

UPPER SANTA ANA WASH LAND MANAGEMENT AND HABITAT CONSERVATION PLAN (WASH PLAN)

TRAILS MASTER PLAN

Prepared for
San Bernardino Valley Water Conservation District
November 16, 2016



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Section 1

Introduction

The 5,000-Acre Upper Santa Ana Wash Plan Area is a preserve (Preserve) with multiple uses including habitat protection and enhancement, land conservation, water management, quarry/mining activities, and is now undergoing permitting review for trail use. The intersection between trail use and resource management are the focus of this Trails Master Plan document. This plan is based upon a Concept Trails Plan adopted by the San Bernardino Valley Water Conservation District Board of Directors in August, 2015 and provides greater detail, as well as, addresses potential strategies for plan implementation.

The Preserve will provide local and regional recreational benefits with educational and interpretive opportunities featuring the unique species and habitats found in the Santa Ana Wash Plan Area. Other Trails Master Plan considerations include: Health, safety, and accessibility for visitors; trail access and internal circulation that protects sensitive habitat and wildlife; connections to other local and regional pedestrian and multi-use trails and paths; public safety in proximity of continuing San Bernardino Valley Water Conservation District (SBVWCD) water management and quarry operations; design guidelines; regulatory compliance; governance, operations and maintenance; and implementation.

Regulatory compliance for the Trails Master Plan is linked to the Upper Santa Ana Wash Habitat Conservation Plan (Wash Plan), a regulatory planning document that provides evaluation of and protocol for protection of listed species and their habitats within the plan area. In accordance with the Wash Plan, the Trails Master Plan describes trail usage as being strictly limited to existing roads and access easements to avoid impacts to sensitive habitat areas. Extraneous side trails will be converted to open space and habitat enhancement areas.

Resource protection as well as recreational and enforcement activities within the Preserve will be similar to those found in National Parks. There will be a high level of resource protection due to endangered species, threatened species, and species of concern. Some species such as the endangered San Bernardino kangaroo rat, do not exist anywhere else in the world. These and other unique species are described in this Trails Master Plan. Habitat areas have been mapped and potential trail types and allowable uses have been identified to avoid potential habitat disruption.

Management strategies for National Parks balance recreational opportunities with stewardship of natural and cultural resources. Recreational activities at National Parks are restricted by type to specific areas and trails in order to provide a high level of resource management protection. For example, dogs on leash are allowed on dirt roads, but not on trails. Dogs are never permitted off-leash in any areas within National Parks. Similarly, dogs will not be permitted off-leash in any areas within the Preserve to prevent disruption to endangered and protected species and habitat areas within the Preserve.

National Parks limit access points and provide parking areas limited in size and location to be consistent with site specific trail planning, park capacity, and facility objectives and design. Similarly, the Preserve Area's trail plan, capacity, and design will dictate access points and restrict parking (e.g., no onsite parking within the habitat areas), to provide resource management protection.

The proposed trail crossing of the Santa Ana River Woolly Star Preservation Area (WSPA) to connect to the Santa Ana River Trail (SART) in Redlands is not a Covered Activity in the Wash Plan. Approval of the WSPA crossing will require independent Wildlife Agency approval. The WSPA crossing is discussed in this Trails Master Plan in order to provide a full description of activities contemplated in the Plan Area.

In accordance with the Wash Plan, this Trails Master Plan includes guidance for:

1. Patrol section which details the type and frequency of patrols including periodic patrols of the area by law enforcement personnel;
2. Local ordinance(s) prohibiting unauthorized off-trail travel, providing provisions for temporary or permanent trail closures in the event of resource damage, unsafe conditions, and providing enforcement authority for violations;
3. Sign plan with informational, interpretive, regulatory and directional signs;
4. Access section including barricades, gates and/or fencing to deter motorized and other unauthorized uses, protect trail users from physical hazards, and protect sensitive habitat areas from all traffic, and plans for informational kiosks/signs at trailheads to inform visitors about safe and appropriate trail use;
5. Trail maintenance plan and schedule detailing the frequency and methods of trail maintenance;
6. Vegetation management plan to address the potential spread of invasive species and overgrowth along the trail route and enhancement of sensitive species habitat.
7. Long-term funding section including a non-wasting endowment for the operation and maintenance of the trail system; and
8. Measures to address any resource damage caused by on or off trail use or flood debris. The Trails Master Plan will detail public safety considerations associated with operating a trail system in an isolated area subject to flash flooding and other potential physical hazards. All trails will be intended for access by only bicyclists and pedestrians and will be located on or along existing streets, service roads, or old railroad beds. No new ground disturbance is permitted. Off-trail



travel and domestic animals will be prohibited or limited to select areas. No off-road vehicles would be permitted on trails. Recreational off-road vehicle use is not a Covered Activity in the Wash Plan.

Use of the Preserve for trail activities will likely require staging areas which are assumed to be outside project boundaries in order to provide resource management protection. Trails segments whose designation and maintenance are conditionally covered in the Wash Plan include:

- Alabama Street Trail (High.13)
- Borrow Pit South Rim Trail (Redl.06)
- Boulder Avenue / Orange Street Trail (High.14)
- Cone Camp Road Trail (High.15)
- Greenspot Road Trail (High.16)
- Old Rail Line Trail (High.19)
- Plunge Creek Trail (High.20)
- Pole Line Trail (High.21)
- Weaver Street Trail (High.22)
- Santa Ana River Trail (Redl.09)
- Alabama Street Trail (Redl.16)
- Orange Street Trail (Redl.17)
- Greenspot Road Trail (Redl.19)

1.1 Purpose of the Trails Master Plan

The purpose of this Trails Master Plan is to develop a framework for creating an integrated system of pathways that will link the residents of the Cities of Highland and Redlands and provide access to the outdoors while providing essential habitat preservation and enhancements for threatened and endangered species as part of the implementation of the Wash Plan. The extension of the Santa Ana Trail westward along the southern boundary of the Preserve will provide a link to further the ultimate goal to connect Huntington Beach on the Pacific Ocean to Big Bear Lake along the length of the Santa Ana River for a total of 110 miles. Multiple other trails within the Preserve are intended to serve local users and connect to other trails within the



communities of Redlands and Highland. This Trails Master Plan contains detailed trail corridor recommendations and guidance in the creation of an interconnected network of trails that utilize current traveled ways while minimizing further disruption to the ecosystem. The system of trail networks described in this Trails Master Plan creates the opportunity to enhance recreational opportunities for a variety of user groups and to improve the quality of life for our cities.

1.2 Benefits

1.2.1 Healthy Lifestyles

Trails can provide meaningful and satisfying outdoor experiences while providing accessible, low-cost opportunities to meet physical activity needs. Studies show that walking or hiking a few times per week can improve a person's physical and mental health. Recreational activity can help reduce depression by providing an enjoyable activity for users to look forward to. Use of trails for recreational activities including walking, jogging, and bicycling benefits the health of all age groups. Another benefit of physical fitness includes reductions in direct and indirect costs of illness and disease. Many of the most livable communities in the country put an emphasis on trails and recreation, and promote the positive health benefits provided by their use. Trails designed to meet the Americans with Disabilities Act (ADA) and/or Architectural Barriers Act (ABA) guidelines provide recreation opportunities for all ages and all abilities.

1.2.2 Economic Benefits

An organized and well-managed trail system is a desirable city amenity that can contribute to a community's economic vitality. Like parks, properly designed trails can enhance the property values of surrounding properties and provide potential alternative commuting and travel options. Trails can also generate visits from members of neighboring communities, and can create positive economic benefits to businesses in the local community.

1.2.3 Alternative Transportation

Studies show that 50 percent of all car excursions are less than three miles, a distance that can easily be walked or biked. Trails increase transportation options for all members of the community, providing safe transportation options for those without a driver's license. A network of trails can enhance transportation systems in the cities of Highland and Redlands by providing an alternative means to workplaces, parks, stores, and other destinations that are located near local trails. For example, both Orange Street (Boulder Avenue in Highland) and Alabama Street are major connections between the two cities. Greenspot Road provides transportation to and from Boulder Avenue & Alabama Street/Palm Avenue on the Highland side. Finally, Cone Camp Trail will create an unpaved connection that would connect Cone Camp Road in Highland to Opal Avenue in Mentone.



Likely Destinations for Trail Users:	Accessible Through:
Citrus Plaza (Redlands)	Alabama Street
Redlands Shooting Park (Redlands)	Orange Street / Boulder Avenue
Hangar 24 (Redlands)	Cone Camp Trail
Beattie Middle School (Highland)	Greenspot Road & Boulder Avenue
Shopping Plaza (Greenspot Rd & Church Ave in Highland)	Greenspot Road
Aurantia Park	Greenspot Road
Golden Triangle Development Area	Orange Street / Boulder Ave
Orange Blossom Trail	Pole Line Trail
Downtown Mentone	Cone Camp Trail
Model Airplane Airport	Borrow Pit/ Greenspot Road
Redlands Airport and Annual Airshow	Cone Camp Trail
The Village at East Highlands	Greenspot Road
Citrus Valley High School	Orange Street Trail
Mountain Grove Shopping Center	Alabama Street
Redlands East Valley High School	Cone Camp Trail

1.2.4 Public Education

With the continual expansion of urban areas and development of electronic diversions, our younger generations are becoming less exposed to the environment. Trails provide a wonderful opportunity for outdoor education. Trails play an important role in building public commitment to environmental conservation. Meaningful outdoor experiences can reaffirm one's sense of connection to and appreciation of the natural environment. Closing environmentally sensitive areas completely to the public for conservation purposes creates an image of rejection to the public and minimizes the opportunity for first hand education. Instead, we can create peripheral connections to the environment that permit visitors to view ecosystems and habitat first hand, while providing protection to those areas. Educated visitors will share their knowledge of local resources and unique flora and fauna with others.



As an educational tool, trail signage can be designed to inform trail users about environmental issues particular to the local environment including: Essential breeding, nesting, rearing, and other important life cycle events of animals; microclimates critical to plants; and the impact of man, vehicles, and domestic animals on these fragile environments, as well as the introduction and impact of invasive species on the environment. The

signs provide guidance on how to help conserve our environment and why it is important to do so. It is important to inform users that habitat loss—due to destruction, fragmentation or degradation of habitat—is a primary threat to the survival of wildlife. When an ecosystem has been dramatically changed by human activities, impacts are often irreversible. The public must be notified of the presence of endangered species and provided with the tools to be able to identify and not disturb them, particularly during sensitive life cycle times. Protection of the Preserve’s biological resources, inclusive of threatened and endangered species and their native habitats will promote environmental stewardship of these unique natural resources and cultural heritage.

Interpretive signage can also describe cultural and historical resources, watershed features, and unique geologic and hydrologic formations of the Preserve to create a sense of place. Signage also presents important safety information, visitor regulations, and wayfinding information.

1.2.5 Social Benefits

Trails foster community involvement and pride, in addition to providing an opportunity for interaction with people of varying backgrounds and experiences. California is a richly diverse state, with more cultures and languages than any other state in the nation. Trails can promote positive contact between different ethnic groups and open communication in a nonthreatening atmosphere. People in such activities become less concerned with differences and more concerned with having fun and enjoyable experiences. It also creates an opportunity for families and neighbors to recreate together, which can encourage a safe, lively community atmosphere. Communities that recreate together tend to be closer and more cohesive. By participating in activities together, communities also elicit feelings of loyalty, teamwork, and goodwill.

1.2.6 Environmental Benefits

The local area is known to have some of the highest air pollution levels in the country. The alternative transportation options provided by this trails system can help reduce vehicle exhaust emissions that pollute our air. Although specific locations within the Upper Santa Ana Wash Land have been heavily impacted by man over the years, the area currently provides exceptional habitat and resource values, especially rare Riversidian alluvial fan sage scrub habitat.

Climate change is a concern due to anticipated temperature and precipitation rates. As part of the San Bernardino Valley Water Conservation District, the preserve will provide opportunities to describe: the hydrology of the wash area; the mission of the Conservation District, including the water recharge program and recharge areas; and a description of the historic seasonal flooding and sediment deposition that occurred prior to the Seven Oaks Dam flood control structure.

Creation of the preserve provides an opportunity to reclaim some areas no longer actively used by man, and restore habitat through historic activities and previous flood events. Excavation and material transport still occur within areas of the site boundary as part of the activities of the Water Conservation District. Trail plans must



address safety and environmental impacts related to these activities.

1.2.7 Heritage Benefits



Trail corridors help to preserve historical and cultural resources associated with a local community. The preservation and commemoration of these types of historical structures creates a sense of place and a sense of identity for the community while enlightening visitors. The Wash has a rich and varied history dating back beyond the date of the first Spanish explorers, through the boom years of orange production, to today. Documentation of past peoples, activities, and remnants of historic structures and sites help us to understand and share our rich heritage with others.

1.3 Vision

The vision for the proposed trail network is derived from local residents, the District, and the surrounding areas' city staff. A fundamental part of that vision is that the trail network will contribute to the overall quality of life throughout the cities of Redlands and Highland. Given the benefits of a trails system outlined in the previous section, specific visions and goals for the Trails Master Plan include the following:

- Develop a safe, accessible, and interconnected region-wide network of trail facilities that link together destinations and people.
- Improve quality of life in local areas by developing a trail network that provides facilities and programs designed to expand and encourage active recreation, community strength, and alternative transportation.
- Enhance, protect, and preserve the environmental quality of open space, waterways, and wildlife habitats.
- Conserve local culture, history, and heritage through interpretative trails and signage.

Section 2

Existing Environment

This section describes the existing roads (58.2 acres) that would be designated for use as recreational trails within the 5,000 acre Wash Plan area. Existing access ways within the area include existing established roadways connecting communities, paved access ways for access to Conservation District Operations and other earthwork activities, crushed stoned or gravel roadways, former rail beds, and utilities corridors. These ways may include overhead power lines or underground utilities requiring regular maintenance and access.

2.1 Setting

The trails system would be located within the Wash Plan Area. This area is located at the base of the San Bernardino Mountains in an area created by periodic flooding of the Santa Ana River, Mill Creek, and Plunge Creek. In the past, these waterways were not channeled and large flows during the mid-1800's created the wash surface and determined the location of present channels. In times of heavy rainfall, water flowed from local mountains through the creeks and the river, and combined to create a fast-moving, turbulent river with high sediment load. When rainfall subsided, and the river and creeks returned to their smaller courses, it left large areas between the waterways consisting of rock, debris, and sediment, thus creating this area. This area is comprised of sandy alluvial soils and vegetated with alluvial scrub species. It provides ideal habitat for a number of rare and endangered species identified elsewhere in this document.



