croton californica*), poison oak, and non-native grasses.



Photo 9. Sycamore alder riparian woodland.  
Confluence of East Twin and Strawberry Creeks.

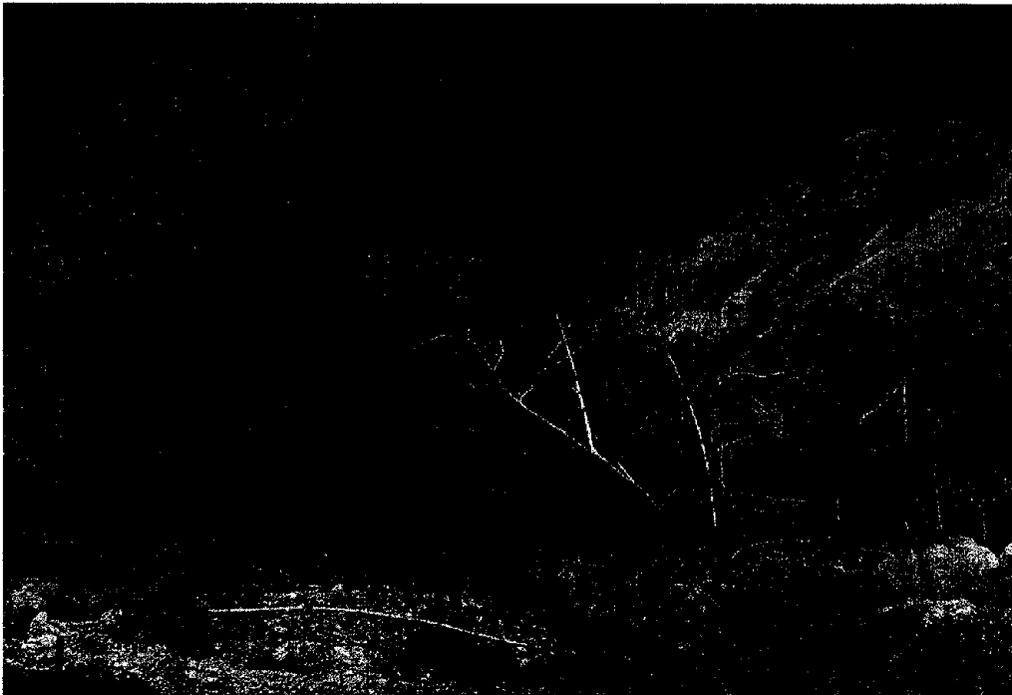


Photo 10. Sycamore willow woodland. Waterman Creek.

The unnamed drainage is dominated by sycamore and red willow, with at least one tamarisk (*Tamarix* sp.). The herbaceous understory is dominated by non-native grasses and a dense stand of short-seeded ryegrass (*Leymus condensatus*).

#### 4.2.5.7 Lower Montane Coniferous Forest

Lower montane coniferous forest is dominated by Coulter pine (*Pinus coulteri*), manzanita (*Arctostaphylos* sp.), coast live oak, and occasional stands of scrub oak. Understory in unburned stands is relatively nonexistent, consisting mostly of grasses (*Bromus* spp.).

This plant community is confined to the upper reaches of Waterman Canyon, on the western slopes of the canyon.

#### 4.2.5.8 Non-native Landscaping

Non-native landscaping is mostly found in the non-native areas of the property, around buildings and development areas. Plant species in this community include five species of palms (species unknown), eucalyptus species (*Eucalyptus* spp.), Peruvian pepper tree (*Schinus molle*), apricots, non-native oak (*Quercus* spp.), and pines (*Pinus* spp.) citrus trees (lemon, orange, apple, peach, grapefruit), apricot, and olive other landscape trees and shrubs. Most of the individual plants found on site are plantings on the former Arrowhead Springs Hotel and Spa (Photo 1). Some species have invaded the native habitats around the grounds (Photo 11).

The vacated partially improved residential area in the southern section of the Specific Plan is apparently occupied by non-native grasses and plantings of non-native trees such as pines and eucalyptus. The pines may be Torrey pines, because it appears the development proposed for this area may once have been called Torrey Pines. The field team was unable to access the area and properly evaluate the site.

On the grounds of the former Arrowhead Springs Hotel and Spa are at least two artificial ponds. Both were filled with water at the time of the survey.

The first one is in the extreme southern part of the property. No native vegetation exists within the pond, which is surrounded by mixed annual grassland and buckwheat scrub.

The second pond is Lake Vonette, along the main access road into the facility (Photo 12). This water is surrounded by plantings of Scotch broom (*Spartium junceum*), pampas grass (*Cortaderia selloana*) and a ring of palm trees.

Just downstream of the second pond is a low area, made even lower by grading. At the time of the survey, this area supported a dense stand of cattail (*Typha latifolia*) and weedy grasses. It appears this area receives sufficient water to maintain this (apparently) artificial herbaceous wetland.



Photo 11. Invasive palms along lower Waterman Creek.



Photo 12. Lake Vonette.

#### 4.2.5.9 Hot Springs

The Arrowhead Springs Specific Plan includes natural hot springs, such as the steam cave area (Photo 13). Natural hot springs normally provide specialized environments for wildlife and plant species; however, the springs on the property have been altered from their native state as part of the spa facility (Photo 14). As a result, the only drainage with a semi-natural habitat is the Steam Caves drainage. This drainage is known to support thread-leaved brodiaea (*Brodiaea filifolia*), and may support other sensitive plant species.

#### 4.2.6. Wildlife

This section provides a discussion of those wildlife species observed or expected to occur onsite. A list of wildlife species observed during the survey is included in Appendix A.

##### 4.2.6.1 Invertebrates

Insect activity was expected to be low because the survey was not conducted during the peak flight season for most insect species. Non sensitive insect species observed during the survey include cabbage butterfly (*Artogeia rapae*), honeybee (*Apis mellifera*) and darkling beetle (*Eleodes* sp.).

##### 4.2.6.2 Amphibians

The alignment has limited potential to support some amphibian species along the drainages and in moister areas, however, no amphibian species were observed during the surveys. Amphibian species expected to occur include California tree frog (*Hyla regilla*) and western toad (*Bufo boreas*).

##### 4.2.6.3 Reptiles

The property has several habitats used by reptiles and has the potential to support a wide variety of species, however, only two reptile species was observed during the survey, side-blotched lizard (*Uta stansburiana*) and western fence lizard (*Sceloporus occidentalis*).

##### 4.2.6.4 Birds

The habitats on the property provide foraging, cover, and nesting habitat for year-round residents, seasonal residents, migrating songbirds, and some waterbirds. More common birds seen in open areas include house finch (*Carpodacus neomexicanus*), common raven (*Corvus corax*) and northern mockingbird (*Mimus polyglottos*).

Species observed in annual grassland and scrub habitats include blue-gray gnatcatcher (*Poliophtila caerulea*), white-crowned sparrow (*Zonotrichia leucophrys*), California towhee (*Pipilo crissalis*) and western scrub jay (*Aphelocoma californica*).

In the riparian woodland habitat, Nuttall's woodpecker (*Picoides nuttallii*), ruby-crowned kinglet (*Regulus calendula*), and yellow-rumped warbler (*Dendroica coronata*) were either seen or heard.



Photo 13. Hot spring vent.



Photo 14. Steam cave buildings. Note steam escaping from underground.

Steller's jay (*Cyanocitta stelleri*) was observed in the lower montane conifer forest, along with California towhee and western scrub jay.

Seen in flight was great egret (*Ardea alba*), northern harrier (*Circus cyaneus*), red-shouldered hawk (*Buteo lineatus*), and red-tailed hawk (*Buteo jamaicensis*).

#### 4.2.6.5 Mammals

The habitats on the property is anticipated to support a variety of mammals. However, most mammal species are nocturnal and were difficult to observe during the diurnal field surveys. Sign of mammals included burrows belonging to Botta's gopher (*Thomomys bottae*), Beechey ground squirrel (*Spermophilus beecheyi*) and kangaroo rat (*Dipodomys* sp.). Scat belonging to coyote (*Canis latrans*) was also observed.

### 4.3 Sensitive Biological Resources

Appendix B contains a table of the sensitive resources identified for the project area, their habitat requirements, seasonal distribution, legal standing and the potential for their presence or absence on site. Following is a brief summary of the more detailed information provided in the table.

#### 4.3.1 Plants

The grasslands and scrub plant communities may contain the following species:

- Nevin's barberry (*Berberis nevinii*)
- Plummer's mariposa lily (*Calochortus plummerae*)
- Intermediate mariposa lily (*Calochortus weedii* var. *intermedius*)
- Parry's spineflower (*Chorizanthe parryi* var. *parryi*)
- Long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*)
- Summer holly (*Comarostaphylis diversifolia* ssp. *diversifolia*)
- Many-stemmed dudleya (*Dudleya multicaulis*)
- Robinson's pepper-grass (*Lepidium virginicum* ssp. *robinsonii*)
- Parish's desert-thorn (*Lycium parishii*)
- Hall's monardella (*Monardella macrantha* ssp. *hallii*)

The drainages and moist areas (especially around the Arrowhead Springs Hotel and Spa area) may support the following species:

- Thread-leaved brodiaea (*Brodiaea filifolia*)
- Orcutt's brodiaea (*Brodiaea orcutti*)
- Palmer's mariposa lily (*Calochortus palmeri* var. *palmeri*)
- Bristly sedge (*Carex comosa*)
- Smooth tarplant (*Centromadia pungens* ssp. *laevis*)
- San Bernardino Mountains monkeyflower (*Mimulus exiguus*)
- California muhly (*Muhlenbergia californica*)

- Parish's gooseberry (*Ribes divaricatum* var. *parishii*)
- Gambel's water cress (*Rorippa gambelii*)
- Sonoran maiden fern (*Thelypteris puberula* var. *sonorensis*)

#### 4.3.2 Wildlife

The drainages and surrounding upland habitat may provide suitable breeding areas for the western spadefoot (*Spea hammondi*), arroyo toad (*Bufo californicus*), California red-legged frog (*Rana aurora draytoni*), mountain yellow-legged frog (*Rana muscosa*) and southwestern pond turtle (*Clemmys marmorata pallida*), speckled dace (*Rhinichthys osculus*), and Santa Ana River sucker (*Catostomus santaanae*).

Potential breeding and foraging habitat for the western spadefoot, arroyo toad, California red-legged frog, southwestern pond turtle and two-striped garter snake (*Thamnophis hammondi*) is also provided by the one or both of the artificial ponds on the grounds of the Arrowhead Springs Hotel and Spa.

The mixed grassland-scrub and chamise chaparral habitat provide suitable habitat with varying quality for the following species:

- San Gabriel slender salamander (*Batrachoseps gabrieli*)
- Coronado skink (*Eumeces skiltonianus interparietalis*)
- San Diego horned lizard (*Phrynosoma coronatum blainvillei*)
- Orange-throated whiptail (*Cnemidophorus hyperythrus*)
- Coastal western whiptail (*Cnemidophorus tigris multiscutatus*)
- Rosy boa (*Lichanura trivirgata*)
- Two-striped garter snake (*Thamnophis hammondi*)
- Northern red-diamond rattlesnake (*Crotalus exsul*)
- Northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*)
- San Diego desert woodrat (*Neotoma lepida intermedia*)
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)
- Grasshopper mouse (*Onychomys torridus ramona*)

The white-tailed kite (*Elanus leucurus*) and loggerhead shrike (*Lanius ludovicianus*), may use both the drainages and scrub habitat as foraging habitat.

The riparian woodlands and drainages may provide foraging, roosting and possibly nesting habitat for the sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*Accipiter cooperi*) and black swift (*Cypseloides niger*).

All of the habitats may provide foraging for the golden eagle (*Aquila chrysaetos*) and prairie falcon (*Falco mexicanus*).