2.1.1 Cone Camp

Within the Wash Area, we can find the remains of a camp erected to house the Bracero Program workers. The Bracero Program was a series of laws and diplomatic agreements for the importation of temporary contract laborers from Mexico to the United States that ran for 22 years, from 1942 to 1964. The camp was erected in the debris cone formed by the Santa Ana River where the river exits the San Bernardino Mountains, and thus became known as Cone Camp, or the Highland-Redlands Labor Association. At the height of the program, over 1,000 workers were served. Busses transported the laborers to the groves and vineyards. By 1974, the area citrus industry was in decline, reducing the need for large numbers of field workers. Time, fire, and termites further decimated the camp. In February of 1977, the camp became the site of S.W.A.T. and "Burn to Learn" exercises. While Cone Camp was reportedly a model for other camps, not all the workers were happy with their situation, complaining of poor food and withheld wages. A good number remained here, marrying local girls and continuing their lives in this area. But, for now, an inconspicuous street sign is the only reminder of our huge citrus

industry and those workers who supported it during a time of national labor shortages resulting from World War Two and beyond. Within the Cone Camp trail, we can educate users about the history of our local agriculture and community.

2.2 Existing Trails and Possible Connections

A number of existing roads and rights of way exist that minimize or eliminate the need for creation of newly blazed trails. The surfaces of these vary and are expected to provide suitable surfaces for various trail types identified elsewhere in this document. Consistent with the intent to protect and enhance habitat where possible, utilization of these existing ways will provide an opportunity to access multiple locations within the reserve and reduce the scars left behind from the historic use through mitigation and environmental restoration. As previously noted, material extraction is currently performed in portions of the reserve. The interface with these haul roads near the borrow pit will require traffic controls which may include signalization, signage, specialized lane markings, and/or travel restrictions for commercial and recreational use.



The existing paths and streets that can be used for a trails system include:

- The maintenance roads that are located within the Wash Plan Area
- Abandoned rights-of-way that are located within the Wash Plan Area
- Existing rights-of-way that are located within or around the Wash Plan Area
- Planned paved paths located within or around the Wash Plan Area



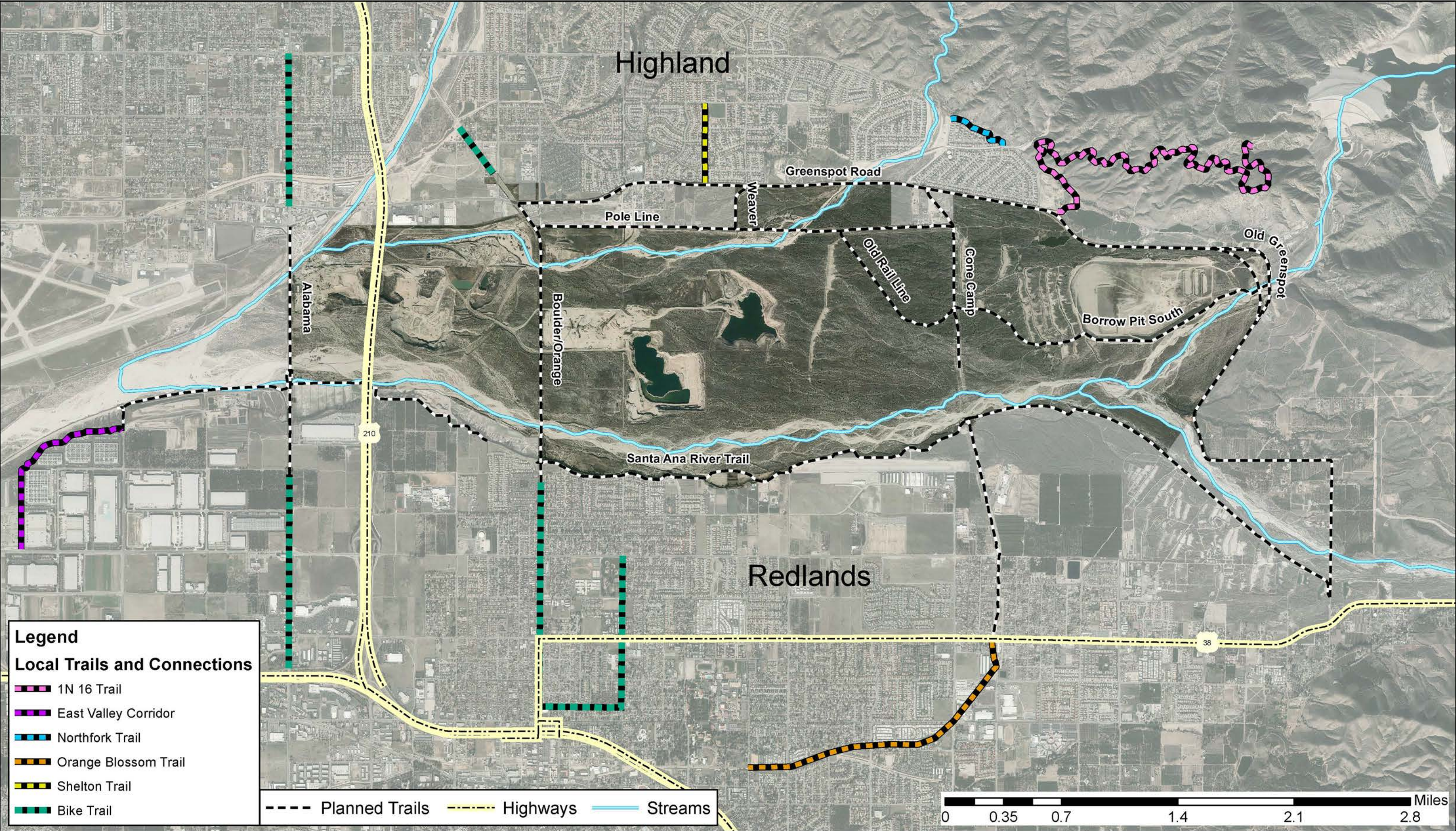
2.3 Links to Local Trail Systems

The proposed trails network would link to already existing trails in the cities of Highland and Redlands.

- The Shelton Trail branches out north from Greenspot Road, as well as the 1N 16 Trail.
- The Northfork Trail is about one-third of a mile north of Greenspot Road.
- The East Valley Corridor Trail extends north into the Santa Ana River Trail.
- There are bike lanes that continue north into Highland from Orange Street and Alabama Street.
- There are sidewalks that extend south on Orange Street into Redlands.
- Both Alabama Street and Cone Camp Trail continue as streets south of the Wash Plan Area.

Figure 2-1 Proposed Trails Network and Existing Trails

Coordinate System:
NAD 1983 StatePlane California V FIPS 0405 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Source: SBVWCD GIS
GIS Contact: Jennifer Zhou
November 3, 2016



2.3.1 Santa Ana River Trail

An extension of the Santa Ana River Trail (SART), a significant regional trail system linking the Pacific Ocean with the San Bernardino Mountains planned to extend 110 miles, is planned on the southern border of the Plan Area. Portions of the SART pass outside the southern border of the project site as is reflected in the General Plans of Highland and Redlands. The SART extension through the Plan Area would intersect two of the Preserve trails, the proposed Orange Street-Boulder Avenue Trail on the south side of the Santa Ana River, and the proposed Greenspot Road Trail east of the project boundary, as well as, allow access to the Cone Camp Road Trail. Additionally, the SART will provide linkage to the Orange Blossom Trail through Mentone and south into Redlands.

Unlike the other potential trails in the Preserve which would utilize existing dirt roads, portions of the SART extension would be new trail with permanent impacts to covered species habitat. Also, because the SART is a heavily used multi-use trail, i.e., hikers, bicycles, and horses, a post and cable barrier or equivalent will be constructed between the SART and the Preserve to reduce the potential for unauthorized trail use in the Preserve. The fence design must be approved by the Wildlife Agencies. Signage identifying the sensitive nature of the preserve will be critical in this area and special enforcement measures may be warranted to minimize intrusion by visitors. These costs will be borne by the lead agency constructing the SART.

Connections between the SART and Preserve trails would require approval by the Wildlife Agencies as described above.

The routing of the Santa Ana River trail within the Plan Area would be subject to the General Avoidance and Minimization Measures found in Section 5.4 of the Wash Plan, and a management plan sufficient to ensure the protection of the Preserve will need to be developed by the County of San Bernardino or other managing entity and approved by the Wildlife Agencies. A trail crossing of the Santa Ana River and the WSPA is envisioned by trail planners. This potential crossing is not covered by the Wash Plan.

As noted above a trail crossing of the Santa Ana River and the Santa Ana River Woolly Star Preservation Area (WSPA) is envisioned by trail planners to connect to the Santa Ana River Trail in Redlands. This potential crossing is not covered by the Wash Plan. The envisioned trail would cross the WSPA at Cone Camp Road and would be subject to relevant or applicable authorities and approvals. It is recognized here only to provide a full description of activities contemplated in the Wash Plan Area.

The Santa Ana River Trail will connect this network of trails to the following cities:

- Loma Linda
- Colton
- San Bernardino
- Riverside
- Corona
- Norco
- Yorba Linda
- Orange
- Anaheim
- Santa Ana
- Fountain Valley
- Huntington Beach



2.4 Existing Environment and Habitat

Approximately 638 acres of land within the 5,000 acre Planning Area are located within BLM ACEC's (Area of Critical of Environmental Concern) and RNA's (Research Natural Areas), which are areas where natural conditions are to be maintained as much as possible. These areas are described in the Wash Plan document.

The Upper Santa Ana Wash has been created by floodwaters from the San Bernardino Mountains. Years of flooding has created sandy alluvial deposits which provide ideal habitat for several federally protected species. The geography is generally a flat outwash vegetated with alluvial scrub growth. This flooding and associated sediment deposition is now held in check by the construction of the Seven Oaks Dam.

The Upper Santa Ana Wash is the primary habitat for the Santa Ana River woolly star, slender-horned spineflower, San Bernardino kangaroo rat, coastal California gnatcatcher, and other species deemed critical by BLM.






Breeding and seed producing times for these species must be considered in the management of the Preserve. To comply with the Endangered Species Act, disturbance resulting from recreational uses should be kept at a minimum during critical times to ensure continuance of the species. It is important to keep in mind that environmental restoration is to be considered a part of this project. Mitigation will be required within the trails system to lessen the impact on our environmental treasures,

which are discussed in the Design Section of this Plan. Mitigation may include reduction of current disturbance, or prevention of intrusion into critical habitat areas. Planning for the Preserve must include a long-term protection plan for these species.



Within the Wash Plan Area is the Santa Ana River Woolly Star Preservation Area. The WSPA was established as part of the mitigation for the construction of the Seven Oaks Dam. It is an overlaying area in which natural conditions are to be maintained and enhanced as much as possible to preserve the Santa Ana Woolly Star.¹

¹ http://upload.wikimedia.org/wikipedia/commons/9/93/Seven_Oaks_Dam.jpg

2.5 Endangered and Protected Species

Description	
Santa Ana River Woolly Star	<p>The Santa Ana River Woolly Star (SARWS), <i>Eriastrum densifolium</i> ssp. <i>sanctorum</i>, is an endangered wild flowering plant of the Riversidian Alluvial Fan Sage Scrub community that is found on the higher elevation flood plain terraces of the Santa Ana River and its tributaries. Its branching woody stems grow 10 to 30 inches tall from the base and contain profuse leaves that are gray-green in color. Large blue-lavender flowers form slender tubes that radiate open at the top and cluster in groups of about 20 per flowerhead. The SARWS blooms annually from late May to mid-August but peaks in June. It has been listed as an endangered species by the California Fish and Game Commission since September 28, 1987.</p> 
San Bernardino Kangaroo Rat	<p>The San Bernardino Kangaroo Rat (SBKR), <i>Dipodomys merriami</i> spp. <i>parvus</i>, is an endangered species of rodent belonging to the Heteromyidae family. The physical description of this particular species is similar to other kangaroo rat species; large hind feet, long tail, cheek pouches, etc. but are generally darker and smaller than the other two subspecies in Southern California. They breed once a year, usually between January and late November and produce a litter of two and three young. The SBKR inhabits alluvial fans and flood plains with large populations near the Santa Ana River, Lytle and Cajon Creek and the San Jacinto River. Originally the SBKR's range included 320,000 acres but as of 1998 it only encompasses approximately 3,247 acres. It has been listed as an endangered species by the U.S. Fish and Wildlife Service since January 27, 1998.</p> 
Coastal California Gnatcatcher	<p>²The Coastal California Gnatcatcher (CCG), <i>Poliophtila californica</i> spp. <i>californicus</i>, is a small insectivorous bird that grows up to 4.25 inches long. The CCG is listed as a threatened species under the Endangered Species Act (ESA) and inhabits the coastal sage scrub of Southern California and Mexico. Coastal sage scrub makes up a significant amount of vegetation within the flood plain of the Santa Ana River and the District's land. Urbanization has dramatically decreased their numbers due to the removal of coastal sage scrub; in 1997 no more than 2,900 pairs were documented to be left in the U.S. The male and female are both a dusky gray-color but vary in terms of the color of their crown with the male having a black crown and the female having a blue-gray crown. The CCG was placed on the ESA in 1993.</p> 

² http://www.prbo.org/calpif/htmldocs/species/scrub/california_gnatcatcher.html

Description	
Slender-horned Spineflower	<p>The Slender-horned spineflower, <i>Dodecahema leptoceras</i>, is a dicot in the family Polygonaceae and is endemic to California. Specifically, it inhabits alluvial-fan habitats in Chaparral and Coastal Sage Scrub communities. The Slender-horned Spineflower has been documented within the District's Santa Ana River Spreading Facility. In 1997 it was ranked by the California Native Plant Society as extremely rare. During the same year it was also listed as an endangered species by both the state of California and the Federal Government.</p> 
Cactus Wren	<p>The Cactus Wren, <i>Campylorhynchus brunneicapillus</i>, is a species of wren that is native to the southwestern United States and central Mexico. The cactus wren is the largest North American wren, measuring 18–23 cm (7.1–9.1 in) long. The cactus wren is easily visible, unlike smaller wrens, and has the loud voice characteristic of a wren. They are found in deserts and arid foothills that have cactus, mesquite, yucca and other types of desert scrub. The cactus wren is not currently listed as endangered or threatened. However, it is protected by the Migratory Bird Treaty Act like all songbirds.³</p> 

³ <http://www.wildphotosphotography.com/WildPhotos/birds1/cactus%20wren.jpg>

Section 3

Proposed Trail Network

3.1 Trail Perimeters

The proposed trail network provides opportunities for visitors to observe and learn about endangered and protected species and habitat, historic features of Cone Camp, and water resource management. In order to provide visitor safety as well as endangered species and habitat protection, visitors must be restricted to trails throughout the Preserve. Off trail use whether by pedestrian, domestic animal, bicycle, vehicle or horse traffic degrades habitat, burrows, soil structure and vegetation may result in take of Wash Plan covered species. Trail perimeters will be designed to be compatible with the needs of native flora and fauna.

3.2 Trail Type Descriptions

3.2.1 Class 1

Class 1 trails (dedicated bikeways, paved bike paths) provide a completely separate five to eight foot wide right-of-way for the exclusive use of bicycles and pedestrians with cross flow by motorists minimized. These trails would be developed to Caltrans standards as published in the Highway Design Manual (Class I Bikeway). Construction of these trails is covered activities within the Wash Plan to be constructed by the Cities of Redlands and Highland, often within the existing road easement. Class 1 trails may also occur at the Santa Ana River.

3.2.2 Class 1/1-B

Class 1/1-B trails are shared used and will accommodate hiking, non-motorized bicycle use, and maintenance vehicles. Trails are approximately 10 to 12 feet wide and are either unpaved or composed of unmaintained degraded pavement. There is no plan to replace the pavement on these trails. Instead, over time, they will be returned to a soil-based trail tread. These trails may be also classified as Class 4 trail, however, they do have significant vehicle traffic. The City of Highland may choose to add Pole Line Road to this class of trails, however, this project would require an amendment to the Wash Plan and additional mitigation. Class 1/1B Trails may occur at the following:

- Borrow Pit South Rim
- Cone Camp Road
- Old Greenspot Road (and Horse Trails)

3.2.3 Class 2

Class 2 trails/lanes (paved bikeways in street right-of-way) provide a striped lane for one-way bicycle travel on a street or highway. Class 2 trails are located along the side of and within the paved cross-section of the roadway and are intended for nonmotorized traffic. There would typically be a bikeway on both sides of the street to facilitate bicycle traffic going in each direction. Construction of these trails are covered activities within the Wash Plan to be constructed by the Cities of Redlands and Highland, often within the existing road easement. As applicable, this bikeway would be developed to Caltrans standards as published in the Highway Design Manual (Class II Bikeway). Class 2 Trails may occur at the following:

- Alabama Street
- Boulder Avenue/Orange Street
- Greenspot Road

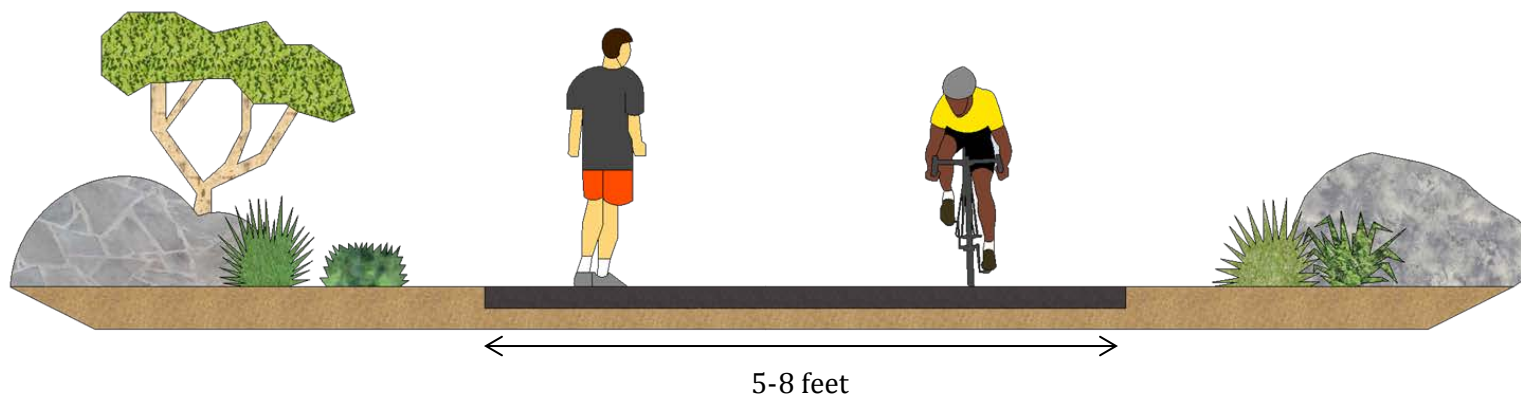
3.2.4 Class 4

Class 4 trails (unpaved multi-use) trails accommodate certain types of trail activities, including horses, bicyclists, hikers, and maintenance vehicles. The trails would not normally be paved and, in most cases, they would align with existing maintenance roads and/or abandoned railroad beds. Some paving may be required to keep users on the trail when nearing critical habitat areas. In the Planning Area, multi-use unpaved trails avoid impacts to endangered species and habitat through design (e.g., physical barriers such as large boulders, vegetation, and fencing) and patrol/enforcement measures. Class 4 Trails may occur at the following:

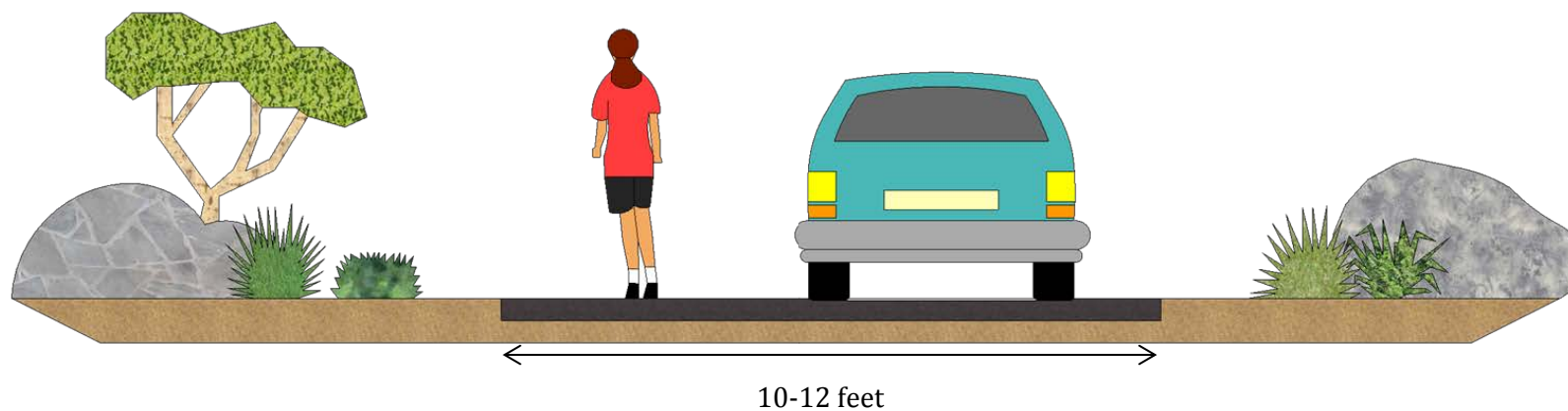
- Borrow Pit South Rim
- Old Rail Line
- Pole Line
- Weaver
- Cone Camp Road

3.3 Types Diagrams

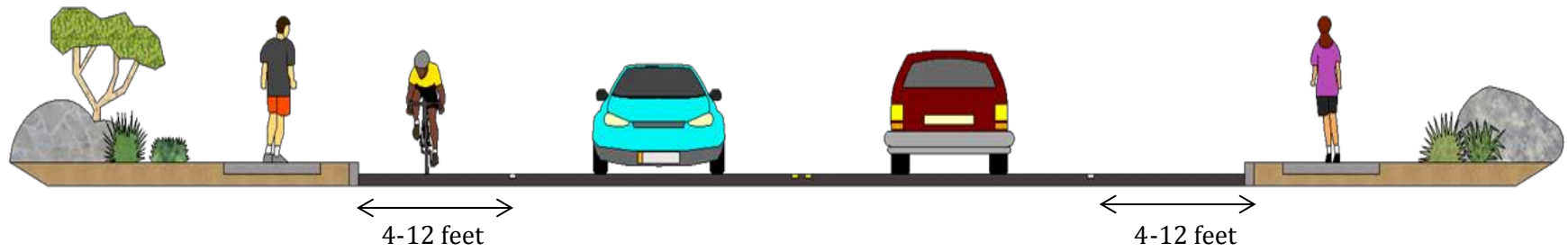
Class1



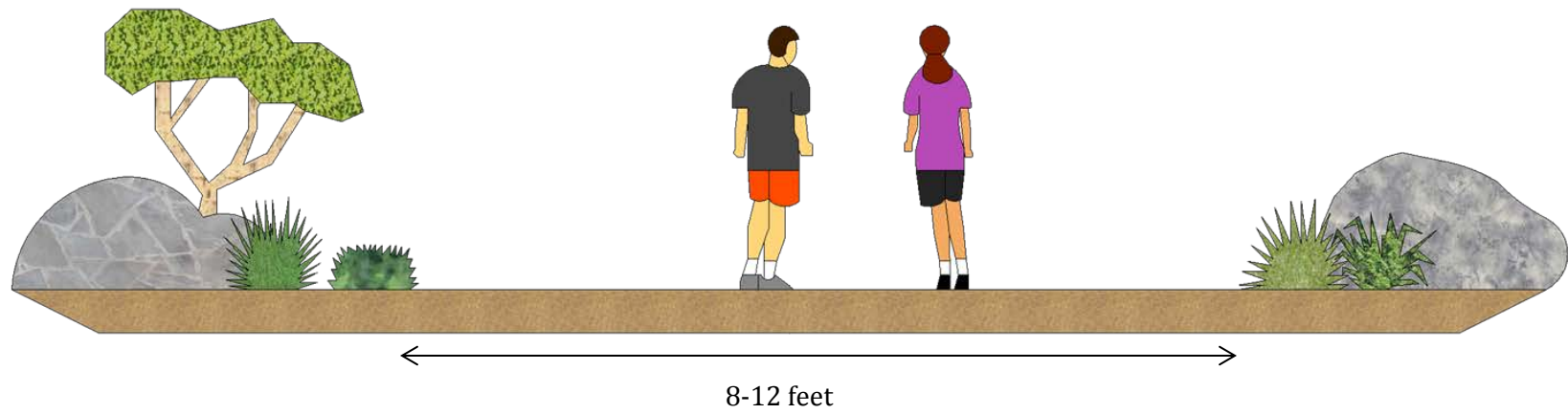
Class 1/1-B





Class 2






Class 4



3.4 Types of Users

Types of Users		Description	Design Needs	Amenities
Pedestrians		<ul style="list-style-type: none"> •Walkers •Hikers •Joggers •Dog Walkers •Bird Watchers 	Pedestrians tend to have fewer design requirements than other users. Most prefer softer surfaces to lessen impacts on their knees, though some users, such as power walkers and those pushing strollers may prefer more compact surfaces. The minimum recommended width is six to eight feet and the vertical clearance is eight feet.	<ul style="list-style-type: none"> •Signage •Waste-Bag Dispensers •Trash Bins
Bicyclists	 4	<ul style="list-style-type: none"> •Recreational Cyclists •Commuting Cyclists •Touring Cyclists 	The AASHTO Guide for the Development of Bicycle Facilities is viewed as the national standard for bikeway design. Bicyclists prefer hard surfaces and require a vertical clearance of at least eight feet, with 10 feet needed for overpasses and tunnels. Adequate sight distances for cyclists are critical for user safety; AASHTO recommends that multi-use trails provide a minimum sight distance of 150 feet. Ideal grades for bicyclists, over long distances, are less than three percent (typical for old railroad beds), although up to five percent is acceptable. The Caltrans Guidelines can be used as well, which are very similar to AASHTO guidelines.	<ul style="list-style-type: none"> •Signage •Trash Bins

⁴ <http://riversideca.gov/publicworks/traffic/bicycleprogram/images/redjersey.jpg>

Types of Users		Description	Design Needs	Amenities
Mountain Bikers	 5	<ul style="list-style-type: none"> Mountain Bikers (considered a separate user group as they tend to seek out more challenging trails with steeper grades and uneven surfaces) 	Mountain bikers make up a large segment of the bicycling population. Mountain bikers will be allowed on certain designated bike trails within the Preserve.	<ul style="list-style-type: none"> Signage Trash Bins
Inline Skaters	 6	<ul style="list-style-type: none"> Inline skaters 	Multi-use trails that accommodate pedestrians and bicyclists are likely to attract inline skaters as well. Inline skaters require the same trail width (minimum of 10 feet) and hard surfaces as bicyclists, and the same vertical clearance as pedestrians (seven feet). Inline skaters are more likely to be allowed on paved road trails.	<ul style="list-style-type: none"> Signage Trash Bins
Equestrian		<ul style="list-style-type: none"> Horseback Riders 	Hard surfaces (asphalt and concrete) and coarse gravel can injure horse hooves, so equestrians prefer loose or compacted dirt trails. A softer, separate five-foot-wide tread for horses alongside the main path is recommended if designed in combination with a paved path. Vertical clearance should be at least 10 feet, with a horizontal clearance of at least five feet.	<ul style="list-style-type: none"> Signage Trash Bins

⁵ <http://kemptonexpress.sites.caxton.co.za/wp-content/uploads/sites/30/2014/07/Mountain-Bikes.jpg>

⁶ <http://www.findseedo.com/spskating.jpg>

3.5 Trail Conditions

3.5.1 Maintenance

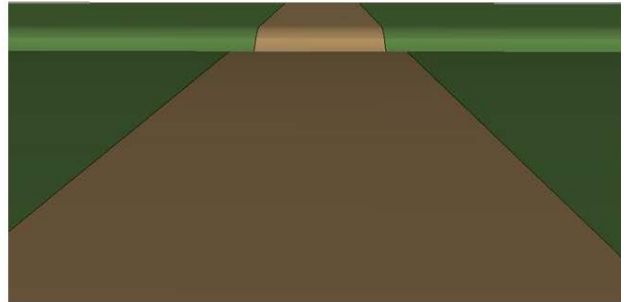
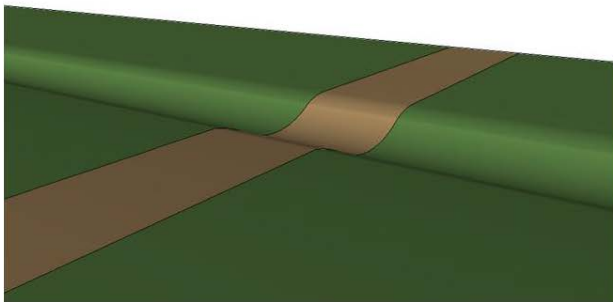
Trails that occur on or adjacent to streets will likely require occasional cleanup of debris and sediments from passing vehicles to maintain a safe travel surface. Crushed stone, gravel and earthen trails will require occasional grading to repair ruts, depressions, and wear patterns that occur through use or as a result of flood events. Disrupted trail edges and barriers must be repaired to provide visitor safety and endangered species and habitat protection.