Riparian woodlands are considered to be sensitive habitats by the CDFG.

#### **4.4 Raptors, Migratory Birds and Habitat**

Most of the raptor species (eagles, hawks, falcons and owls) are experiencing population declines as a result of habitat loss. Some, such as the peregrine falcon, have also experienced population losses as a result of environmental toxins affecting reproductive success, animals destroyed as pests or collected for falconry, and other direct impacts on individuals. Only a few species, such as the red-tailed hawk and barn owl, have expanded their range in spite of or a result of human modifications to the environment. As a group, raptors are of concern to state and federal agencies.

In addition, raptors and all migratory bird species, whether listed or not, also receive protection under the Migratory Bird Treaty Act (MBTA) of 1918. The MBTA prohibits individuals to kill, take, possess or sell any migratory bird, bird parts (including nests and eggs) except in accordance with regulations prescribed by the Secretary of the Interior Department (16 U. S. Code 703).

Protection is provided to all bald and golden eagles under the Bald and Golden Eagle Protection Act of 1940, as amended. State protection is extended to all birds of prey by the CDFG Code, Section 2503.5. No take is allowed under these provision except through the approval of the agencies or their designated representatives.

The riparian woodland habitat along East Twin Creek, Strawberry Creek, and portions of Waterman Creek may provide potential nesting and roosting habitats for raptors and migratory bird species. Suitable scrub habitat adjacent to the drainages may also provide roosting areas for raptors and migratory bird species, as well as nesting habitat for some migratory species.

The riparian woodland along the unnamed drainage along State Route 18 is probably not dense enough to provide suitable nesting habitat for raptors and migratory bird species, although it may be sufficiently dense to provide roosting habitat.

The landscaping contains pine and large oak trees that may provide suitable roosting and nesting habitat for a variety of raptor and migratory bird species.

The grassland and scrub habitats may provide foraging habitat for raptor and migratory species.

#### **4.5 Habitat Fragmentation and Wildlife Movement**

Wildlife movement and the fragmentation of wildlife habitat have come to be recognized as important wildlife issues that must be considered in assessing impacts to wildlife. In summary, habitat fragmentation is the division or breaking up of larger habitat areas into smaller areas that may or may not be capable of independently sustaining wildlife and plant populations. Wildlife movement (more properly recognized as species movement) is the temporal movement of species along various types of corridors. Wildlife corridors are especially important for connecting fragmented wildlife habitat areas.

Major wildlife corridors on the property probably existed along Waterman Canyon and East Twin Creek, prior to the residential development of northern San Bernardino and the construction of flood

control basins downstream from the confluence of Waterman Creek and East Twin Creek. Although wildlife movement very likely still occurs up and down Waterman Canyon and East Twin Creek, the abrupt termination of these drainages in the flood control basins, and the presence of the Arrowhead Springs Hotel and Spa has somewhat constrained north-south wildlife movement along drainages and mountain slopes down to the valley bottom.

North-south movement probably still occurs north up into the San Bernardino Mountains by way of the drainages and mountain slopes. Water is a limited resource in southern California, and the presence of pools and drainages attracts numerous wildlife species for foraging and nesting.

Any movement along east-west corridors is probably still occurring up East Twin Creek and Strawberry Creek, although it may be somewhat affected by the presence of the Arrowhead Springs Hotel and Spa and State Route 18 to the west.

Habitat loss has already occurred in the main portion of the property. The undeveloped open space area around the existing hotel grounds is a large contiguous, somewhat natural habitat that ultimately connects with the chaparral and conifer habitats of the San Bernardino Mountains.

#### **4.6 Jurisdictional Drainages and Wetlands**

East Twin Creek, Strawberry Creek, Waterman Creek, their tributaries and some additional drainages occur on the property (Figure 4). The various riparian habitats along some of these drainages may also be wetlands, depending upon soils, hydrology, and plant species present.

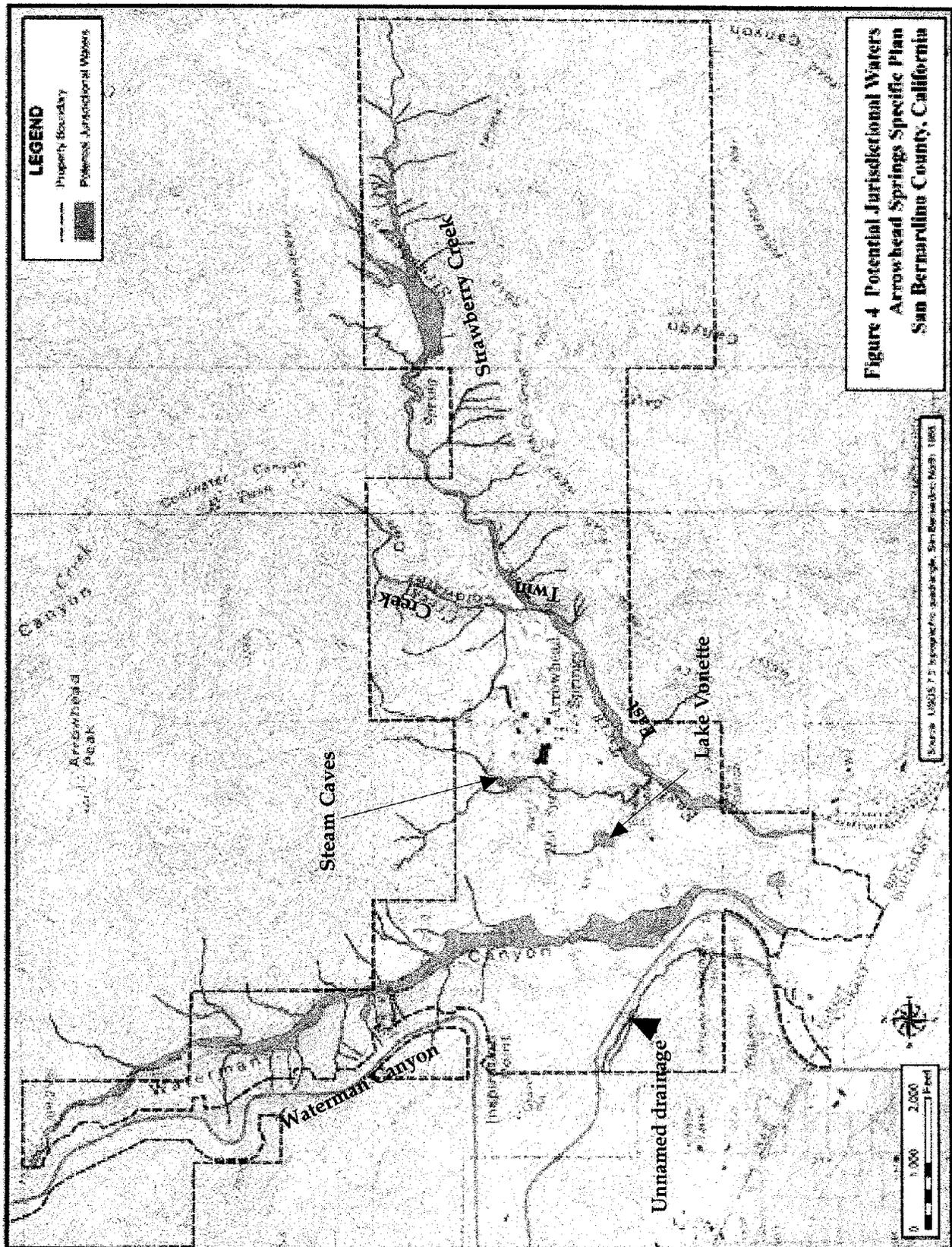
##### **4.6.1 U. S. Army Corps of Engineers**

The U. S. Army Corps of Engineers (Corps) regulates discharges of dredged or fill material into waters of the United States. Corps regulatory jurisdiction pursuant to Section 404 of the Clean Water Act is founded on a connection or nexus between the water body in question and interstate commerce. This connection may be direct, through a tributary system linking a stream channel with traditional navigable waters used in interstate or foreign commerce, or may be indirect, through a nexus identified in the Corps regulations.

These watershed include wetlands and non-wetland bodies of water that meet specific criteria. The lateral limit of Corps jurisdiction extends to the Ordinary High Water Mark (OHWM) and to any wetland areas extending beyond the OHWM; thus, the maximum jurisdictional area is represented by the OHWM or wetland limit, whichever is greater.

As with any federal action, the Corps will also have to consult with the U.S. Fish and Wildlife Service under Section 7 of the Federal Endangered Species Act (FESA) as part of the approval process for the 404 application.

East Twin Creek, Strawberry Creek, Waterman Creek, and their tributaries meet the U. S. Corps of Engineers (Corps) definition of jurisdictional waters because of the presence of water flow and a continuous connection to the Santa Ana River through the East Twin flood control channel. The riparian



woodlands within these drainages very likely would come under the jurisdiction of the Corps as wetland habitat.

The unnamed drainage along State Route 18 probably does not come under the jurisdiction of the Corps because it lacks a connection to a jurisdictional drainage. Flow from the drainage apparently terminates in a spreading basin area just south of State Route 18. The field team was unable to trace a connection from the spreading basin downstream to the Santa Ana River.

#### **4.6.2. California Department of Fish and Game**

The California Department of Fish and Game (CDFG) regulates any alteration of streambeds or lakes through their Code 1600 et seq. program. Any channel area displaying bed and banks falls within CDFG's jurisdiction. Lateral limits of jurisdiction are not clearly defined, but generally include any riparian resources associated with a stream or lake.

East Twin Creek, Strawberry Creek, Waterman Canyon, and their tributaries would come under the California Department of Fish and Game (CDFG) jurisdiction due to the definable presence of bed and banks. The riparian woodlands would also come under the jurisdiction of the CDFG because of their value to wildlife and connection to a jurisdictional drainage. Additional drainages, such as the unnamed drainage along State Route 18, may also come under the jurisdiction of the CDFG.

The artificial ponds may come under CDFG jurisdiction because of their potential value to wildlife.

#### **4.6.3 Regional Water Quality Control Board**

While the Corps retains the authority to issue 404 permits within each state, the use of such permits is regulated by each state within their boundaries. The use of a 404 permit in California is regulated by the State Regional Water Quality Control Board (RWQCB) under Section 401 of the state regulations. The Board has authority to issue a 401 permit that allows the use of a 404 permit in the state, with the authority in the state being vested in regional offices. If a 404 permit is required for the project, the 401 permit application will need to address the impact analysis and mitigation requirements for the drainage.

In addition, the Board has the responsibility under its own regulations to require that projects address ground water and water quality issues, which would be evaluated as part of the geotechnical and hydrology studies.

All drainages that leave the property would come under the jurisdiction under the Regional Water Quality Control Board, which is concerned with waters of the State.

### **5.0 Discussion**

The impacts of the specific plan can only be generally assessed, because the plan design is subject to change. However, since most of the proposed development will take place primarily in existing developed or disturbed areas, the majority of the impacts to native animals, plants, and their habitat

will be in the perimeter of the project. The one major exception is the proposed golf course in Waterman Canyon.

Table 1 provides a breakdown of plant communities on site. Table 2 provides an estimate of the impacts to plant communities from the current project development.

**Table 1. Acreage of Plant Communities Within the Property Boundaries**

Plant Community	Acreage
AG/S	258.7
BASIN	39.2
CHA	263.5
CHP	914.3
DIST	35.5
DS	82.3
LS	133.9
MARSH	2.3
MON	38.8
POND	2.2
SAW	40
SWR	20
SWW	48.4
Unclassified non native	21.1
1900.2 Total Acres	

**Table 2. Impact Acreage to Plant Communities Within the Project Area**

Plant Community	Acreage of Impact
AG/S	109.4
BASIN	39.1
CHA	43.2
CHP	13.6
DIST	34.4
DS	16.4
LS	108.6
MARSH	2.3
POND	2.2
SAW	0.2
SWR	19.3
SWW	31.5
420.2 Total Acres	

There is a total of approximately 128.0 acres of potential jurisdictional drainages. The project will impact approximately 58.1 acres. However, a formal delineation will need to be conducted to precisely determine the jurisdictional limits and accurately measure impacts from the development of the project.