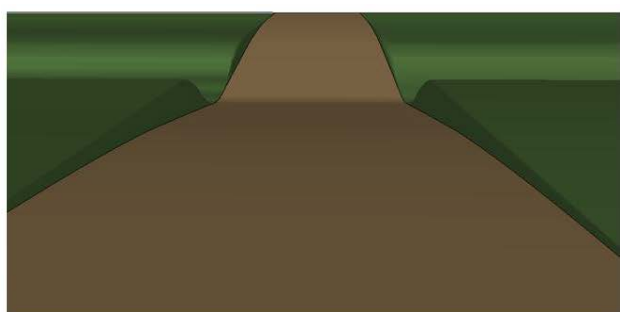
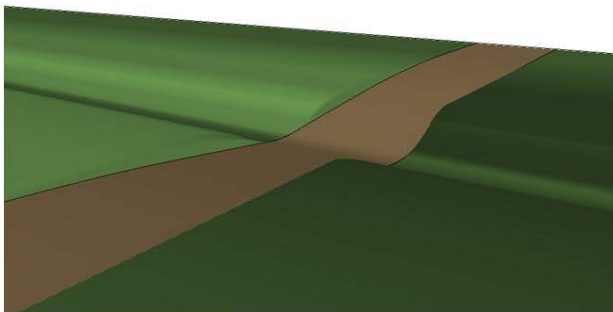
3.5.2 Erosion

The Wash Plan Area is a floodplain with alluvial soils susceptible to erosion. Following major flood events, trails may wash out, creating unstable surface conditions. Refer to the graphic below. Areas susceptible to erosion will require regular observation and maintenance.

Eroded trail before leveling



Eroded trail after leveling

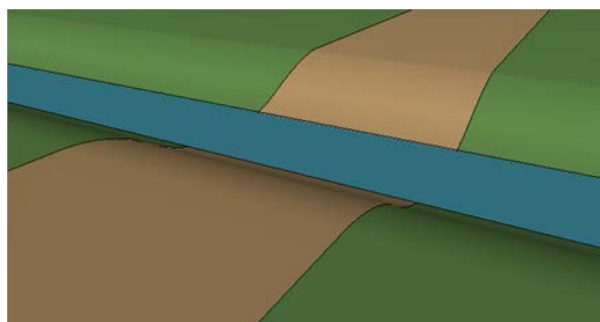
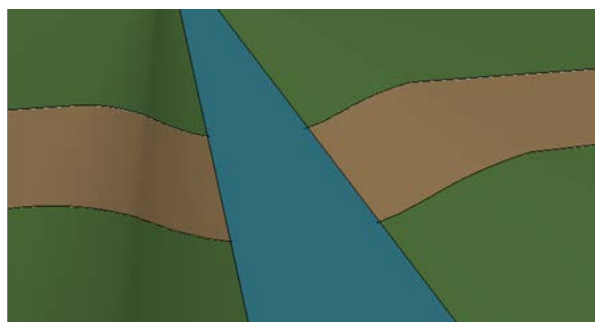


3.5.3 Flooding

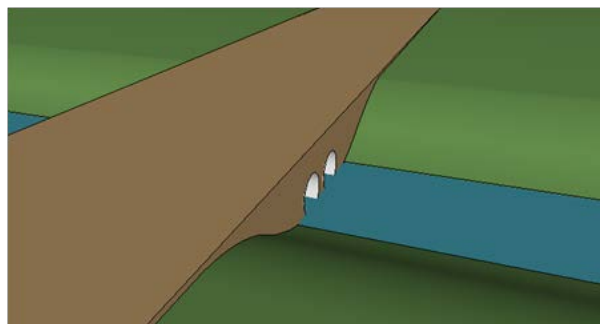
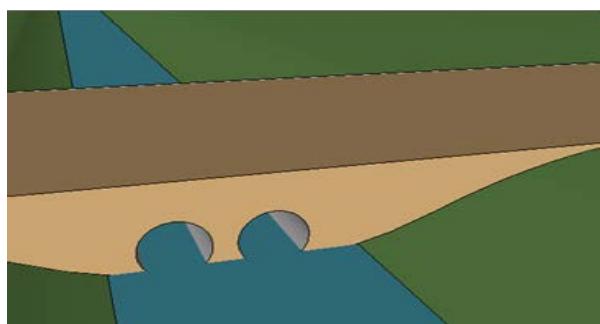
The trails system is susceptible to flooding impacts. Culverts may be sited to minimize flooded trails. See graphic below. Trails would be closed during and following storm events. Warning signage will be installed to advise trail users of areas subject to occasional flash flooding. For additional information related to flooding, refer to Appendix A, Flood Memorandum.



Trail before adding culvert passing



Trail after adding culvert passing



3.5.4 Growth of Vegetation on Trails

Removal of non-native or invasive vegetation in the trail path will be conducted on a periodic basis either by hand or mechanical means. If herbicides are required, appropriate handling and application procedures must be followed. If the vegetation is regularly and consistently removed, invasive species will have less opportunity to spread and out compete native plants. Unpaved trails within the Wash Plan area are maintained as part of the District's road maintenance program, a covered activity within the Wash Plan.

3.5.5 Infrastructure

In order to protect endangered species and habitat within the Preserve, parking areas, picnic areas, and restroom facilities are not currently planned within the Preserve. Signage, docents, and media (e.g., website, social media, and educational materials) will advise visitors how to prepare for visits to the Preserve.

3.5.6 Vandalism

Regular patrol and enforcement of the Preserve will be conducted and will require additional personnel. Prohibited actions such as graffiti painting, trash dumping, and property damage would be reported to the District, as well as, the party responsible for trail governance. In addition, maintenance workers periodically inspect the Preserve for vandalism, and report vandalism activities, and address repairs, as appropriate. Additional public use may increase the level of effort.

3.5.7 Flood Debris

The Preserve is susceptible to flood debris due to the flashy nature of the Upper Santa Ana River Wash. The Santa Ana River watershed drainage originates from snowmelt and precipitation in the San Bernardino Mountains flowing into Big Bear valley and accumulating behind Seven Oaks Dam. Controlled releases from Seven Oaks Dam are diverted to the District's infiltration facilities



within the Preserve. Non-diverted flow remains in the Santa Ana River channel and unites with Mill Creek creating potential flashy, debris flows downstream where Cone Camp trail crosses the Santa Ana River.

3.6 Description of Proposed Trail Locations

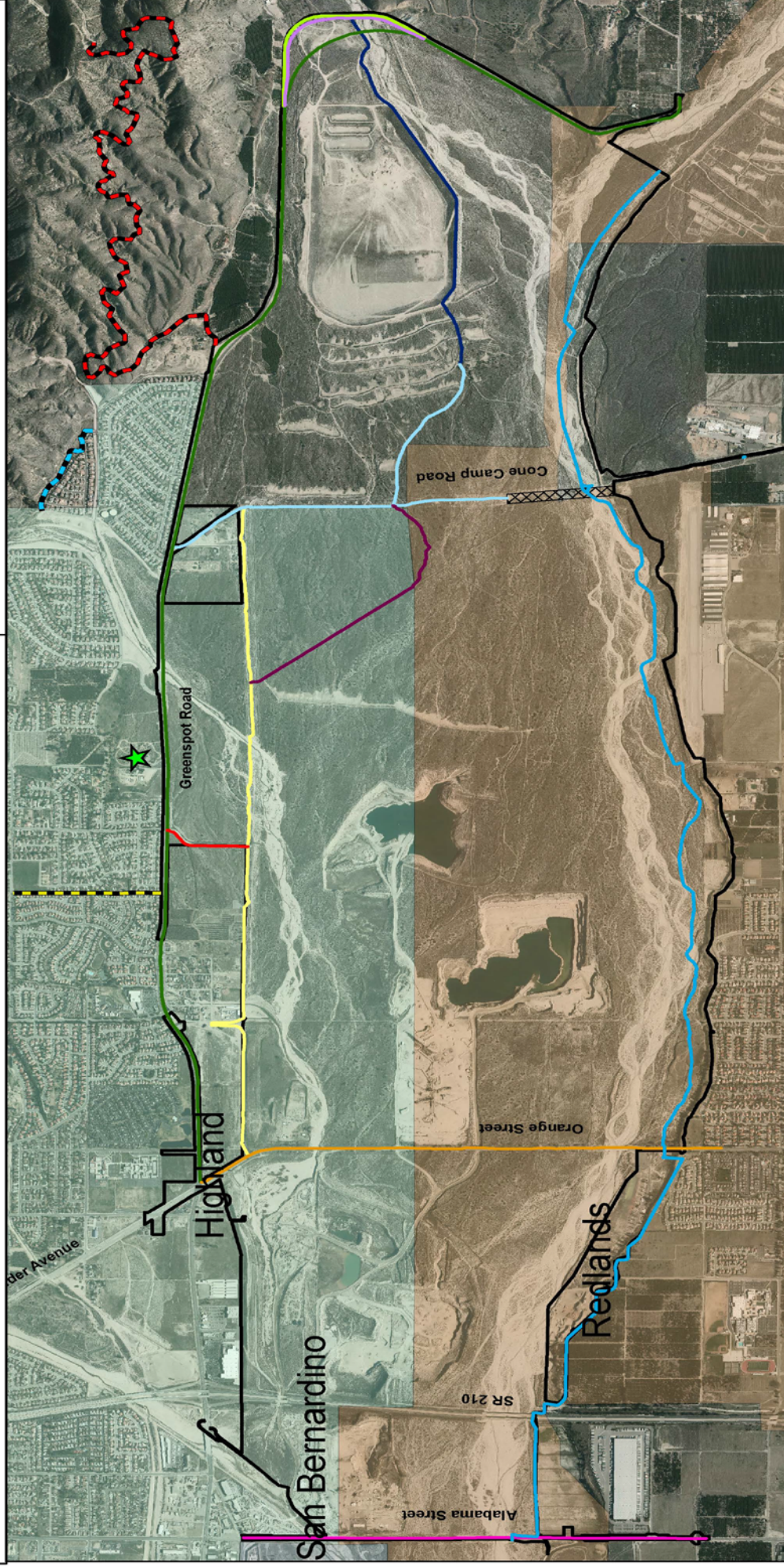
The proposed trails network, as shown in Figure 3-1, consists of ten trails. The following table provides general characteristics of each trail.

Number	Trail Name	Class Designation	Distance (mi)	User Types
1	Alabama Street	2	1.5	Bicyclist
2	Borrow Pit South Rim	1/1-B and 4	1.5	Pedestrians Mountain Bikers
3	Boulder Avenue / Orange Street	2	2	Bicyclist
4	Cone Camp Road	1/1-B	2	Pedestrian Mountain Bikers
5	Greenspot Road	2	4.5	Bicyclist
6 & 7	Old Greenspot Road (and Horse Trails)	1/1-B and 4	0.8	Equestrian Pedestrian Bicyclist
8	Old Rail Line	4	1	Pedestrian Mountain Biker
9	Pole Line	4	2.5	Pedestrian Mountain Biker
10	Santa Ana River	1	7	Pedestrian Bicyclists Inline Skaters
11	Weaver	4	0.3	Pedestrian Mountain Biker

Figure 3-1 PROPOSED TRAILS NETWORK

Coordinate System:
NAD 1983 StatePlane California V FIPS 0405 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Source: SBWMCO GIS
GIS Contact: Erin Berger

November, 14 2014



Trails

- Alabama Street Trail
- Borrow Pit South Rim Trail
- Boulder Avenue / Orange Street Trail
- Cone Camp Road Trail
- Greenspot Road Trail
- Old Greenspot Road Horse Trail
- Old Greenspot Road Trail
- Old Rail Line Trail
- Pole Line Trail
- Santa Ana River Trail
- Weaver Street Trail

Local Trails and Connections

- Alder Creek Road
- East Valley Corridor
- Northfork Trail
- Shelton Trail

- Aurantia Park
- WSPA Trail Connection
- Wash Plan Boundary

3.6.1 Alabama Street Trail

As a direct north-south connection between the Cities of Highland and Redlands, the Alabama Street Trail is proposed as a Class 2 bikeway on an existing paved roadway. Located along the westerly edge of the project boundary, it is anticipated that much of the access would be door to door (as opposed to those viewing the trail as a specific destination where they drive to an access point) with a formal access point for the intersection with the Santa Ana River Trail (SART). Signage would indicate the trail and connection points to other trails and/or activity centers within the area, including Citrus Plaza in the City of Redlands and City Creek Trail as shown in the City of Highland General Plan Update Multi-Use Trails Map. The City of Redlands General Plan would need to be amended to include the Alabama Street Trail.



Figure 3-2 Alabama Street Trail

3.6.2 Borrow Pit South Rim Trail

The Borrow Pit South Rim Trail would begin at the existing Greenspot Road on the easternmost point of the trail system, proceed westerly along the existing paved maintenance road, and connect to the Cone Camp Road Trail at the old Cone Camp labor camp. The western end of the Borrow Pit South Rim trail provides an internal link to the Old Rail Line Trail as well. Segments of this trail are both paved and unpaved; therefore, it is proposed under both Classes 1/1-B and Class 4 designations.



Signage would warn trail users about vehicles also using the trail to access the borrow pit and infiltration beds associated with water spreading activities. In addition, adequate safety measures would be implemented to prevent any potential interference with these

areas. Preferably, the Borrow Pit South Rim Trail should be physically segregated from the existing paved maintenance road to avoid mishaps. As the trail/road are separated by vegetated swales this could be done at minimal cost with signage/ bollards at intersections.

Access from Greenspot Road provides a trailhead location for numerous trail loops (i.e., Old Greenspot Road Trail and Old Rail Line Trail). The Borrow Pit South Rim Trail also provides access to the historic Santa Ana River Bridge.



Figure 3-3 Borrow Pit South Rim Trail

3.6.3 Boulder Avenue / Orange Street Trail

The Boulder Avenue/Orange Street Trail provides a direct north/south connection between residential areas of the Cities of Highland and Redlands. This trail is proposed as a Class 2 bikeway along both sides of the paved roadway section of Orange Street-Boulder Avenue right-of-way. Highland recently received a grant allowing an enhanced bikeway/trail to be constructed and is currently working with the City of Redlands to complete the planning for this linkage. The Wash Plan covers the impacts for the construction of either option. This roadway is served by the Omni Trans Route 15, which has two stops within the project site, providing convenient conveyance to this area for both bicyclists and pedestrians. To the south, this trail connects with the Santa Ana River Trail at Israel Beal Park near residential neighborhoods; to the north, it links with the (paved) Greenspot and (unpaved) Pole Line Trails near the Beattie Middle School and Highland Grove Elementary School. Street Parking near Israel Beal Park can provide vehicle access to the trail system. Direct access would be available in close proximity to these intersections; as a result, wayfinding signage would be critical. This trail would provide a convenient starting point for visitors wishing to make a full loop around the project site.



This trail is currently shown on the City of Highland General Plan Update Multi-Use Trails Map, whereas the City of Redlands General Plan (1995) currently shows a “north-south” trail along the unconstructed Church Street alignment located to the east of Orange Street. The Church Street trail would no longer be feasible with the implementation of the Wash Plan because any future construction of Church Street would be strictly limited for mining activities. The City of Redlands General Plan (1995) would need to be amended to replace the Church Street trail alignment with the Orange Street-Boulder Avenue Corridor. In addition, the Circulation Element of the City of Redlands General Plan currently identifies a Class 3 bikeway, a shared roadway, occurring along Orange Street within its city limits. Therefore, the City of Redlands General Plan would need to be amended to reclassify the Class 3 bikeway occurring along Orange Street to a Class 2 bikeway/trail to be consistent with the proposed trails plan.



**Figure 3-4
Boulder
Avenue /
Orange
Street Trail**

3.6.4 Cone Camp Road Trail

The (unpaved) Cone Camp Trail along Cone Camp Road would provide a direct north-south connection from the Highland residential neighborhoods along or north of Greenspot Road (Greenspot Road Trail) to the Santa Ana River Trail at Opal Avenue. A pedestrian-crossing bridge



would be the preferred option over the Santa Ana River. Without the pedestrian-crossing bridge to the Santa Ana River, the proposed Cone Camp Road Trail would terminate at an existing boulder and pylon barrier turn-around point. This trail also crosses with the (unpaved) Pole Line Trail and Old Rail Line Trail to the west and (unpaved) Borrow Pit South Rim Trail to the east. Although the southern limit of this trail

has no apparent on-street parking available, the intersection at Opal Avenue provides an access point. The closest public facility for available parking is at the Mentone Senior Center (approximately 1.25 miles south of the intersection of the Cone Camp Trail and Santa Ana River Trail). The senior center is served by OmniTrans. Compared to the northern limit of this trail, there is limited parking availability; however, there is a potential suitable area for parking roughly half-mile west along Greenspot Road. Thus, a trailhead could be built at the intersection of the Cone Camp and Greenspot Roads. This project would be located outside of the Wash Plan footprint and would require approval of the City of Highland.

The Cone Camp Trail is currently shown on the City of Highland General Plan Update Multi-Use Trails Map. The City of Redlands General Plan depicts a trail in the vicinity of the proposed Cone Camp Road Trail—the Santa Ana-Mentone Trail. The City of Redlands General Plan requires an amendment to remove the Santa Ana-Mentone Trail and amended to include the Cone Camp Road Trail.



Figure 3-5 Cone Camp Road Trail

3.6.5 Greenspot Road Trail

The (paved) Greenspot Trail provides a direct east-west connection for residential areas of the City of Highland to the north and Mill Creek to the south. Approximately 4.5 miles in length, the trail is proposed as a Class 2 bikeway along both sides of the paved roadway section of the Greenspot Road right-of-way. Portions of this trail are already marked with bicycle lanes.

From the northwest, this trail starts at Boulder Avenue (Boulder Avenue/Orange Street Trail) in close proximity to the Beattie Middle School and Highland Grove Elementary Street, just one block north of Greenspot Road. An access point at Orange Street and Greenspot Road may also provide a convenient starting point for visitors arriving by vehicle. Near the Plunge Creek overpass, this trail is accessible from Weaver Trail and Cone Camp Road Trail, approximately 1.4 and 2.5 miles, respectively, east of Boulder Street. Limited to no parking is available at this location, but an opportunity exists for the operator of the trail system to expand parking and access at the intersection of Alta Vista and Greenspot Road (approximately half-mile west of the Cone Camp Trail). Near the Santa Ana Canyon Road (that leads to Seven Oaks Dam), the Greenspot Road Trail and Old Greenspot Road Trail converge. This area may provide a trailhead opportunity with potential for vehicle parking, equestrian staging, and trail loops. At this location, the South Borrow Pit Rim Trail, historic Santa Ana River Bridge, and Greenspot Iron Trestle Bridge are accessed.



From the southeast, this trail is lined by orange groves and mostly accessed from Florida Avenue, which leads to the eastern limits of the Community of Mentone to the south. No on-street parking is available; however, potential parking may be available at the easternmost connection to the Santa Ana River at Garnet Street.



Figure 3-6 Greenspot Road Trail

3.6.6 Old Greenspot Road Trail

The Old Greenspot Road Trail follows the existing alignment of Greenspot Road, including across the Greenspot Iron Trestle Bridge, approximately one mile downstream from the Seven Oaks Dam. With the new Greenspot Road Bridge just westerly of the Iron Trestle Bridge, the existing roadway has been converted into a Class 1 Dedicated Bikeway with connection to the newly realigned Greenspot Road.



The Old Greenspot Road Horse Trail would be adjacent to the Old Greenspot Road Trail. This area, currently owned by SBFC, between the Old Greenspot Road and Greenspot Road Trails may provide a trailhead opportunity with potential for vehicle parking and equestrian staging. Additional, agreements between the trail operator and SBCF would be needed. In addition, the Old Greenspot Road Trail could

be used for occasional maintenance vehicles associated with the Seven Oaks Dam and the District.



Figure 3-7 Old Greenspot Road Trail

3.6.7 Old Rail Line Trail

The Old Rail Line Trail is an internal unpaved connection between the Pole Line Trail and Cone Camp Road Trail. Located along the abandoned railroad bed, this trail is an existing maintenance road primarily surfaced with crushed lava gravel (remnant of the old railway that served the local citrus industry). The alignment of this multi-use trail would continue to be slightly raised above the surrounding terrain (i.e., boulders and perennial shrubs), thereby preserving the adjacent natural habitat.

The crushed gravel surface of the Old Rail Line Trail would attract mountain bikers. Additionally, the numerous drainages and game paths that extend off of this trail would attract exploration and off-trail path finding. Consequently, off-road/off-trail use would be discouraged from entering the natural habitat/habitat conservation areas. Nonetheless, this trail and its connecting cross trails would fragment habitat and introduce human activity into areas that might not otherwise be disturbed into the future.



At the southern end of this trail, signage would be critical to direct trail users east to Cone Camp Road away from the more sensitive habitat areas with high quality habitat for federally-listed species. Similarly, at the north end, there is a well-defined turn-off to a maintenance road for the recharge areas that would be attractive to recreationists, taking them further into the center of the project site. Equestrian usage in this area would have the potential to introduce non-native weedy grasses and other plant species into the center of the project area and into areas currently supporting dense populations of Woolly Star.

The Old Rail Line Trail is currently shown on the City of Highland General Plan Update Multi-Use Trails Map. The City of Redlands General Plan does not depict a trail connecting the old rail line with Cone Camp Road; therefore, an updated General Plan would need to include the Old Rail Line Trail.



Figure 3-8 Old Rail Line Trail

3.6.8 Pole Line Road Trail

The Pole Line Road Trail is an unpaved west-east connection between Boulder Avenue/Orange Street Trail and Cone Camp Trail. Parallel to Greenspot Trail (one-quarter mile south), trail access is also available from the unpaved Weaver and Plunge Creek Trails. Unlike Greenspot Road, this trail is without vehicular traffic. East of Church Street, a portion of this trail would be located along the existing right-of-way of Abby Way, which currently terminates near an EVWD well site. Thus, occasional vehicular access may be encountered for regular maintenance of the utilities along this corridor.



The Pole Line Road Trail is located adjacent to areas of natural habitat; thus, it may be necessary to install physical barriers to prevent trail user incursions into these sensitive areas. The barrier types include large boulders or vegetation from the surrounding area. Where more prohibitive barriers would be required, step-through facilities and fencing may be used.

This trail is currently shown on the City of Highland General Plan Update Multi-Use Trails Map as an unpaved maintenance road for electrical utility and water conservation use. Construction of the portion of this trail from Orange Street to Church Street in the City of Highland is anticipated to occur as part of residential development entitlements and could be built on or contiguous to the existing Metropolitan Easement. Additionally, extending the trail to the east could make use of maintenance roads around the new SBVMWD spreading basins, but would require HCP amendment.



Figure 3-9 Pole Line Road Trail

3.6.9 Santa Ana River Trail

The Santa Ana River Trail (SART) is a Class 1 Bicycle Path from the Pacific Ocean at Huntington Beach along the Santa Ana River to Alabama Street in Redlands. It is planned to pass along the southern side of the SAR through Redlands. In the Community of Mentone, the trail is currently formalized between Garnet Street and Opal Avenue. Trail access is provided on these major intersections: Orange Street (via Israel Beal Park), Opal Avenue, and Garnet Street. Access from paved Alabama Street does not exist to the east. Access from Opal Avenue would be greatly improved when a pedestrian-crossing bridge is established over the Santa Ana River. In addition, the existing Bluffs Trail adjacent to residential neighborhoods in Redlands is parallel to the Santa Ana River Trail, which allows direct access from Riverview Drive. This trail is a major trail connection for many cities that abut the Santa Ana River, including the Cities of Highland and Redlands and County of San Bernardino; thus, its completion is a joint effort by multiple counties and agencies.

In terms of parking, on-street parking may be available from Israel Beal Park. Limited to no parking opportunities is available from Florida Avenue, Garnet Street, and Alabama Street.

SART Connector Spur

This connection is currently an unpaved spur on existing dirt roads and a temporary construction road, connects the SART with the southern edge of the WSPA. Ultimately upon SART construction, this spur will provide access along the Cone Camp trail to both the Wash Plan trails and trails within the City of Highland. Permission for crossing of the WSPA for trail use is outside the scope of the Wash Plan and will require concurrence from FWS and SBFC. The trail also crosses the Santa Ana River channel. This spur will be maintained in a manner similar to access roads and motorized equipment will not be used for maintenance within the river channel. As part of the WSPA crossing permission, a means to keep those crossing the river on the trail and not impacting WSPA lands will be demonstrated. The river crossing could also be accomplished through the construction of a pedestrian/bicycle bridge. The bridge would be the likely preferred option for Wash Plan species management, as it limits impacts in the active river channel.



Figure 3-10 Santa Ana River Trail

3.6.10 Weaver Trail

The Weaver Trail extends south from Weaver Street and Greenspot Road traffic intersection (Greenspot Road Trail) to Pole Line Trail. Due to its location, Aurantia Park provides an ideal entry point to the trails system with a traffic signal at Weaver Street to facilitate safe crossing of Greenspot Road. This unpaved trail is adjacent to an engineered drainage channel, which could



have originally been part of construction and/or maintenance access. It is also located along the edge of undeveloped areas identified as critical habitat. The northern portion of the alignment bisects a large block of undeveloped habitat and bends through an area identified as a mitigation area.



Figure 3-11 Weaver Trail

3.6.11 Plunge Creek Trail

The Plunge Creek Trail follows a short reach of the Plunge Creek channel from Greenspot Road, a short distance east of Alta Vista, to the Pole Line Trail. This unpaved connector trail provides access to the interior of the project site along the Pole Line Trail and would become more important as a connector route if access and parking were to be developed at Greenspot Road and Alta Vista. The trail ends where it intersects the Pole Line Trail where Plunge Creek has a series of braided channels that extend across the Pole Line Trail for at least a quarter mile. This trail is about a half mile east of the Weaver Street Trail and both trails serve a similar function. Probably only one of the two trails should be utilized to eliminate the duplication, depending on the location of access and parking on the Greenspot Road Trail.



To implement this trail path, large machinery would be required for significant earthwork. Thus, it would have an impact on the surrounding delicate environment, such as the Woolly Star Protection Area (WSPA) adjacent to each side of Plunge Creek. Also, Plunge Creek floods with frequency, and washes out the surrounding area; therefore, this trail would be washed out at every large rain event.



Figure 3-12 Plunge Creek Trail

3.7 Proposed Rules for Public Use of Trails in the Plan Area

It is essential that there are rules for use of the trails. These rules will provide the guidelines that allow users to make decisions for the benefit of the local environment and the sustainability of the trails systems. We also need these rules to keep the trails safe for everyone.

- All Class 4 multi-use unpaved trails would be for passive recreational uses, limited to:
 - Bird watching;
 - Hiking and mountain bike use on designated trails;
 - Photography; and
 - Scientific Research (observational, no collection of samples considered).
- Equestrian and off-highway (inclusive of motorized bikes) use is prohibited within the interior of the Planning Area (excluding normal maintenance vehicle). Equestrian uses frequently bring non-native seeds and other plant materials into sensitive habitat areas, compromising the non-native vegetation control plan. Consultations with representatives of the United States Fish and Wildlife Service (USFWS) indicate that the acreage compromises reached in the Task Force deliberations on mining and habitat balances would be threatened if regular equestrian uses were permitted on such interior trails and habitat preservation areas. Consequently, in working with development of a trails plan, the Cities of Redlands and Highland agreed that equestrian uses would be prohibited.
- Trail Markings, maintenance, directional signage, and barriers shall be designed and implemented such that adverse effects of passive recreation, such as trampling vegetation and erosion would be minimized.
- Motorized vehicular access by the public would be prohibited. Vehicular use shall be restricted to that necessary by public safety or emergency personnel, or for repair and maintenance activities.
- As appropriate, daily and seasonal limits on trails use would be established. When necessary, trails would be closed on a temporary basis to minimize disruption of nesting and other wildlife functions for species that would be covered by the subsequent Wash Plan, WSPA as modified by the proposed project, or ACEC and RNA as modified by the subsequent BLM land exchange, or if public access has resulted in, or is expected to result in, significant negative impacts to sensitive species. Passive recreational uses would be limited or restricted in critical wildlife areas during breeding season, as determined appropriate.
- The trails system would be closed from sunset to sunrise.
- Education and outreach would be used to increase public awareness and appreciation for habitat and wildlife values. Informational signage would be placed at strategic locations throughout the trails of the Planning Area to explain the nature and sensitivity of the protected habitat. Public access information packets and guides would be developed for

users of trails in the Planning Area. These packets would be made available on all participating agency websites




- Feeding of all wildlife would be prohibited.
- The following litter control measures would be implemented along the trails:
 - Closed garbage cans and recycling bins would be provided at trailheads and access points.
 - Litter and trash would be collected and removed on a regular basis, either as a matter of funding for the administration of the trails or through implementation of an “adopt a trail” program. Garbage cans and recycling bins would be maintained appropriately
 - Penalties would be imposed for littering and dumping on Planning Area Trails
- Pets are required to be leashed at all times.