## 5.1 General Biological Impacts

### 5.1.1 Plant Communities

The vineyards, or fuel modification zones, and golf course will impact scrub and grassland habitats to varying degrees. Except for the golf course, the total area of impact is small and generally only impacts plant communities that are relatively common in the San Bernardino Mountains.

The proposed golf course may require the removal of significant stands of riparian woodlands. The impacts to these plant communities are considered to be significant.

### **5.1.2 Wildlife**

Reduction of native plant communities through project development will result in the reduction of numbers of wildlife individuals in this area of the San Bernardino Mountains. Smaller and less mobile species, such as small mammals, reptiles and most invertebrates, will experience a direct reduction in population numbers through the loss of individuals resulting from destruction of habitat and direct individual mortality.

Larger and/or more mobile species, such as large mammals and birds, could experience some loss of individuals as a result of the loss of habitat. Loss of individuals from direct mortality is less than for smaller species, since most mobile animals will leave an area with high levels of human disturbance.

The property is located in a fairly open area. With the exception of the golf course (see below), most of the proposed development area has been already impacted by the existing facility. New areas of disturbance are expected to be small, confined mostly to the vineyard/fuel modification zone area or small areas of habitat adjacent to existing development.

The proposed golf course will disrupt a large area of native habitat. Therefore, the long term impacts of the overall project on wildlife species are expected to be significant, primarily because of the golf course. Short term impacts during construction might lead to temporary changes in foraging and land use patterns by resident and nearby species.

### **5.2 Sensitive Biological Resources**

The California Environmental Quality Act addresses the determination of significant impacts. For listed species, any impact will result in mandatory findings of significance. The same is true for any species that meets the criteria for a listed species.

For determination of the level of significance to sensitive but non listed resources, CEQA requires that the impact be such that the habitat of the protected resource will be substantially degraded or reduced, cause a wildlife population to drop below self-sustaining levels, or that the plant or animal community will be eliminated. CEQA also finds that the impacts are significant if there are cumulative effects from future probable projects.

Of the species listed in Table 3, Appendix B, we have identified the following species for which impacts would result in a mandatory finding of significance.

#### **5.2.1. Thread-leaved Brodiaea**

The thread-leaved brodiaea is known to be present on site. Populations have been found in the Steam Cave drainage area on up to probably two acres (no accurate estimates are available), and may occur elsewhere within the property including along Waterman Canyon.

The thread-leaved brodiaea is listed as endangered by the CDFG and as threatened by the USFWS.

### **5.2.2 Nevin's Barberry**

Nevin's barberry has been found on State Route 18 between the property and Rimforest, however, this population is somewhat suspect in its location. Nevertheless, Nevin's barberry is known to occur on steep north-facing slopes and in low grade sandy washes, and could potentially occur in or along the main drainages on site, including Waterman Canyon.

Nevin's barberry is listed as endangered by both the CDFG and the USFWS.

### **5.2.3 Slender-horned Spineflower**

Slender-horned spineflower is not likely to be present except possibly in the lowest reaches of Waterman and East Twin Creeks. No direct impact to this species are expected; however, indirect impacts in the form of polluted water or dumping of excess material could potentially degrade or destroy habitat. Actual loss of plants would be direct impact, while loss of habitat would be an indirect impact.

The spineflower is listed as endangered by both the CDFG and the USFWS.

### **5.2.4 Santa Ana River Woolly Star**

Santa Ana River woolly star is not known from this area, however, potential habitat exists along the lower reaches of the main drainages. No direct impact to these drainages is expected as a result of project construction. Any alteration or polluting of the drainages that destroy plants or their habitat would impact this species. Actual loss of plants would be direct impact, while loss of habitat would be an indirect impact.

The Santa Ana River woolly star is listed as endangered by both the USFWS and the CDFG.

### **5.2.5 Santa Ana River Sucker**

The Santa Ana River sucker is known from swift flowing to sluggish streams with gravelly or rocky beds. It can tolerate shallow water only a few centimeters deep, and is also tolerant of flooding. However, this species is known only from the main rivers in southern California. The downstream flood control basins cut off any opportunity for downstream populations in the Santa Ana River to repopulate these streams, and any resident populations may not have been able to persist over time.

The Santa Ana River sucker is listed as threatened by the USFWS and as a species of special concern by the CDFG. If this species is present, any alteration of water quality would be a significant impact if it results in pollution or increased water turbidity.

### **5.2.6 Arroyo Toad**

The arroyo toad is not known from this area and is not likely to be present over much of the site. There is a low potential for this species to be present in the broader, flatter areas of Waterman Canyon and East Twin Creek.

The arroyo toad is listed as endangered by the USFWS and as a species of special concern by the CDFG. If this species is present, any alteration of flow or contamination of the water would be a significant impact to this species.

If this species is present, upland habitat around the drainage would also require protection. During the dry season of the year, the arroyo toad is known to disperse up to 1 kilometer (0.6 miles) from a drainage in search of food.

### **5.2.7 Red-legged Frog**

Red-legged frog is known only from the City Creek area and is not likely to be present on site; however, it occurs in habitat similar to the mountain yellow-legged frog. This species may be present in the shallower and slower waters of the lower reaches of the property. Impacts to this species include alteration of flow in to the drainages and contamination by polluted water.

The red-legged frog is listed as threatened by the USFWS and as a species of special concern by the CDFG. Any loss of individuals or degradation of habitat would be considered significant.

### **5.2.8 Mountain Yellow-legged Frog**

Mountain yellow-legged frog has been collected in the Arrowhead Springs area, at various locations (not specified) in Waterman Canyon between the Waterman Canyon Station and the junction with State Route 18. The information was not specific with regard to which junction, north or south. This animal has also been found in Strawberry Creek approximately one mile east of Waterman Canyon.

These populations were identified more than 30 years ago, and may no longer persist along these drainages. The mountain yellow-legged frog is listed as endangered by the USFWS and as a species of special concern by the CDFG. If this species is present, the loss, alteration, or contamination of the drainages would potentially impact this species.

### **5.2.9 San Bernardino Kangaroo Rat**

San Bernardino kangaroo rat is not known from the Waterman Canyon area. This species prefers broad terraces and sandy to sandy loam soils with minimal to moderately dense vegetation. The lower reaches of Waterman Canyon and East Twin Creek may provide habitat for this species.

The San Bernardino kangaroo rat is listed as endangered by the USFWS and as a species of special concern by the CDFG. If this species is present, any alteration in the stream bed or pollution of the soil that resulted in the loss of individuals or the degradation of its habitat would be considered significant.

The project is not located in a Critical Habitat area for this species.

### **5.2.10 Other Sensitive Species**

Impacts to the remaining sensitive species potentially present on the Arrowhead Springs Specific Plan project are minimal due to the limited amount of habitat directly and permanently affected by the proposed development. These impacts are not expected to be significant due to one or more of the following factors: 1) No suitable habitat exists on site; or, 2) The use of the site is limited to occasional or seasonal visits and the site does not encompass a substantial portion of their range.

## **5.3 Drainages and Wetlands**

The overall proposed project design avoids most impacts to the large drainages on the property. However, there still remain a number of potential impacts, direct and indirect, to the drainages and wetlands on site.

### **5.3.1. Vineyards and Bridges**

The perimeter impacts mostly result from the proposed vineyards, intended to function as fuel modification zones. These vineyards, or zones, will extend into native habitat. The current design will impact mostly grassland and scrub habitats, depending upon the final width and length of the various zones. There are a number of sensitive plant species in this area that may be impacted by the proposed zones.

Zones C and D in the East Twin Creek and tributary areas (Figure 2) may have additional impacts to riparian habitats, if they are extended down slope into the creek drainages. If no drainages are impacted, no mitigation is required.

Zone B (Figure 2) crosses a potential jurisdictional drainage on the north side of the property. Based on the available information, Zone E (Figure 2) will require substantial alteration to the unnamed drainage along State Route 18.

In addition, there are two bridges that cross potential jurisdictional drainages (Figure 2). The bridge above Lake Vonette will cross a potential CDFG jurisdictional drainage. The second bridge just below the steam caves will cross a CDFG and Corps jurisdictional drainage. Depending upon the design and construction requirements of these bridges, there may be temporary and permanent impacts to these drainages.

### **5.3.2 Golf Course**

The golf course design appears to leave the main drainage channel of Waterman Creek intact, but will impact several side drainages (Figures 2 and 4) and encroach substantially into the drainage floodplain area of the creek. This impact is potentially highly significant because of the wildlife value of the drainage. It is not known if the arroyo toad, red-legged frog, mountain yellow-legged frog, or Santa Ana River sucker occur in this drainage, but if populations exist, the loss of habitat would be significant under the California Environmental Quality Act (CEQA).

The loss of potential arroyo toad habitat extends outside of the creek and the surrounding drainage area. Arroyo toads have been documented to disperse up to 0.6 mile from available water sources during the non-breeding season. Development of the surrounding area for residential use would impact this area.

Red-legged frogs also require more than the main drainage area of the creek in their habitat requirements. They will use riparian habitat cover out to 300 feet from the water.

Indirect impacts to Water man Creek include fertilizer and pesticide runoff from the golf course, which could seriously alter the water quality of the creek as well as downstream waters. If the speckled dace or the Santa Ana River sucker exists in these waters, these species will also be impacted. Mitigation for impacts to Waters of the U. S. and Waters of the State, as well as wetland habitat will require that polluted runoff from the golf course be cleaned before it leaves the golf course.

There may also be direct impacts to Waterman Creek from the design of two proposed ponds along the golf course. Depending upon final pond design, the work may require dredging or filling of the creek, an action regulated by the Corps, CDFG, and RWQCB.

## **5.4 Mitigation Measures**

### **5.4.1 Listed Species**

Focused surveys will need to be conducted for the following listed species to determine their presence or absence on site.

- Thread-leaved brodiaea
- Nevin's barberry
- Slender-horned spineflower
- Santa Ana River woolly star
- Santa Ana River sucker
- Arroyo toad
- California red-legged frog
- Mountain yellow-legged frog
- San Bernardino kangaroo rat

NRA, Inc. also recommends that surveys be conducted to evaluate the extent of sensitive habitats that will be lost as a result of project buildout. Surveys for the various species shall be conducted per the standard protocols for that species.

If the surveys identify any listed species or sensitive species meeting listed standards, appropriate mitigation measures will be required. For thread-leaved brodiaea, Nevin's barberry, and the other sensitive plant species for which impacts would be significant, the surveys will need to focus on the location of the plants with regard to proposed construction. If plants will be impacted, then one or more of the following measures will need to be implemented:

1. Redesign or relocation of the proposed structure to avoid take.
2. Protection and enhancement of remaining habitat on site.
3. Purchase or contribution toward purchase of occupied habitat off-site at a minimum 2:1 ratio.

The mitigation requirements for the various species could potentially be combined, but this will require the approval of the responsible agencies.

All mitigation measures will require the approval of the CDFG and the USFWS, and should be done in conjunction with mitigation measures for potential impacts elsewhere on the property.

For those species found along drainages, the assessment of impacts will need to evaluate both the direct loss of habitat (especially along Waterman Canyon) as well as indirect impacts such as altered water flows or contamination of drainages. These impacts should be addressed along with any mitigation required for impacts to the drainages themselves. Mitigation should include one or more of the following:

1. Avoidance of impacts (redesign or relocation of the proposed development).
2. Elimination of indirect impacts (catch basins, filters, and other control measures).
3. Minimization of impacts to drainages (redirect runoff to flow directly into the flood control channels, maintain connection of water flows down the drainages, and other measures).
4. Enhancement of suitable areas at a 1:1 ratio to increase available habitats for species found on site.
5. Replacement of habitat off-site at a minimum 2:1 ratio.