Section 4

Design Guidelines

4.1 Ancillary Trail Facilities and Amenities

The following facilities and amenities are included in the Trails Master Plan for consideration as trail implementation progresses. Informational signage, waste receptacles, and pet waste bags will be required. Other amenities such as benches, restrooms, and drinking fountains are provided at nearby Aurantia Park in the City of Highland.

Description		Recommendations
 <p>7</p>	<p>Wide varieties of benches exist for use along trails and can serve as rest areas. Style and material selection should be based on desired design and cost, or standard set by the city.</p>	<p>In general, benches should have back rests and arm rests on both sides (with optional arm rests in the middle). Benches should generally be 16" to 20" above the ground, 18" to 20" in depth, and 60" to 90" in width. Benches should be placed along trail routes and near trail entrances.</p>
 <p>8</p>	<p>Waste receptacles for trash and recyclables help reduce litter.</p>	<p>In general, trail entrances and activity areas should have waste receptacles. The location of receptacles should be easily accessible by service vehicles.</p>
 <p>9</p>	<p>Pet waste bags to facilitate users in cleaning up after their pets.</p>	<p>In general, trail entrances and activity areas should have pet waste bag dispensers. The location of dispensers should be easily accessible by service vehicles.</p>

⁷ <http://images3.alphacoders.com/267/267159.jpg>

⁸ <http://pqliving.com/wp-content/uploads/2008/03/new-can.jpg>

⁹ http://4.bp.blogspot.com/-_OL4722CgKg/Tt1kWU0UkfI/AAAAAAAAA0s/UZ9gHv-zY2E/s1600/New+Dog+Bag+Dispenser+Ad+sign+2011.jpg


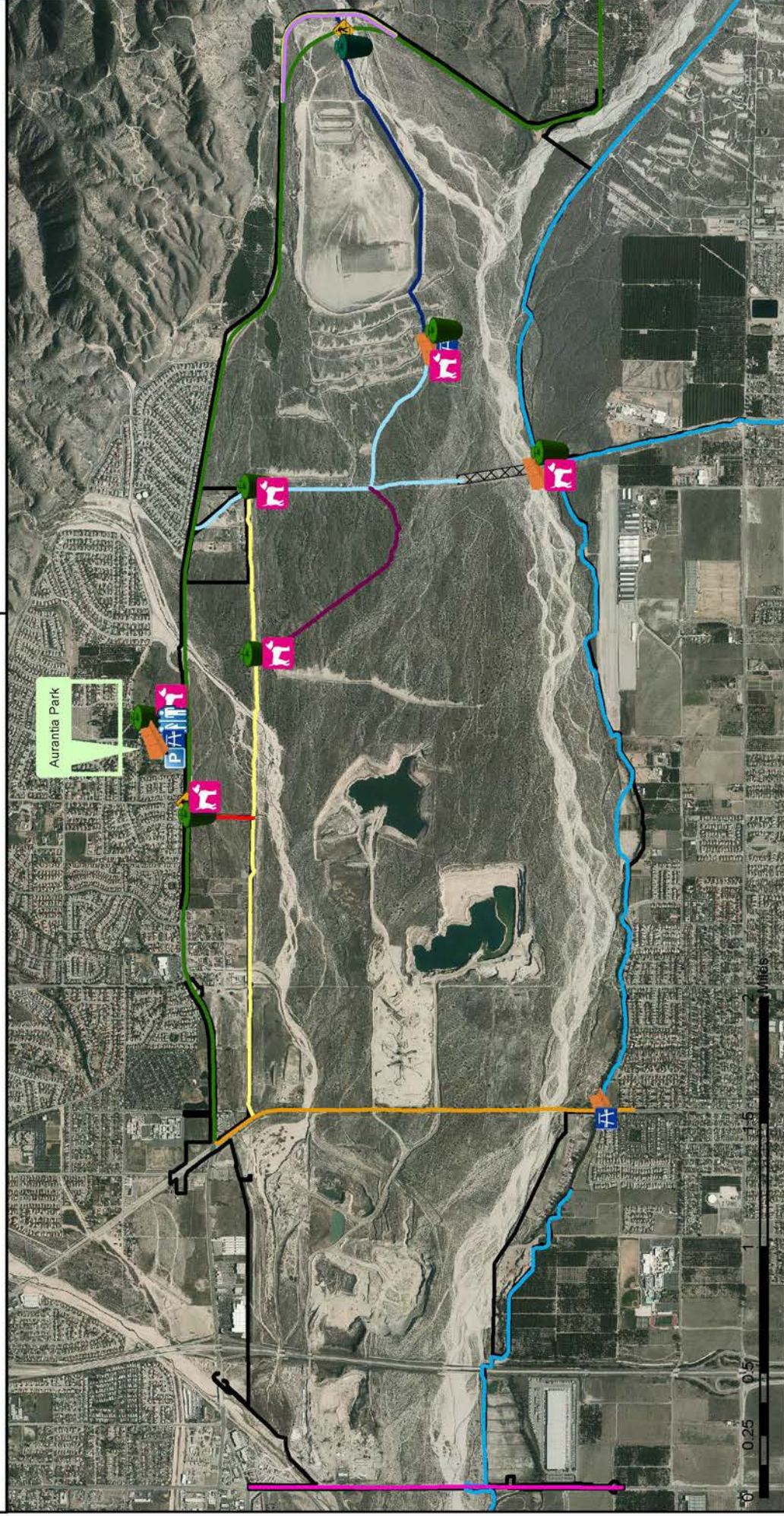
Description		Recommendations
 <p>14</p>	<p>Trail heads will help users understand the network of trails by displaying maps and other relevant information on an informational kiosk.</p>	<p>Trail heads should be located at major entry points in the trails system.</p>

Figure 4-1 Ancillary Trail Facilities and Amenities



Coordinate System:
NAD 1983 StatePlane California v FIPS 9405 Feet
Projection: Lambert Conformal Conic
Datum: NAD 1983
Source: SBWCD GIS
GIS Contact: E. Berger & J. Zhou

November 3, 2016



Ancillary Trail Facilities and Amenities

- Bench
- Crosswalk
- Parking
- Pet Waste Bags
- Rest Area
- Restroom
- Waste Receptacle

Trails

- Alabama Street Trail
- Borrow Pit South Rim Trail
- Boulder Avenue / Orange Street Trail
- Cone Camp Road Trail
- Greenspot Road Trail

- Old Greenspot Road Horse Trail
- Old Greenspot Road Trail
- Old Rail Line Trail
- Pole Line Trail
- Santa Ana River Trail
- Weaver Street Trail

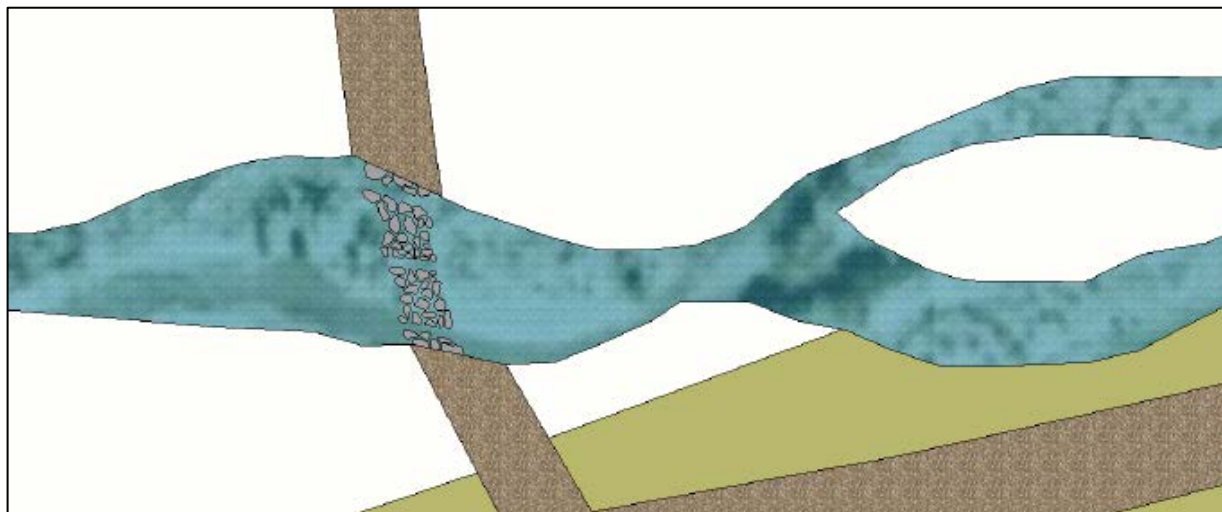
- Wash Plan Boundary
- WSPA Trail Connection

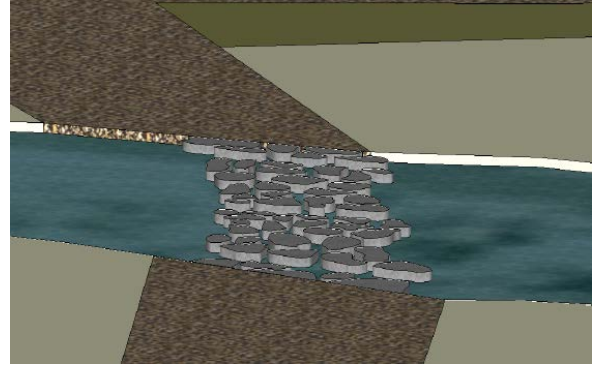
4.2 WSPA Crossing

The Cone Camp Trail has a small section that crosses the WSPA Area on the southern end of the trail. South of the WSPA Area, the trail crosses the Santa Ana River. Although the Santa Ana River

is dry during most of the year, there is seasonal flow in this section of the river. During high flow events, gates on either side of the river will be required to limit access. Ideally, a bridge would allow users to safely cross the river without getting wet or swept away and limit damage to habitat resources.

A trail crossing in the WSPA area would require additional environmental review and permitting to avoid impacts to species listed in the Wash Plan. The Cone Camp road across the WSPA is currently blocked with boulder barriers.











4.3 Hazards

Visitors to the Preserve must be aware of, and prepared to avoid, potential hazards to wildlife and natural terrain. Informational signage, docents, rangers, and media will be used to educate visitors of these potential hazards. The list below and the hazards matrix that follows describes potential hazards within the Preserve.

- Fire
- Hazardous or Uneven Terrain
- Inclement Weather
- Rattlesnakes
- Mountain Lions
- Coyotes
- Bees (from bee keeping activities)
- Stinging or rash-inducing vegetation






Hazard Type	Description	Recommendations
<p>Fire¹⁰</p>  <p>11</p>	<p>Wildfires can create widespread threats to public health and the environment.</p> <p>It is critical that response and recovery efforts quickly address any potential hazards. This will reduce impacts to surrounding communities.</p>	<p>The following recommendations can be made to the public with appropriate signage:</p> <ul style="list-style-type: none"> •No smoking. •Leave the area. Don't wait around to see how things develop. •Maintain situational awareness. Be aware of what's going on around you at all times. •Plan ahead. Identify escape routes/safe zones where you could take shelter if a fire came through the area. • Breathe inside your clothing next to your body to protect your respiratory tract so you don't inhale smoke or hot gasses.
<p>Hazardous Terrain</p> 	<p>Some trails have rock piles adjacent to trail alignments. Hikers may try to climb or walk on the rocks. Similar hazards exist with District diversion structures. Also, shared roads used for mining activities within the borrow pit can be hazardous.</p>	<p>Warning signage will be posted to keep visitors off hazardous terrain.¹²</p> 
<p>Inclement Weather</p> 	<p>Storms, fog, flash floods, strong winds, poor visibility, and other related conditions create hazards for visitors.</p>	<p>Warning signage will be posted (e.g., flash floods):</p> <ul style="list-style-type: none"> • Intersection of Pole Line Trail and Plunge Creek • Intersection of Pole Line Trail and Weaver Trail 
<p>Pre-existing Medical Conditions^{13, 14}</p> 	<p>Some medical pre-existing conditions may be triggered or worsened by outdoor activity, particularly when it is sudden or strenuous. Examples include heart disease, asthma, diabetes, anemia, and allergies. Vertigo and neurological illnesses may have serious consequences on dangerous terrain.</p>	<ul style="list-style-type: none"> •Orientation signs and maps to help first responders locate hikers in need of medical assistance. •Informational signage, docents, rangers, and media will be used to educate visitors of these potential hazards.

¹⁰ Fire Response and Recovery (CalEPA Information) <http://www.calepa.ca.gov/disaster/fire>

¹¹ <http://www.quoteaustininsurance.com/images/Grass%20Fire.jpg>

¹² <http://www.perfectduluthday.com/wp-content/uploads/2010/05/Handicapped-Stay-off-the-Rocks-350x262.jpg>

¹³ Camping and Outdoor Equipment (Hazards of outdoor activities) <http://campingandoutdoorequipments.blogspot.com/2011/03/hazards-of-outdoor-activities.html>

Hazard Type	Description	Recommendations
<p>Heat Stroke¹⁵</p>  <p>16</p>	<p>Dehydration can rapidly incapacitate an adventurer, especially in warm weather. In conditions of low humidity, sweat evaporates so quickly that a person may not notice the water loss.</p> <p>Heat exhaustion, possibly developing into heatstroke, can occur in hot weather, particularly if one is dehydrated or dressed too warmly.</p>	<ul style="list-style-type: none"> • Carrying and drinking an adequate amount of water helps avoid dehydration. Infiltration basin water is unfit to drink. • Eating salty snacks together with drinking water helps to avoid sodium deficiency. • The risk of heatstroke can be minimized by avoiding direct sun if the temperature is too high, and staying wet when possible. This is a life-threatening condition: a victim must be cooled off and transported to a hospital immediately. • Use sunscreen. • Wear protective wear (i.e. hats)
<p>Rattlesnakes</p> 	<p>Rattlesnakes are native to this area and are more active in warm weather. Visitors must be careful when stepping over logs and avoid putting hands or feet under logs or rocks. Trail users should stay on marked trails and look carefully before approaching brushy/rocky areas.</p>	<ul style="list-style-type: none"> • Hikers need to be warned about the presence of rattlesnakes in the trail areas with signs.¹⁷ 
<p>Mountain Lions¹⁸</p>  <p>19</p>	<p>About half of California is prime mountain lion country. This fact is a surprise to many residents and visitors. These large, powerful predators have always lived here, preying on deer and other wildlife, and playing an important role in the ecosystem.</p> <p>Like any wildlife, mountain lions can be dangerous. With a better understanding of mountain lions and their habitat, we can coexist with these magnificent animals.</p>	<ul style="list-style-type: none"> • A public warning sign with basic instructions on what to do when encountering a mountain lion.²⁰ 

¹⁴ <http://www.z-id.com/wp-content/uploads/2013/11/inhaler-2-1024x862.png>

¹⁵ Hazards of outdoor activities (Wikipedia) http://en.wikipedia.org/wiki/Hazards_of_outdoor_activities





¹⁶ <http://www.ironsimba.co.uk/wp-content/uploads/2012/12/drink-water.jpg>

¹⁷ [http://upload.wikimedia.org/wikipedia/commons/b/be/Caution_rattlesnakes_\(sign\).jpg](http://upload.wikimedia.org/wikipedia/commons/b/be/Caution_rattlesnakes_(sign).jpg)

¹⁸ Nature & Science (Mendocino National Forest) http://www.fs.usda.gov/detailfull/mendocino/learning/nature-science/?cid=FSBDEV3_004447&width=full

¹⁹ <http://imgs.sfgate.com/blogs/images/sfgate/inmarin/2010/09/20/MountainLion3480x360.jpg>

²⁰ <http://hilobrow.com/wp-content/uploads/2010/12/Mountain-Lion-Warning-Sign.jpeg>

Hazard Type	Description	Recommendations
<p>Coyotes²¹</p>  <p>22</p>	<p>Coyotes are found in nearly every type of habitat in California from deserts to mountains, and from wild lands to urban areas. While they typically forage for birds, mice, insects, fruits, and rabbits, they have been known to pick through garbage cans and attack pets. They are found commonly on the Wash.</p>	<p>Provide the following recommendations to the public:</p> <ul style="list-style-type: none"> •Do not feed. •Keep your distance and do not approach the animal. •Keep your pets on leash. •If a coyote approaches you or your pet, throw rocks or sticks to frighten it. •Use a loud authoritative voice to frighten the animal.
<p>Bees</p>  <p>23</p>	<p>Bee keeping is an active use within the Preserve. Bee stings are painful and can be deadly if the victim is allergic to the bee venom.</p>	<ul style="list-style-type: none"> •Warning Signs about beehives.  <p>24</p>
<p>Mosquitoes</p>  <p>25</p>	<p>District infiltration basins can attract mosquitoes and can be breeding grounds for mosquitoes.</p>	<ul style="list-style-type: none"> •Warning signs about mosquitoes near infiltration basins. Visitors should be warned about hazards due to mosquito bites.

²¹ Coyotes (Openspace.org) http://www.openspace.org/preserves/highlight_coyotes.asp

²² http://activerain.trulia.com/image_store/uploads/agents/beaniehunter/files/IMG_7967.JPG

²³ <http://newandroidwallpapers.blogspot.com/2013/05/best-collection-of-honey-bees.html>

²⁴ http://channel.nationalgeographic.com/exposure/content/photo/photo/2076633_photo-162_7hqdmj4am3d2cszxsyeykq4xpncurxbvj6lwuht2ya6mzmafma_990x742.jpg

²⁵ <http://www.mosquitotrap.com/wp-content/uploads/2010/01/disease-warning1.jpg>

4.4 Way finding and Signage

The challenge of a comprehensive trails signage system is to represent a wide variety of information clearly and attractively. Further, it is important to respect the natural environment by avoiding sign clutter and unnecessary messages. A wayfinding system should be apparent when you need it and transparent when you don't. The system must be designed to work year-round to support all year public access. Signage elements must be designed to remain effective through winter conditions and significant rain.

4.4.1 Information Brackets

The wayfinding system needs to convey eight brackets of information. Each wayfinding element will serve a specific function, but they should all be visually integrated to present a seamless system to users.

- Bracket 1: Identification
- Bracket 2: Orientation
- Bracket 3: Regulations
- Bracket 4: Safety
- Bracket 5: Trail Branding
- Bracket 6: Interpretive
- Bracket 7: Water Recharge/Conservation
- Bracket 8: Habitat Conservation

4.4.1.1 Bracket 1: Identification

- Portal and trailhead entrances
- Parks that include trail access
- Neighborhood exits/entrances
- Underpasses and cross streets
- Seasonal trail types, including river crossing notices
- Landmarks, historical sites or other points of interest along the trail
- Indication of transitions between town and/or private, state or federal land ownership



4.4.1.2 Bracket 2: Orientation

- Signs pointing to major destinations
- “Distance to...” and length of trail information
- Mile and/or Kilometer markers
- Cardinal directions and GPS coordinates
- “You are Here” maps placed at trailheads
- Maps placed along the path to help users gauge their progress along the trails



4.4.1.3 Bracket 3: Regulations

- Stated rules and regulations
- Trail Access Information label
- Signage on trails warning users of upcoming trail crossings
- Vehicular guides on surrounding roadways directing to parking areas (handled through the Cities and Caltrans)
- All regulatory signs shall conform to the Manual on Uniform Traffic Control Devices (MUTCD) as published by the Federal Highway Administration



4.4.1.4 Bracket 4: Safety

- Roadway signage to inform drivers of an upcoming trail crossing (handled through the Cities and Caltrans)
- Signage to inform users when the trail ends, possibly also indicating distance
- Signs to identify hazards such as flooding, wildlife warnings, etc.



4.4.1.5 Bracket 5: Trail Branding

- Unifying identity element or elements serve as the “brand” for the preserve
- Consistent aesthetic standard communicates brand
- Private or organizational sponsorship information where needed
- Identify regional established trails such as the SART



4.4.1.6 Bracket 6: Interpretive

- Provide visitors with historic, scenic, environmental, or interesting information along the trail
- Design should coordinate visually with the wayfinding signage
- Provide visitors with information about other activities on the Wash (e.g. mining)



4.4.1.7 Bracket 7: Water Recharge and Conservation

- Inform visitors about the importance of maintaining clean water
- Explain the local water conservation process
- Establish the connection between pond water and the water they use



4.4.1.8 Bracket 8: Habitat Conservation

- Explain the importance of habitat conservation
- Describe the local endangered species and their habitat
- Denote the location of WSPA
- Identify protected areas within Wash Plan

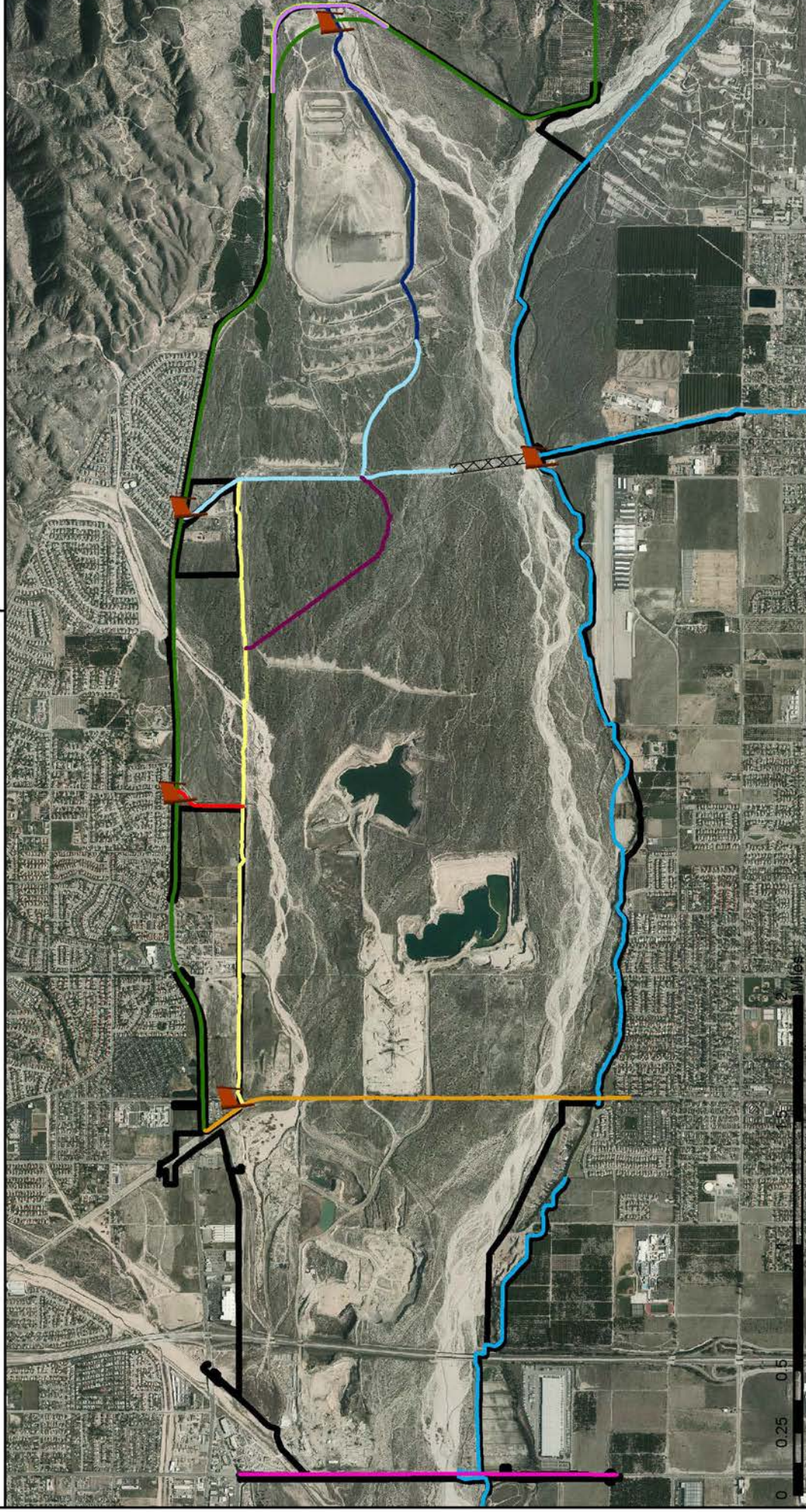


Figure 4-2 Bracket 1 Signs: Identification



Coordinate System:
NAD 1983 StatePlane California V FIPS 5405 Feet
Projection: Lambert Conformal Conic
Datum: NAD 1983
Source: SBWCD GIS
GIS Contact: E. Beniger & J. Zhou

November 3, 2016



Bracket 1 Signs: Identification

-  Identification Signs
-  WSPA Trail Connection
-  Wash Plan Boundary

Trails












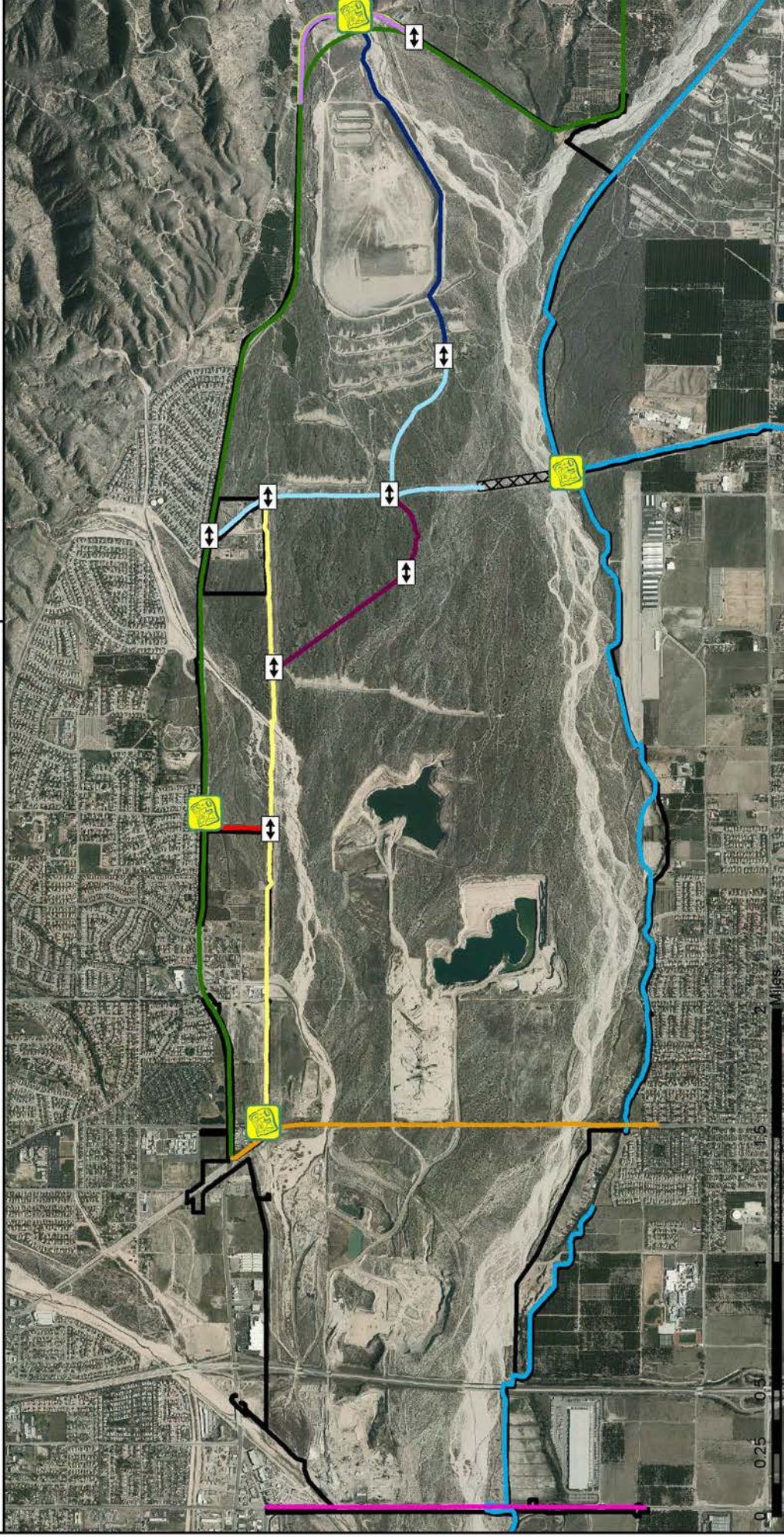
-  Alabama Street Trail
-  Borrow Pit South Rim Trail
-  Boulder Avenue / Orange Street Trail
-  Cone Camp Road Trail
-  Greenspot Road Trail
-  Old Greenspot Road Trail
-  Old Greenspot Road Horse Trail
-  Old Rail Line Trail
-  Pole Line Trail
-  Santa Ana River Trail
-  Weaver Street Trail