#### **5.4.2 Drainages and Wetlands**

NRA, Inc. recommends that a formal wetland delineation and jurisdictional drainage determination be conducted to determine the extent of impact resulting from the proposed golf course, fuel modification zones and any other proposed development.

If jurisdiction by the agencies is upheld and if drainages are impacted by the proposed project or project construction, the project proponent will need to acquire the appropriate 404 Permit, 1602 Streambed Agreement and 401 Certification.

CDFG will not accept or review a 1602 Notification application until after adoption of the environmental documents for the project; therefore, the exact acreages and location of the project mitigation cannot be addressed at this time. They should be addressed during the 1602 Notification application and required as part of the 1602 Agreement for the project, with such measures as determined appropriate by the CDFG.

The need for and details of the mitigation measures requires the involvement of the Corps in the 404 permit application, the RWQCB in the 401 certification application, and the CDFG in the 1602 process. NRA, Inc. recommends the Corps be contacted regarding jurisdiction and potential mitigation prior to formal permit application. If a 404 will be required, NRA, Inc. recommends the project proponent also contact the RWQCB.

If the CDFG and Corps claim jurisdiction, and, along with the RWQCB, require mitigation, one or more of the following measures may be required:

1. Avoidance of impacts to the drainage addressed to the extent possible through project design
2. Minimization of impacts addressed to the extent possible through project design
3. Mitigation through replacement of the drainage on site, if possible
4. Mitigation off-site through one or more of the following measures:
  1. Replacement of drainage off-site at a minimum 2:1 ratio.
  2. Contribution to an existing drainage replacement or enhancement program at a minimum 2:1 ratio.
  3. Contribution to a comparable drainage enhancement program such as the giant reed removal program developed by Riverside County for the Santa Ana River at a minimum 2:1 ratio.

At a minimum, a replacement program should contain the following:

1. Purpose and goals
2. Plant species list
3. Planting layout
4. Irrigation systems (passive or active)
5. Maintenance requirements
6. Monitoring requirements
7. Financial support
8. Responsible parties

#### **5.4.3 Raptors, Migratory Birds and Habitats**

With the exception of impacts to Waterman Creek and parts of East Twin Creek, impacts to raptor and migratory bird foraging habitat and habitat fragmentation are not expected to be substantial, because the proposed development is confined mostly to existing disturbed areas.

The proposed golf course could substantially alter the use of the creek drainage by foraging raptors and migratory birds. Downstream near the confluence of East Twin Creek and Waterman Creek, existing

open space with grassland habitat would be replaced with residential development, further reducing the available foraging habitat.

NRA, Inc. recommends that a breeding bird survey be conducted prior to project construction to determine if birds are nesting in the trees or scrub habitats affected by the project. If birds are present, construction should avoid disturbance either by designated setback distances from active nests, or by rescheduling construction to avoid working during the breeding season from February 1 through August 31.

#### **5.4.4 Wildlife Movement and Habitat Fragmentation**

Impacts to north-south wildlife movement will be substantial due to the loss of Waterman Canyon to the golf course, and farther downstream, increased human presence along the banks of the canyon from residential development.

Impacts to wildlife movement east to west could also be substantial in the southern portion of the site due to proposed residential development of mostly open space at the confluence of Waterman and East Twin Creeks.

Maintaining East Twin Creek and Strawberry Creek drainages in their current condition (subject to natural events such as wildfires and storms) will act to partially offset the impacts to wildlife movement. However, a reduction in the wildlife use of the area will be unavoidable. The conversion of Waterman Canyon will have a substantial effect on wildlife movement and use that cannot be fully offset by the preservation of the main drainage channel of the creek.

Habitat fragmentation will not be substantial for most of the project, since most of the development will take place in areas already in use. The conversion of Waterman Canyon to golf course and residential development will substantially divide the habitat and wildlife use of this area of the property in the Canyon, making it difficult for wildlife on one side of State Route 18 to move freely to the other side.

Although the proposed development will increase human activity and presence in the area, most of the impact will be in areas that have been occupied in the past. However, the density of the development will be greater with the proposed project than with past use, in that year round occupancy, rather than occasional use of the site, will increase. This will result in wildlife moving farther from the project area, especially with the introduction of exotic pets and plants that typically come with residential development. The impact is somewhat partially offset by the preservation of Strawberry and East Twin Creek, however the (relatively) high increase in human activity will inevitably reduce the available habitat for wildlife sensitive to the presence of humans.

### **5.5 Other Issues**

#### **5.5.1 Water Drawdown**

The project proponent is currently proposing to use surface water from Waterman Canyon and East Twin Creek as a source of irrigation water for the project. Estimates of current flow in the creek is reported as November 20, 2004 Revised July 12, 2005 Arrowhead Springs Specific Plan TPC04-101

varying from 192 acre feet to 10,700 acre feet (over the 77 years that it has been measured). On average, the drawdown would be approximately 600 acre feet. However, no minimum sustainable level was identified in the discussion which would allow persistence of the water flow and maintenance of the riparian habitat along these drainages in dry years.

Any removal of the water that alters the streambed or affects habitat and wildlife along the drainage would be considered a significant impact. Any mitigation for the loss of riparian areas would have to address the physical changes required to draw water from the drainages.

### **5.5.2 Best Management Practices**

As a best management practice measure, NRA, Inc. recommends that landscape palettes be specified to prohibit the use of invasive or non-native plants, to minimize the degradation of native habitats. The California Invasive Plant Council ([www.caleppc.org](http://www.caleppc.org)) provide substantial information on weed pests, along with recommendations regarding the use of non-native plants in landscaping.

## 6.0 References

- Atwood, J. L. 1990. *Status Review of the California Gnatcatcher (Polioptila californica)*. Unpublished technical report, Manomet Bird Observatory, Manomet, MA. 79 pp.
- Ball, D. A., D. Cudney, S. A. Dewey, C.L. Elmore, R. G. Lym, D. W. Morishita, R. Parker, D. G. Swan, T. D. Whitson, and R. K. Zollinger, eds., 2000. *Weeds of the West*, University of Wyoming.
- Borror, D. J. and R. E. White, 1970. *A Field Guide to the Insects*. Houghton Mifflin Company, Boston, Massachusetts.
- Burt, W. H., 1986. *A Field Guide to the Mammals in North American North of Mexico*. Houghton Mifflin Company, Boston, Massachusetts.
- California Department of Fish and Game, 1988. *California's Wildlife, Volume 1, Amphibians and Reptiles*. The Resources Agency, Sacramento, California.
- California Department of Fish and Game, 1990. *California's Wildlife, Volume 2, Birds*. The Resources Agency, Sacramento, California.
- California Department of Fish and Game, 1990. *California's Wildlife, Volume 3, Mammals*. The Resources Agency, Sacramento, California.
- California Natural Diversity Data Base, 2002. Data Base report on threatened, endangered, rare or otherwise sensitive species and communities in the vicinity of the Arrowhead Springs Roadway project site.
- California Department of Fish and Game, 2002. *Special Animals List*. California Natural Diversity Data Base, The Resources Agency, Sacramento, California.
- California Department of Fish and Game, 2001. *Special Vascular Plants., Bryophytes, and Lichens List*, California Natural Diversity Data Base, The Resources Agency, Sacramento, California.
- Garrett, K. and J. Dunn, 1981. *Birds of Southern California*. Los Angeles Audubon Society. The Artisan Press, Los Angeles, California.
- Grenfell, W. E., M. D. Parisi, and D. McGriff, 2003. "A Check-list of the Amphibians, Reptiles, Birds and Mammals of California". California Wildlife Habitat Relationship System, California Department of Fish and Game, Sacramento, California.
- Hall, E. R., 1981. *The Mammals of North America*, Volumes I and II. John Wiley and Sons, New York, New York.
- Hickman, J. C., ed. 1993. *The Jepson Manual: Higher Plants of California*. University of California Press.

- Ingles, L. G., 1965. *Mammals of the Pacific States*. Stanford University Press, Stanford, California.
- McKernan, R. L., 1997. *The Status and Known Distribution of the San Bernardino Kangaroo Rat (Dipodomys merriami parvus): Field surveys conducted between 1987 and 1996*. Report prepared for the U. S. Fish and Wildlife Service, Carlsbad Field Office.
- Munz, P.A., 1974. *A Flora of Southern California*. University of California Press, Berkeley, California.
- Remsen, Jr., J. V., 1978. *Bird Species of Special Concern in California*. Non-game Wildlife Investigations. Wildlife Management Branch Administrative Report No 78-1. Report prepared for the California Department of Fish and Game.
- Stebbins, R. C., 1985. *A Field Guide to Western Reptiles and Amphibians*. Houghton Mifflin Company, Boston.
- Tibor, D. P., 2001. *Inventory of Rare and Endangered Vascular Plants of California*. California Native Plant Society, Spec. Pub. No. 1 (6th edition), Sacramento, California.
- U. S. Fish and Wildlife Service, 1996. *Review of plant and animal taxa for listing as endangered or threatened species; notice of review*. Federal Register Vol. 61, No. 40.
- Williams, D. F., 1986. *Mammalian Species of Special Concern in California*. Wildlife Management Division Administrative Report 86-1. Prepared for The Resources Agency, California Department of Fish and Game.

## Appendix A - Flora and Fauna Compendia

This list does not include all of the landscape plant species found on site.

### Flora

\* denotes non-native species

#### GYMNOSPERMAE

##### Pteridaceae

*Pellaea andromedaefolia*  
*Pentagramma triangularis*

#### ANGIOSPERMAE: DICOTYLEDONES

##### Anacardiaceae

*Rhus trilobata*  
\**Schinus molle*  
*Toxicodendron diversilobum*

##### Amaranthaceae

*Amaranthus albus*

##### Apocynaceae

*Nerium oleander*

##### Asteraceae

*Ambrosia acanthicarpa*  
*Artemisia californica*  
*Artemisia douglasiana*  
*Artemisia dracuncululus*  
*Baccharis salicifolia*  
*Brickellia californica*  
*Encelia farinosa*  
\**Centaurea melitensis*  
\**Conyza bonariensis*  
\**Chrysanthemum* sp.  
\**Filago gallica*  
*Gnaphalium californicum*  
*Helianthus annuus*  
*Heterotheca grandiflora*  
*Lessingia filaginifolia*  
*Stephanomeria virgata*  
*Tetradymia comosa*

#### NAKED SEED PLANTS

##### Brake family

Coffee fern  
Goldenback fern

#### DICOT FLOWERING PLANTS

##### Sumac family

Squaw bush  
Peruvian pepper tree  
Poison oak

##### Amaranthus family

Tumbleweed

##### Dogbane family

Oleander

##### Sunflower family

Annual bursage  
California sagebrush  
Mugwort  
Tarragon  
Mulefat  
California bristlebush  
California brittlebush  
Tocalote  
Mare's tails  
Chrysanthemum  
Brown filago  
California everlasting  
Annual sunflower  
Telegraph weed  
Cudweed aster  
Twiggy wreathplant  
Cotton-thorn

<b>Betulaceae</b> <i>Alnus rhombifolia</i>	<b>Birch family</b> White alder
<b>Brassicaceae</b> <i>*Hirschfeldia incana</i> <i>Sisymbrium</i> sp.	<b>Mustard family</b> Short-podded mustard Tumble mustard
<b>Caprifoliaceae</b> <i>Sambucus mexicana</i>	<b>Honeysuckle family</b> Mexican elderberry
<b>Chenopodiaceae</b> <i>Chenopodium album</i> <i>*Salsola tragus</i>	<b>Saltbush family</b> Lamb's quarters Russian thistle
<b>Convolvulaceae</b> <i>*Convolvulus arvensis</i>	<b>Morning glory family</b> Bindweed
<b>Cucurbitaceae</b> <i>Marah macrocarpa</i>	<b>Gourd family</b> Wild cucumber
<b>Euphorbiaceae</b> <i>Croton californica</i> <i>*Ricinus communis</i>	<b>Spurge family</b> Croton Castor bean
<b>Fabaceae</b> <i>Lotus</i> sp. <i>Lotus scoparius</i> <i>Melilotus albus</i> <i>Mimulus cardinalis</i> <i>Mimulus guttatus</i> <i>*Spartium junceum</i>	<b>Pea family</b> Lotus Deer weed White sweetclover Red monkeyflower Yellow monkeyflower Spanish broom
<b>Fagaceae</b> <i>Quercus berberidifolia</i> <i>Quercus chrysolepis</i>	<b>Oak family</b> Scrub oak Canyon live oak
<b>Geraniaceae</b> <i>*Erodium cicutarium</i>	<b>Geranium family</b> Red-stemmed filaree
<b>Hydrophyllaceae</b> <i>Eriodictyon trichocalyx</i> <i>Phacelia ramosissima</i>	<b>Waterleaf family</b> Yerba santa Branching phacelia
<b>Juglandaceae</b> <i>Juglans californica</i>	<b>Walnut family</b> California walnut

<b>Lamiaceae</b> <i>*Marrubium vulgare</i> <i>Salvia apiana</i> <i>Salvia mellifera</i> <i>Trichostemma lanatum</i>	<b>Mint family</b> Horehound White sage Black sage Woolly blue curls
<b>Lauraceae</b> <i>Umbellularia californica</i>	<b>Laurel family</b> California bay
<b>Moraceae</b> <i>Ficus carica</i>	<b>Ficus family</b> Common fig
<b>Myrtaceae</b> <i>*Eucalyptus</i> sp. <i>*Eucalyptus globulus</i>	<b>Myrtle family</b> Eucalyptus Blue gum
<b>Nyctaginaceae</b> <i>Mirabilis californica</i>	<b>Four o'clock family</b> Wishbone bush
<b>Oleaceae</b> <i>*Olea europea</i>	<b>Olive family</b> Olive
<b>Platanaceae</b> <i>Platanus racemosa</i>	<b>Sycamore family</b> Sycamore
<b>Polygonaceae</b> <i>Eriogonum fasciculatum</i> <i>Eriogonum</i> sp. <i>Rumex crispus</i>	<b>Buckwheat family</b> California buckwheat Buckwheat Curly dock
<b>Rhamnaceae</b> <i>Ceanothus crassifolius</i> <i>Ceanothus cuneatus</i> <i>Rhamnus</i> sp.	<b>Buckthorn family</b> Hoaryleaf ceanothus Buckbrush Buckthorn
<b>Rosaceae</b> <i>Adenostoma fasciculatum</i> <i>Cercocarpus betuloides</i>	<b>Rose family</b> Chamise Mountain mahogany
<b>Salicaceae</b> <i>Populus fremontii</i> <i>Salix goodingii</i> <i>Salix laevigata</i> <i>Salix lasiolepis</i>	<b>Willow family</b> Fremont's cottonwood Black willow Red willow Arroyo willow

**Saxifragaceae**

*Ribes cereum*

**Saxifrage family**

Squaw currant

**Scrophulariaceae**

*Mimulus guttatus*

*Penstemon centranthifolius*

*Verbascum thapsis\**

**Snapdragon family**

Yellow monkeyflower

Scarlet bugler

Common mullein

**Solanaceae**

*Datura wrightii*

*Nicotiana glauca*

*Solanum douglasiana*

\**Verbascum thapsis*

**Nightshade family**

Jimson weed

Indian tree tobacco

White-flowered deadly nightshade

Common mullein

**Sterculiaceae**

*Fremontodendron californicum*

**Cacao family**

Flannel bush

**Tamaricaceae**

\**Tamarix aphylla*

**Tamarisk family**

Athel

**Vitaceae**

*Vitis girdiana*

**Grape family**

Wild grape

**ANGIOSPERMAE: MONOCOTYLEDONAE**

**MONOCOT FLOWERING PLANTS**

**Arecaceae**

\*species name unknown

\**Phoenix canariensis*

**Palm family**

Mexican fan palm

Canary palm

**Cyperaceae**

*Schoenus nigricans*

**Sedge family**

Black sedge

**Liliaceae**

*Calochortus* sp.

*Yucca whipplei*

**Lily family**

Calochortus

Whipple's yucca

**Poaceae**

\**Arundo donax*

\**Avena barbata*

\**Bromus diandrus*

\**Bromus madritensis*

\**Cortaderia selloana*

\**Cynodon dactylon*

*Leymus condensatus*

*Nassella lepida*

**Grass family**

Giant reed

Slender wild oats

Ripgut brome

Red brome

Pampas grass

Bermuda grass

Short-seeded ryegrass

Foothill needlegrass

\**Pennisetum setaceum*

Fountain grass

\**Schismus barbatus*

Mediterranean grass

**Typhaceae**

**Cattail family**

*Typha latifolia*

Broad-leaved cattail

Taxonomy and nomenclature follow Hickman 1993 and Munz 1974.

**Fauna**

**ARTHROPODA**

**ARTHROPODS**

**Apidae**

**Bee family**

*Apis mellifera*

Honey bee

**Pieridae**

**White and sulfur butterfly family**

*Artogeia rapae*

Cabbage butterfly

**Tenebrionidae**

**Darkling beetle family**

*Eleodes* sp.

Darkling beetle

**REPTILIA**

**REPTILES**

**Phrynosomatidae**

**Spiny lizards and their allies**

*Sceloporus occidentalis*

Western fence lizard

*Uta stansburiana*

Side-blotched lizard

**AVES**

**BIRDS**

**Ardeidae**

**Herons and bitterns**

*Ardea alba*

Great egret

**Accipitridae**

**Kites, hawks and eagles**

*Circus cyaneus*

Northern harrier

*Buteo lineatus*

Red-shouldered hawk

*Buteo jamaicensis*

Red-tailed hawk

**Falconidae**

**Caracaras and falcons**

*Falco sparverius*

American kestrel

**Odontophoridae**

**New World Quail**

*Callipepla californica*

California quail

**Columbidae**

*Columba fasciata*  
*Zenaida macroura*

**Pigeons and doves**

Band-tailed pigeon  
Mourning dove

**Picidae**

*Melanerpes formicivorus*  
*Picoides nuttallii*  
*Colaptes auratus*

**Woodpeckers and relatives**

Acorn woodpecker  
Nuttall's woodpecker  
Northern flicker

**Tyrannidae**

*Sayornis nigricans*  
*Sayornis saya*

**Tyrant flycatchers**

Black phoebe  
Say's phoebe

**Corvidae**

*Cyanocitta stelleri*  
*Aphelocoma californica*  
*Corvus brachyrhynchos*

**Crows and ravens**

Steller's jay  
Western scrub jay  
American crow

**Aegithalidae**

*Psaltriparus minimus*

**Bushtits**

Bushtit

**Troglodytidae**

*Catherpes mexicanus*

**Wrens**

Canyon wren

**Regulidae**

*Regulus calendula*

**Kinglets**

Ruby-crowned kinglet

**Sylviidae**

*Polioptila caerulea*

**Old World warblers and relatives**

Blue-gray gnatcatcher

**Parulidae**

*Dendroica coronata*

**Wood warblers and relatives**

Yellow-rumped warbler

**Emberizidae**

*Pipilo crissalis*  
*Melospiza melodia*  
*Zonotrichia leucophrys*

**Sparrows, blackbirds, and relatives**

California towhee  
Song sparrow  
White-crowned sparrow

**Fringillidae**

*Carpodacus neomexicanus*  
*Carduelis psaltria*  
*Carduelis mexicanus*

**Finches**

House finch  
Lesser goldfinch  
Lawrence's goldfinch

**MAMMALIA**

**Leporidae**

*Sylvilagus audubonii*

**Sciuridae**

*Spermophilus beecheyi*

**Geomyidae**

*Thomomys bottae*

**Heteromyidae**

*Dipodomys* sp.

**Canidae**

*Canis latrans*

**MAMMALS**

**Rabbits and hares**

Audubon's cottontail

**Squirrels, chipmunks and marmots**

California ground squirrel

**Pocket gophers**

Botta's pocket gopher

**Pocket mice and kangaroo rats**

Kangaroo rat, species unknown

**Foxes, wolves and relatives**

Coyote

Nomenclature follows Borror and White 1970, Hall 1981, Laudenslayer et al. 1991, and Stebbins 1966.

**Appendix B Sensitive Biological Resources Table**

Table 2. Sensitive Biological Resources – Arrowhead Springs

Resource	Habitat And Distribution	Activity Period	Status Designation	Occurrence Probability
<b>Plants</b>				
<b>Marsh sandwort</b> <i>Arenaria paludicola</i>	Perennial plant. Occasionally in boggy meadows, swamps and freshwater marshes. Less than 900 feet elevation. San Bernardino, Los Angeles, Santa Barbara counties. To Washington State. In San Bernardino, mostly along Santa Ana River.	May - Aug flowering period	FED: END STATE: END CNPS: 1B	None. Although there may be boggy places in and around the Arrowhead Springs Hotel, the area is probably too high in elevation and too steep to provide suitable habitat.
<b>Nevin's barberry</b> <i>Berberis nevadensis</i>	Perennial. Sandy and gravelly places below 2000 feet. Coastal sage scrub and chaparral. Hills south of Loma Linda, San Bernardino. Co. and in the area around Vail Lake, Riverside Co.	Year round	FED: END STATE: END CNPS: 1B	Low. This species seems to prefer drier slopes; however, it could potentially occur on the hillsides along the upper drainages.
<b>Thread-leaved brodiaea</b> <i>Brodiaea filifolia</i>	Clay soils; open grasslands at edges of vernal pools or floodplains. Sea level to 2500 ft. elevation. Los Angeles, Orange, San Bernardino, Riverside, and San Diego Counties.	April - June	FED: THR STATE: END CNPS: 1B	High. Species has been found in the vicinity of the Arrowhead Springs Hotel on clay soils probably inundated by warm water.
<b>Orcutt's brodiaea</b> <i>Brodiaea orcutti</i>	Near streams, in vernal pools and seeps, up to 5500 feet elevation. Chaparral, yellow pine forest, primarily San Diego Co.	April - July	FED: C2* STATE: ND CNPS: 1B	Low. This species is not known from San Bernardino County; however, suitable habitat exists on the hills within the project area around the Arrowhead Springs Hotel.
<b>Palmer's mariposa lily</b> <i>Calochortus palmeri</i> var. <i>palmeri</i>	Meadows and moist places in early spring. 3500 to 6500 feet. Chaparral and yellow pine forest. San Bernardino Mts. to Tehachapi Mts. East San Luis Obispo.	May - July	FED: C2* STATE: ND CNPS: List 1B	Low. The project area does not support true meadows or moist places, however there may be moist places in and around the Arrowhead Springs Hotel.

Table 2. Sensitive Biological Resources – Arrowhead Springs

Resource	Habitat And Distribution	Activity Period	Status Designation	Occurrence Probability
Plummer's mariposa lily <i>Calochortus plummerae</i>	Dry, rocky areas in coastal sage scrub, chaparral and yellow pine forest. Below 1700 meters (5000 feet) elevation. Santa Monica Mtns. to San Jacinto Mtns.	May – July	FED: C2* STATE: ND CNPS: 1B	Moderate. Site supports suitable habitat in the hillside areas.
Intermediate mariposa lily <i>Calochortus weedii</i> var. <i>intermedius</i>	Dry, rocky, open slopes, often in chaparral, coastal sage scrub, valley & foothill grassland below 2000 ft. elevation. Los Angeles, Orange, and Riverside Counties.	June – July	FED: C2* STATE: ND CNPS: 1B	Low. Species is not known from San Bernardino County, but the site supports suitable habitat in the hillside areas of the property.
Bristly sedge <i>Carex comosa</i>	Perennial. Swampy places, San Bernardino Valley. Central California to Washington.	Year round	FED: ND STATE: ND CNPS: 2	Low. There may be habitat in and around the Arrowhead Springs Hotel.
San Bernardino Mountains owl's clover <i>Castilleja lasiorhyncha</i>	Annual. Meadows from 4600 to 7400 feet. Yellow pine forest. San Bernardino Mountains to Cuyamaca Mountains.	June - July	FED: C2* STATE: ND CNPS: 1B	None. No meadows exist within the project areas; the development portions of the site are too low and lack pine forest meadow habitat.
Smooth tarplant <i>Centromadia pungens</i> ssp. <i>laevis</i>	Often in disturbed sites near the coast. Also found on alkaline soils at the edges of marshes, swamps, playas and chenopod scrub. Found in riparian areas, valley and foothill grasslands, and sometimes vernal pools margins. Southern California and Baja California.	April - September	FED: C2* STATE: ND CNPS: 1B	Moderate. Site contains suitable alkaline soils around the Arrowhead Springs Hotel. In addition, there are riparian areas for this species within the drainages.
Parry's spineflower <i>Chorizanthe parryi</i> var. <i>parryi</i>	Sandy openings in coastal sage scrub and chaparral, 900 to 3500 ft. Elevation, east Los Angeles Co. to San Geronio Pass and west Riverside Co.	April - June flowering period	FED: C2* STATE: ND CNPS: 3	Moderate. Suitable habitat exists for this species.

Table 2. Sensitive Biological Resources – Arrowhead Springs

Resource	Habitat And Distribution	Activity Period	Status Designation	Occurrence Probability
Long-spined spineflower <i>Chorizanthe polygonoides</i> var. <i>longispina</i>	Dry places below 5000 feet; chaparral, coastal sage scrub, meadows, valley and foothill grassland. West Riverside and San Diego counties.	Not documented	FED: ND STATE: ND CNPS: 1B	Low. Suitable habitat exists on site, however, this species is not recorded from San Bernardino County.
Summer holly <i>Comarostaphylis diversifolia</i> ssp. <i>diversifolia</i>	Shrub. Mixed chaparral, often following a burn.	May - June	FED: ND STATE: ND CNPS: 1B	High. Chaparral and chamise chaparral is extensive in the hills around the development.
Salt marsh bird's beak <i>Cordylanthus maritimus</i> ssp. <i>maritimus</i>	Coastal salt marsh below 10 meters (30 feet) elevation. Southern California coast.	May - Oct	FED: END STATE: END CNPS: 1B	None. No suitable habitat exists on site. Although historical records exist for this site, the records are questionable since this area is atypical for this species and the only locality description provided is "San Bernardino Valley".
Slender-horned spineflower <i>Dodecahema leptoceras</i>	Sandy and gravelly soils on alluvial fans and old floodplains; 500 to 2000 ft. elevation. Los Angeles, Riverside, and San Bernardino Counties.	Apr - Jun	FED: END STATE: END CNPS: 1B	Low. Suitable sandy and gravelly soils have been significantly impacted by flood control measures, however, it may be present in the lower reaches of Waterman and East Twin creeks.
Many-stemmed dudleya <i>Dudleya multicaulis</i>	Annual. In heavy, often clayey soils or grassy slopes in chaparral, coastal sage scrub, valley and foothill grassland. Riverside, San Bernardino, Orange counties. Below 2000 feet.	May - June	FED: C2* STATE: ND CNPS: 1B	Moderate. This species may be present on the hillsides within the project area.

Table 2. Sensitive Biological Resources – Arrowhead Springs

Resource	Habitat And Distribution	Activity Period	Status Designation	Occurrence Probability
<b>Santa Ana River woolly star</b> <i>Eriastrum densifolium</i> var. <i>sanctorum</i>	Perennial subshrub found in alluvial fan sage scrub, coastal sage scrub on alluvial deposits along the Santa Ana River, San Bernardino Co.	June – August flowering period	FED: END STATE: END CNPS: 1B	Low. There is no alluvial fan scrub on site; however, the lower reaches of Waterman and Eat Twin creeks may provide sufficient alluvial soils for this species.
<b>Hot springs fimbriatylis</b> <i>Fimbristylis thermalis</i>	Perennial herb with rhizomes. Alkaline meadows near hot springs.	Year round	FED: ND STATE: ND CNPS: 1B	None. Only known locality within the project area is at the Arrowhead Hot Springs. This area was checked in 1993 and the population apparently had been extirpated.
<b>Robinson's pepper-grass</b> <i>Lepidium virginicum</i> ssp. <i>Robinsonii</i>	Annual. Chaparral, coastal sage scrub habitats, primarily on dry soils. From Los Angeles County south to Baja California.	Jan – April	FED: ND STATE: ND CNPS: 1B	Moderate. Suitable habitat on site.
<b>Parish's desert-thorn</b> <i>Lycium parishii</i>	Perennial shrub. Sandy to rocky slopes and canyons below 2000 feet. Possibly coastal sage scrub, def. In creosote bush scrub. San Bernardino Valley and western Colorado Desert.	March - April flower period	FED: ND STATE: ND CNPS: 2	Low. Recent data suggest that known populations from the lower slopes of the San Bernardino Mountains are probably extirpated.
<b>San Bernardino Mountains monkeyflower</b> <i>Mimulus exiguus</i>	Annual. Moist disturbed places, as in Holcomb Valley. San Bernardino Mountains, northern Baja.	June - July	FED: C2* STATE: ND CNPS: 1B	Low. Little is known about this species. It could occur in the moist areas around the Arrowhead Springs Hotel.
<b>Hall's monardella</b> <i>Monardella macrantha</i> spp. <i>hallii</i>	Perennial from slender woody rootstocks. Dry slopes and ridges, 2500 - 6000 feet. Chaparral, yellow pine forest. San Gabriel and San Bernardino Mtns. to Cuyamaca and Santa Ana Mtns.	June - Aug flowering period	FED: C2* STATE: ND CNPS: 1B	Low. This species is generally found only at higher elevations, and may be present on the higher slopes of the property.

Table 2. Sensitive Biological Resources – Arrowhead Springs

Resource	Habitat And Distribution	Activity Period	Status Designation	Occurrence Probability
California muhly <i>Muhlenbergia californica</i>	Perennial. Occasional in wet places up to 7000 feet. Coastal sage scrub, chaparral, yellow pine forest. Cismontane especially around the San Bernardino Valley to the edge of the desert.	July - Sept flowering period	FED: ND STATE: ND CNPS: 1B	Moderate. Suitable habitat exists within the project area along the drainages.
Parish's yampah <i>Perideridia parishii</i> ssp. <i>parishii</i>	Damp meadows, etc. From 4000 to 7500 feet. Large montane coniferous forest. San Bernardino Mountains.	June - July	FED: ND STATE: ND CNPS: 2	None. The project area does not support the damp meadows and is below the known elevation range.
Parish's gooseberry <i>Ribes divaricatum</i> var. <i>parishii</i>	Perennial. Willow thickets, swamps, similar moist and damp sites. Coastal sage scrub. San Bernardino region and Los Angeles County.	March - April flowering period	FED: C2* STATE: ND CNPS: 1B	Low. Site does not have true thickets or swamps.
Gambel's water cress <i>Rorippa gambelii</i>	Perennial. Marshes, streambanks and lake margins. Ventura to San Diego counties, including Riverside and San Bernardino counties.	Unknown	FED: ND STATE: ND CNPS: 1B	Moderate. Suitable streambanks are present within the project area.
Black sedge <i>Schoenus nigricans</i>	Marshes and swamps. Often in alkaline meadows. 150 - 2000 meters (450 to 6000 feet) elevation.	August-September	FED: ND STATE: ND CNPS: 2	High. At least one population identified from the Arrowhead Springs area.
Sonoran maiden fern <i>Thelypteris puberula</i> var. <i>sonorensis</i>	Occasional in meadows, seeps, wet shaded canyons below 3000 feet; chaparral, creosote bush scrub. Lower slopes of Peninsular and Transverse mountains to Baja California.	Year round	FED: ND STATE: ND CNPS: 2	Moderate. Suitable habitat may be present in the upper reaches of Waterman Canyon within the project area.

Table 2. Sensitive Biological Resources – Arrowhead Springs

Resource	Habitat And Distribution	Activity Period	Status Designation	Occurrence Probability
<b>Fish</b>				
Speckled dace <i>Rhinichthys osculus</i> ssp 3	Found only in streams with permanent flower water, and summer temperatures ranging from 17 to 20 degrees Centigrade (60 to 70 degrees Fahrenheit). It prefers shallow cobble and gravel found along steep rocky canyons in chaparral. Overhanging plants, mainly alders and sedges, provide cover. San Gabriel and Santa Ana rivers.	Year round	FED: ND STATE: CSC FS: Sensitive	Present. This species is known from Strawberry Creek and may be present in East Twin Creek and Waterman Canyon.
Santa Ana sucker <i>Catostomus santaanae</i>	Generally lives in small, shallow streams. Stream current can range from swift to sluggish. They are found only in permanent streams, with water depths from a few centimeters to more than one meter. Prefer coarse substrates of gravel, rubble, and boulders, usually with filamentous algae. Occasionally found in sandy or muddy substrates. Prefers cool, clean, and clear, water, but can tolerate seasonally turbid water. Santa Ana, Santa Clara, San Gabriel and Los Angeles rivers.	Year round	FED: THR STATE: CSC	Unknown. depth may be to shallow to support this species.
<b>Amphibians</b>				
San Gabriel slender salamander <i>Batrachoseps gabrieli</i>	Known only from the San Gabriel Mountains. Prefers rocks, wood, fern and other material for cover. Found on soils at the base of talus slopes.	?	FED: ND STATE: ND	Moderate. Suitable habitat may be present in the upper reaches of Waterman Canyon within the project area.

Table 2. Sensitive Biological Resources – Arrowhead Springs

Resource	Habitat And Distribution	Activity Period	Status Designation	Occurrence Probability
<b>Western spadefoot</b> <i>Scaphiopus hammondi</i>	Grasslands and occasionally hardwood woodlands; largely terrestrial but for breeding, requires rain pools or other ponded water for 3+ weeks; burrows in loose soils during dry season; Central Valley and foothills, coast ranges, inland valleys, to Baja Calif.	October–April (following onset of winter rains)	FED: ND STATE: CSC	Low. Suitable ponded water habitat may exist along Waterman Canyon and East Twin Creek. Suitable habitat also may exist in the isolated pond on the former grounds of the Arrowhead Springs Hotel.
<b>Arroyo toad</b> <i>Bufo microscaphus</i>	Washes and arroyos with open water; sand or gravel beds; for breeding, pools with sparse overstory vegetation. Coastal and a few desert streams from Santa Barbara Co. to Baja Calif.	Mar - Jul	FED: END STATE: CSC	Low. Suitable water habitat may exist along Waterman Canyon and East Twin Creek. Suitable habitat also may exist in the isolated pond on the former grounds of the Arrowhead Springs Hotel.
<b>California red-legged frog</b> <i>Rana aurora draytonii</i>	Streams with slow-moving water and deep pools; dense, shrubby riparian vegetation at pool edges. Coastal streams from Marin Co. to Ventura Co.; between Ventura Co. and Mexican border, known from only four small populations including Santa Rosa Plateau (Riverside Co.).	Dec - Apr	FED: THR STATE: CSC	Moderate. Suitable water habitat may exist along Waterman Canyon and East Twin Creek.
<b>Mountain yellow-legged frog</b> <i>Rana muscosa</i>	Always encountered within a few feet of water. Rocky stream courses in southern California. Tadpoles may require up to two years to complete aquatic development.	Mar - May breeding period	FED: END STATE: CSC	High. Suitable water habitat may exist along Waterman Canyon and East Twin Creek.

Table 2. Sensitive Biological Resources – Arrowhead Springs

Resource	Habitat And Distribution	Activity Period	Status Designation	Occurrence Probability
<b>Reptiles</b>				
<b>Southwestern pond turtle</b> <i>Clemmys marmorata pallida</i>	Permanent or nearly permanent water in a wide variety of habitats; requires basking sites such as partially submerged logs, rocks, or open mud banks. Central California to northwestern Baja California.	Year-round with reduced activity Nov. - Mar.	FED: ND STATE: CSC	Low. Basking sites may be absent except in the upper Waterman Canyon area.
<b>San Diego horned lizard</b> <i>Phrynosoma coronatum blainvillei</i>	Wide variety of habitats including coastal sage scrub, grassland, riparian woodland; typically on or near loose sandy soils; coastal and inland areas from Ventura Co. to Baja Calif.	April - July (with reduced activity Aug. - Oct.)	FED: ND STATE: CSC	High. Suitable habitat exists throughout the project area.
<b>Coronado skink</b> <i>Eumeces skiltonianus interparietalis</i>	Early successional stages or open areas in grassland, chaparral, pinyon-juniper and juniper sage woodland, pine oak and pine forests in the coastal ranges of southern California. Also found in rocky areas close to streams, and on dry hillsides.	Active year round	FED: ND STATE: CSC	High. Suitable habitat exists throughout the project area.
<b>Orange-throated whiptail</b> <i>Aspidoscelis hyperythrus</i>	Floodplains and terraces with perennial plants and open areas nearby; sea level to 3000 feet elevation; inland and coastal valleys of Riverside, Orange, and San Diego Counties. to Baja Calif.	March - July (with reduced activity Aug. - Feb.)	FED: ND STATE: CSC	High. Suitable habitat exists throughout the project area.
<b>Coastal western whiptail</b> <i>Aspidoscelis tigris multiscutatus</i>	Firm, sandy or rocky soils in deserts and semiarid areas with sparse vegetation and open areas. Also found in woodland and riparian areas.	Year round	FED: ND STATE: ND	High. Suitable habitat exists throughout the project area.

Table 2. Sensitive Biological Resources – Arrowhead Springs

Resource	Habitat And Distribution	Activity Period	Status Designation	Occurrence Probability
<p><b>Silvery legless lizard</b>  <i>Anniella pulchra pulchra</i></p>	<p>Found predominantly in the Coast Ranges, Transverse Mountains, and Peninsular Ranges and in northwest Baja California. Also found in scattered occurrences on the floor of the San Joaquin Valley, in the southern Sierra, Walker Basin and in the Piute, Scodie and Tehachapi Mountains. Desert-edge localities are recorded at the eastern end of Walker Pass in Kern County, Morongo Pass, in San Bernardino County, in the Little San Bernardino Mountains at Whitewater, Riverside County, and on the eastern slopes of the Peninsular Ranges. Prefers areas with sandy or loose organic soils or with abundant leaf litter.</p>	<p>Active year-round - some winter activity</p>	<p>FED: ND                      STATE: CSC</p>	<p>Low. Although sandy soils occur on site, abundant leaf litter (providing a humid microclimate) is limited.</p>
<p><b>Southern rubber boa</b> (<i>Charina bottae umbratica</i>)</p>	<p>Usually occurs in moist woodlands and coniferous forests. Mixed conifer-oak forest and woodlands at elevations 5000 to 8000 feet. Prefers old large logs, rock piles as hibernacula, as well as dense leaf litter. High soil moisture seems important, although has been found on dry slopes. Active during evening or heavily overcast days with high humidity and temperatures of 60 - 70 degrees Fahrenheit. Probably hibernates November to March. Records from San Bernardino, San Jacinto Mountains and Mt. Pinos.</p>	<p>April - October</p>	<p>FED: C2*                      STATE: THR                      US Forest Service                      Species of Concern</p>	<p>None. The development portion of the site does not contain conifer woodland habitat.</p>

Table 2. Sensitive Biological Resources – Arrowhead Springs

Resource	Habitat And Distribution	Activity Period	Status Designation	Occurrence Probability
<b>Rosy boa</b> <i>Lichanura trivirgata</i>	Mix brushy cover and rocky soils. Desert and chaparral, found from the coast to the Mojave and Colorado deserts. Prefers moderate to dense vegetation.	Year round	FED: ND STATE: ND	High. Suitable habitat exists throughout the project area.
<b>Coast patch-nosed snake</b> <i>Salvadora hexalepis virgultea</i>	Widely distributed from the lowlands up to 7000 feet. Found in grasslands, coastal sage scrub and chaparral. On both rocky and sandy substrate.	Year round	FED: ND STATE: CSC	High. Suitable habitat exists throughout the project area.
<b>Two-striped garter snake</b> <i>Thamnophis hammondi</i>	Highly aquatic. Only in or near permanent sources of water. Streams with rocky beds supporting willows or other riparian vegetation. From Monterey Co. to northwest Baja Calif. Has been in dry washes.	Year round	FED: ND STATE: CSC	Low. Suitable habitat exists along in the upper reaches of of the main drainages. Suitable habitat also may exists in the isolated pond on the former grounds of the Arrowhead Springs Hotel.
<b>Northern red-diamond rattlesnake</b> <i>Crotalus exsul</i>	Occurs in rocky areas & dense vegetation. Needs rodent burrows cracks in rocks or other surface material. Chaparral, woodland, grassland and desert areas. Coastal San Diego County to the eastern slopes of the mountains.	Year round	FED: C2* STATE: CSC	High. Suitable habitat exists throughout the project area.
<b>Birds</b>				
<b>White-tailed kite</b> <i>Elanus leucurus</i>	Open country in South America and southern North America.	Year-round	FED: ND STATE: ND (nesting)	Moderate. Property terrain may be too uneven for this species to forage.
<b>Bald eagle</b> <i>Haliaeetus leucocephalus</i>	Winters locally at deep lakes and reservoirs feeding on fish and waterfowl. Locally rare throughout North America.	Nov - Feb	FED: END STATE: END	Low. Species is known to winter at Big Bear Lake; during winter, could fly over site or perch in riparian woodland.

Table 2. Sensitive Biological Resources – Arrowhead Springs

Resource	Habitat And Distribution	Activity Period	Status Designation	Occurrence Probability
<b>Northern harrier</b> <i>Circus cyaneus</i>	Grassland and marshy habitats in Southern California. Uncommonly in open desert and brushlands.	Year round	FED: ND STATE: CSC	Present. Observed during the surveys. Forages over a wide range of open habitat and can be expected to occur throughout most of Southern California. Although no nesting habitat was found, some foraging habitat exists on site.
<b>Sharp-shinned hawk</b> <i>Accipiter striatus</i>	Nests in woodland, coniferous deciduous forest. Winter visitor and migrant to coastal Southern California. Forages over a variety of habitats.	Fall & winter; scarce in summers	FED: ND STATE: CSC	Low. Not observed during the surveys, but are expected to forage infrequently over the property during migration and in winter.
<b>Cooper's hawk</b> <i>Accipiter cooperi</i>	Woodland and semi-open habitats, riparian groves and mountain canyons. Uncommon permanent resident in coastal, mountains, and deserts of Southern California. Transients fairly common on coast in fall.	Year round; predominant in summer	FED: ND STATE: CSC	Moderate. Suitable nesting and foraging habitat exists within the project area.
<b>Golden eagle</b> <i>Aquila chrysaetos</i>	Grasslands, brushlands, deserts, oak savannas, open coniferous forests and montane valleys. Nesting primarily in rugged mountainous country. Uncommon resident in Southern California.	Year round diurnal	FED: ND STATE: CSC (nesting and wintering)	Low. Not observed during the surveys. Foraging habitat for this species exists over the entire property. No suitable nesting habitat occurs within the proposed development area. Some nesting habitat may be present along the broader canyon sides.

Table 2. Sensitive Biological Resources – Arrowhead Springs

Resource	Habitat And Distribution	Activity Period	Status Designation	Occurrence Probability
<b>Merlin</b> <i>Falco columbarius</i>	Frequents several habitats including coastal sage scrub and annual grassland. Forages along the coast, and in montane valleys and open deserts with scattered clumps of trees. Rare fall migrant and winter visitor to Southern California.	Fall & winter	FED: ND STATE: CSC	Low. Not observed during the surveys. Can be expected to forage over the site during migration and in winter. They are expected to use the area very infrequently.
<b>American peregrine falcon</b> <i>Falco peregrinus anatum</i>	Wetlands near high cliffs; few known to nest in urban settings on tall buildings. Scattered locations in North America; in California coastal areas and inland mountains.	Fall & Winter (in migration and as winter visitor)	FED: ND STATE: END	Low. Species passes through region during migration and may winter in region; during migration or winter, could fly over site, perch in riparian woodland, and/or forage in surrounding habitats including site.
<b>Prairie falcon</b> <i>Falco mexicanus</i>	Nest in cliffs or rocky outcrops; forage in open arid valleys, agricultural fields. Throughout the desert and arid interior portions of coastal counties. Uncommon resident in Southern California.	Year round diurnal	FED: ND STATE: CSC	Low. Not observed during the surveys. Foraging habitat exists for this species over the property, but there is no suitable nesting habitat.
<b>Burrowing owl</b> <i>Athene cunicularia hypugea</i>	Grasslands and rangelands, usually occupying ground squirrel burrows. Resident over most of Southern California. Found in agricultural areas.	Year round	FED: ND STATE: CSC	None. No suitable burrowing habitat exists within the project area. This species may forage on site and in adjacent areas.
<b>Long-eared owl</b> <i>Asio otus</i>	Rare resident in coastal Southern California and uncommon resident in desert areas. Dense willow-riparian woodland and oak woodland. Breeds from valley foothill hardwood up to ponderosa pine habitat.	Nocturnal year round	FED: ND STATE: CSC	Low. Foraging habitat exists on the property, but no nesting habitat.

Table 2. Sensitive Biological Resources – Arrowhead Springs

Resource	Habitat And Distribution	Activity Period	Status Designation	Occurrence Probability
<b>Black swift</b> <i>Cypseloides niger</i>	Rare and very local summer resident in the foothill canyons of mountains. Most birds arrive after May. Rare and irregular transient (mainly in spring) away from breeding areas, principally west of the deserts. Breeding localities include Santa Anita Canyon, San Gabriel Mtns., Fallsvale in Mill Creek Canyon, San Bernardino Mtns. And Tahquitz Creek, San Jacinto Mtns.	Spring - Fall	FED: ND STATE: CSC	Moderate. This species may be in the upper reaches of Waterman and East Twin Creek.
<b>California gnatcatcher</b> <i>Polioptila californica</i>	Coastal sage scrub; occurs only in cismontane Southern California and northwestern Baja California in low-lying foothills and valleys.	Year-round	FED: THR STATE: ND	None. No suitable habitat occurs on site.
<b>Loggerhead shrike</b> <i>Lanius ludovicianus</i>	Open fields with scattered trees, open woodland, scrub. Fairly common resident throughout Southern California.	Year round	FED: ND STATE: CSC	Moderate. This species may nest within the and may forage in this area in winter.
<b>Southern California rufous-crowned sparrow</b> <i>Aimophila ruficeps canescens</i>	Fairly common resident along the coast of California; breeds very locally on desert mountain ranges. Preferred habitat is slopes with sparse shrubs and open grassy areas intermixed. Coastal sage scrub is the most common plant community used.	Year round	FED: ND STATE: CSC	Moderate. Suitable grassland/scrub habitat mix exists within the project area.
<b>Mammals</b>				
<b>Western yellow bat</b> <i>Lasiurus xanthinus</i>	Found in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. Roosts in trees, particularly palms. Forages over water and among trees.	?	FED: ND STATE: ND	Low. This is a low elevation species that may occasionally use the palm trees on site.

Table 2. Sensitive Biological Resources – Arrowhead Springs

Resource	Habitat And Distribution	Activity Period	Status Designation	Occurrence Probability
Townsend's western big-eared bat <i>Plecotus townsendii</i> , two ssp.	Requires caves, mines, tunnels, buildings or other similar structures for roosting. May use separate sites for night, day, hibernation or maternity roosts. Found in all but subalpine and alpine habitats throughout California.	Year round Nocturnal	FED: ND STATE: CSC	Moderate. Because there are a few suitable roost sites in the project area, this species may roost on the property. It may also forage over the property if there are roosting sites such as caves in the nearby mountains.
Pallid bat <i>Antrozous pallidus</i>	Day roost in caves, crevices, mines and occasionally hollow trees and buildings. Night roosts may be more open sites, such as porches and open buildings. Hibernation sites are probably rock crevices. Grasslands, shrublands, woodlands and forest from sea level through to mixed conifer. Throughout Southern California.	Spring, Summer, Fall Nocturnal Hibernates in Winters	FED: ND STATE: CSC	Moderate. Because there are a few suitable roost sites in the project area, this species may roost on the property. It may also forage over the property if there are roosting sites such as caves in the nearby mountains.
Spotted bat <i>Euderma maculatum</i>	Found in the western North America from southern British Columbia to the Mexican border, at a small number of widely scattered localities. Habitats range from arid deserts and grasslands through mixed conifer forest up to 10,600 foot elevation. Prefers rock crevices in cliffs, also uses caves and buildings.	Spring, Summer, Fall Nocturnal Hibernates in Winters	FED: ND STATE: CSC	Moderate. Because there are a few suitable roost sites in the project area, this species may roost on the property. It may also forage over the property if there are roosting sites such as caves in the nearby mountains.

Table 2. Sensitive Biological Resources – Arrowhead Springs

Resource	Habitat And Distribution	Activity Period	Status Designation	Occurrence Probability
<p><b>California mastiff bat</b>  <i>Eumops perotis californicus</i></p>	<p>Historically from north-central California south to northern Baja California, eastward across the southwestern United States, and northwestern Mexico to west Texas and Coahuila (Hall, 1981; Williams, 1986). In California, most records are from rocky areas at low elevations where roosting occurs primarily in crevices.</p>		<p>FED: ND                      STATE: CSC</p>	<p>Moderate. Because there are a few suitable roost sites in the project area, this species may roost on the property. It may also forage over the property if there are roosting sites such as caves in the nearby mountains.</p>
<p><b>Big free-tailed bat</b>  <i>Nyctinomops macrotis</i></p>	<p>Found from northern South America and the Caribbean Islands northward to the western United States (Williams, 1986). In the southwestern U.S., populations appear to be scattered. Known breeding localities are in parts of Arizona, New Mexico, and Texas. Prefers rocky, rugged terrain. Roosts in crevices in high cliffs or rocky outcrops. Ranges up to 8000 foot elevation.</p>	<p>Nocturnal                      spring - fall                      Hibernates                      in Winters</p>	<p>FED: ND                      STATE: CSC</p>	<p>Moderate. Because there are a few suitable roost sites in the project area, this species may roost on the property. It may also forage over the property if there are roosting sites such as caves in the nearby mountains.</p>
<p><b>San Diego black-tailed jackrabbit</b>  <i>Lepus californicus bennettii</i></p>	<p>Variety of habitats including herbaceous and desert scrub areas, early stages of open forest and chaparral. Most common in relatively open habitats. Restricted to the cismontane areas of Southern California, extending from the coast to the Santa Monica, San Gabriel, San Bernardino and Santa Rosa mountain ranges.</p>	<p>Year round,                      diurnal and                      crepuscular                      activity</p>	<p>FED: ND                      STATE: CSC</p>	<p>Low. Scrub cover on this site may be too dense in normal years for this species to persist.</p>

Table 2. Sensitive Biological Resources – Arrowhead Springs

Resource	Habitat And Distribution	Activity Period	Status Designation	Occurrence Probability
<b>Los Angeles pocket mouse</b> <i>Perognathus longimembris brevinasus</i>	Prefers sandy soil for burrowing, but has been found on gravel washes and stony soils. Found in coastal scrub. Los Angeles, Riverside, and San Bernardino Counties.	Nocturnal; active late spring to early fall.	FED: ND STATE: CSC	Moderate. Suitable sandy soil habitat exists throughout the project area along the drainages.
<b>San Bernardino flying squirrel</b> <i>Glaucomys sabrinus californicus</i>	San Bernardino Mountains; historically in the San Jacinto Mountains. Mid to upper elevation coniferous forest plant communities. Mature, dense conifer forest, typically with white fir close to riparian areas. 5200 to 8500 feet in elevation.	Year round	FED: ND STATE: CSC Forest Service Sensitive Species	None. Canopy cover not suitable for this species. Species is known to occur nearby at higher elevations.
<b>White-eared pocket mouse</b> <i>Perognathus alticola alticola</i>	Dry, open pine forest with bracken fern. Sagebrush, and other shrubs in ponderosa and Jeffrey pine forests. Uncommonly in mixed chaparral and sagebrush habitats. Scrub or open scrub habitats on sandy soils.	Nocturnal; active late spring to early fall.	FED: ND STATE: CSC	None. Site does not contain suitable open areas within the pine forest habitat.
<b>Northwestern San Diego pocket mouse</b> <i>Chaetodipus fallax fallax</i>	Sandy herbaceous areas, usually with rocks or coarse gravel. Arid coastal areas in grassland, coastal scrub and chaparral. San Diego, San Bernardino, Los Angeles, and Riverside Counties.	Nocturnal; active year round.	FED: ND STATE: CSC	High. Suitable habitat exists throughout the project area in the grassland and scrub habitats.
<b>San Bernardino kangaroo rat</b> <i>Dipodomys merriami parvus</i>	Primary and secondary alluvial fan scrub habitats, with sandy soils deposited by fluvial (water) rather than aeolian (wind) processes. The preferred substrate appears to be sandy and sandy loam soils and very little herbaceous ground cover. In isolated populations along the Santa Ana and San Jacinto drainage systems.	Nocturnal; active year round	FED: END STATE: CSC	Low. Suitable alluvial scrub habitat exists throughout the project area along the lower sections of the drainages.

Table 2. Sensitive Biological Resources – Arrowhead Springs

Resource	Habitat And Distribution	Activity Period	Status Designation	Occurrence Probability
San Diego desert woodrat <i>Neotoma lepida intermedia</i>	Moderate to dense canopies, particularly in rocky areas. Coastal sage scrub and chaparral. Coastal southern California.	Nocturnal; active year round	FED: ND STATE: CSC	High. Suitable habitat exists throughout the scrub habitats of the project area.
Grasshopper mouse <i>Onychomys torridus ramona</i>	In the more arid regions of southern California. Especially prefers sandy areas of the Mojave and Sonoran deserts, and parts of the San Joaquin Valley. <i>O.t. ramona</i> does not have a precise habitat description.	Year round	FED: ND STATE: CSC	Low. Suitable habitat exists, but based on the preferred habitat, this species may be further east.
Nelson's bighorn sheep <i>Ovis canadensis nelsoni</i>	Prefers rugged terrain, and can be found from near the valley floor to the tops of desert mountain ranges. This particular race is found in desert ranges from the White Mountains south to Mexico. This species is also in the San Bernardino Mtns., and there is an isolated population in the San Gabriel Mountains.	Year round, seasonal elevation movement.	FED: END, DPS* STATE: THR  *A Distinct Population Segment in the Santa Rosa Mtns.	Low. Sheep probably are present in the vicinity of the property, but it is unlikely they would be present or use the developed areas of the site. They may occur in the upper reaches of Strawberry and East Twin Creek .
American badger <i>Taxidea taxus</i>	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils & open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	Year round. Seasonal appearance depending upon weather	FED: ND STATE: CSC	Low. May be present in higher reaches of Strawberry and East Twin Creek. Sighting from Running Springs.

**Invertebrates**

No sensitive invertebrates are expected to be present.

**Sensitive Habitats**

Riversidian alluvial fan sage scrub	Creeks, rivers, canyons and drainages in Peninsular and Transverse Ranges. Riverside, San Bernardino Counties.	Year round	Declining plant community	Marginally present in the lower reaches of Waterman Creek and East Twin Creek.
Southern mixed riparian forest	Steep canyons and drainages in the foothills of local mountain ranges.	Year round	Declining plant community	Not present.

**Table 2. Sensitive Biological Resources – Arrowhead Springs**

<b>Resource</b>	<b>Habitat And Distribution</b>	<b>Activity Period</b>	<b>Status Designation</b>	<b>Occurrence Probability</b>
Southern cottonwood willow riparian forest	Steep, narrow and shallow, broad canyons and drainages in the foothills of local mountain ranges.	Year round	Declining plant community	Not present.
Southern sycamore alder riparian woodland	Steep, narrow and shallow, broad canyons and drainages in the foothills of local mountain ranges.	Year round	Declining plant community	Present.

**Legend**

**FED: Federal Classifications**

- END Taxa listed as endangered  
THR Taxa listed as threatened  
PE Taxa proposed to be listed as endangered  
PT Taxa proposed to be listed as threatened  
C2\* The USFWS will continue to assess the need for protection of these taxa and may, in the future, designate such taxa as Candidates. NRA, Inc. has noted the change in species status by marking with an asterisk (\*) those C2 candidates that were removed from the list.  
C Candidate for listing. Refers to taxa for which the USFWS has sufficient information to support a proposal to list as Endangered or Threatened and issuance of the proposal is anticipated but precluded at this time.  
ND Not designated as a sensitive species

**STATE: State Classifications**

- END Taxa listed as endangered  
THR Taxa listed as threatened  
CE Candidate for endangered listing  
CT Candidate for threatened listing  
CFP California Fully Protected. Fully Protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock.  
CSC California Species of Special Concern. Taxa with populations declining seriously or that are otherwise highly vulnerable to human development.  
SA Special Animal. Taxa of concern to the California Natural Diversity Data Base regardless of their current legal or protected status.  
ND Not designated as a sensitive species

**CNPS: California Native Plant Society Classifications**

- 1A Plants presumed by CNPS to be extinct in California  
1B Plants considered by CNPS to be rare or endangered in California and elsewhere  
2 Plants considered by CNPS to be rare, threatened or endangered in California, but which are more common elsewhere  
3 Review list of plants suggested by CNPS for consideration as endangered but about which more information is needed.  
4 Watch list of plants of limited distribution whose status should be monitored.

**Occurrence Probabilities**

- Occurs Observed on the site during this study or recorded on site by other qualified biologists.  
Expected Not observed or recorded on site, but likely to be present at least during a portion of the year.  
High Known to occur in the vicinity of the project site. Suitable habitat exists on site.  
Moderate Known to occur in the vicinity of the project site. Small areas of or marginally suitable habitat exists on site.  
Low No reported sightings within the vicinity of the project. Available habitat limited and rarely used.  
None Focused surveys did not locate the species, or suitable habitat does not exist on site.  
Unknown No data is available on whether species is on or in the vicinity of the site, and information about the species is insufficient to make an accurate assessment of probability occurrence. distribution whose status should be monitored.