Figure 4-3 Bracket 2 Signs: Orientation



Coordinate System:
 NAD 1983 StatePlane California v FIPS 4005 Feet
 Projection: Lambert Conformal Conic
 Datum: North American 1983
 Source: SBVWCD GIS
 GIS Contact: Erin Berger

November 3, 2016



Bracket 2 Signs: Orientation

- Directional Sign
- Map
- WSPA Trail Connection
- Wash Plan Boundary

Trails

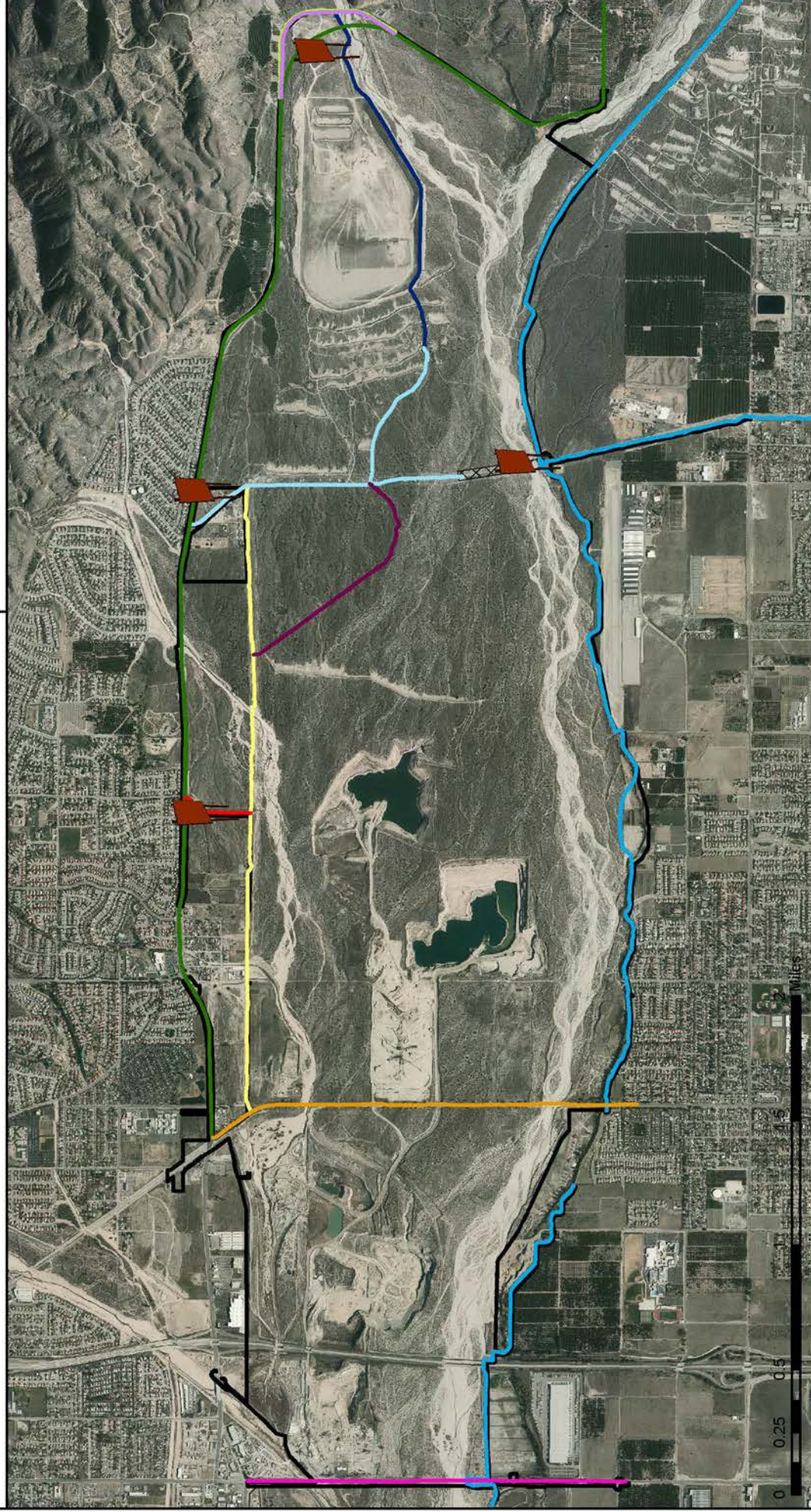
- Alabama Street Trail
- Borrow Pit South Rim Trail
- Boulder Avenue / Orange Street Trail
- Cone Camp Road Trail
- Greenspot Road Trail
- Old Greenspot Road Horse Trail
- Old Greenspot Road Trail
- Old Rail Line Trail
- Pole Line Trail
- Santa Ana River Trail
- Weaver Street Trail

Figure 4-4 Bracket 3 Signs: Regulations



Coordinate System
 NAD 1983 StatePlane California V FIPS 4005 Feet
 Projection: Lambert Conformal Conic
 Datum: North American 1983
 Source: SBWCD GIS
 GIS Contact: E. Berger & J. Zhou

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Trails

- Alabama Street Trail
- Borrow Pit South Rim Trail
- Boulder Avenue / Orange Street Trail
- Cone Camp Road Trail
- Greenspot Road Trail
- Old Greenspot Road Horse Trail
- Old Greenspot Road Trail
- Old Rail Line Trail
- Pole Line Trail
- Santa Ana River Trail
- Weaver Street Trail

Bracket 3 Signs: Regulations

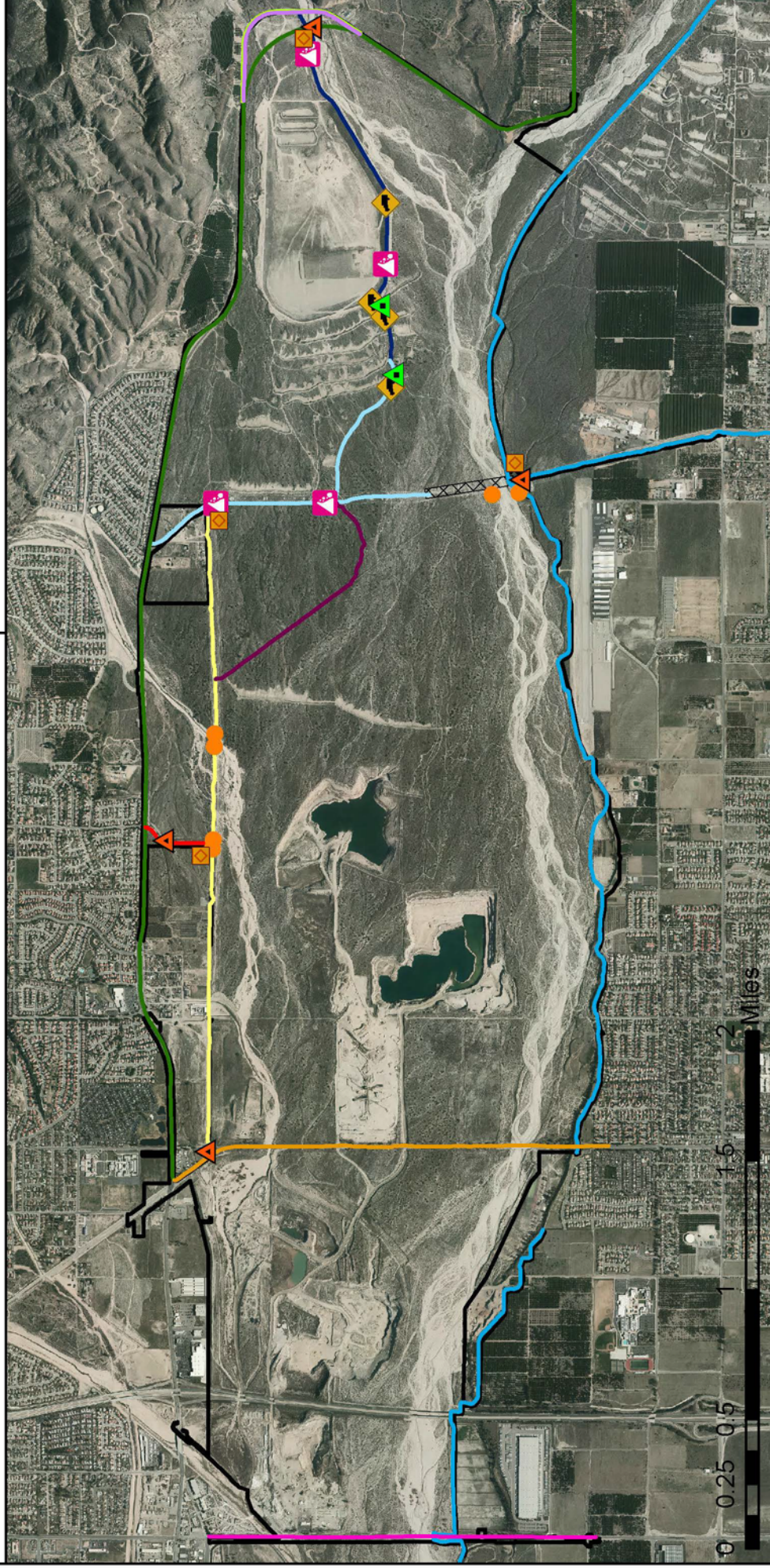
- Regulation Sign
- WSPA Trail Connection
- Wash Plan Boundary

Figure 4-5 Bracket 4 Signs: Safety & Hazards



November 3, 2016

Coordinate System:
NAD 1983 StatePlane California V FIPS 0405 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Source: SBVWCD GIS
GIS Contact: E. Berger & J. Zhou



Bracket 4 Signs: Safety Hazards

- Road Hazard
- Basin Structure
- Flash Flood
- General Advisories
- Rock Climbing Hazard
- Rattlesnake

Trails

- Alabama Street Trail
- Borrow Pit South Rim Trail
- Boulder Avenue / Orange Street Trail
- Cone Camp Road Trail
- Greenspot Road Trail
- Old Greenspot Road Trail

- Old Greenspot Road Trail
- Old Rail Line Trail
- Pole Line Trail
- Santa Ana River Trail
- Weaver Street Trail
- Wash Plan Boundary
- WSPA Trail Connection

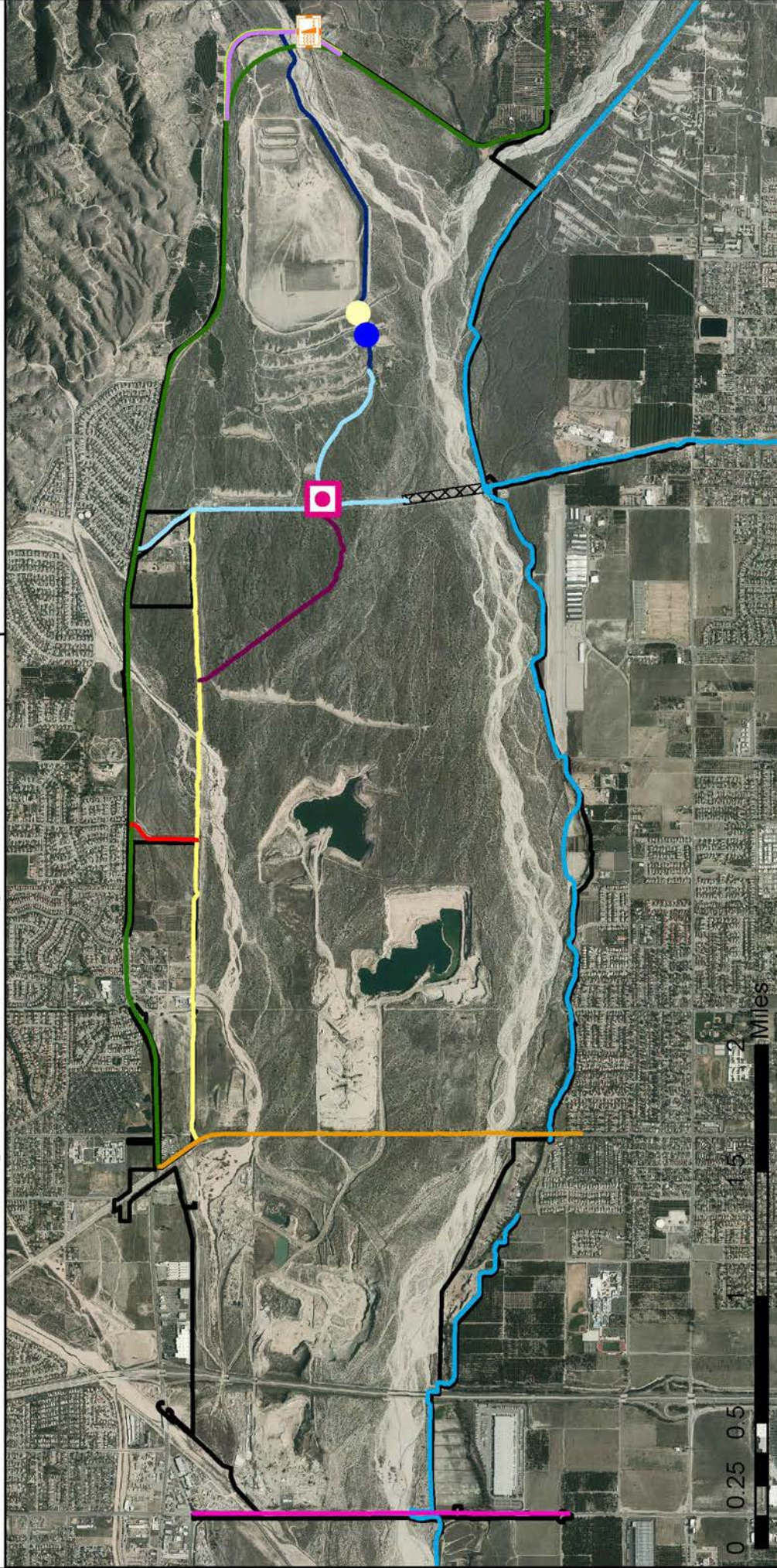
Figure 4-6

Bracket 6 Signs: Interpretive

Bracket 7 Signs: Water Recharge & Conservation

Coordinate System:
NAD 1983 StatePlane California V FIPS 8406 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Source: SDWCD GIS
GIS Contact: E. Berger & J. Zhou

November 3, 2016



Bracket 6 Signs: Interpretive

- Borrow Pit Info
- Cone Camp History
- Seven Oaks Dam Info

Bracket 7 Signs: Water Recharge & Conservation

- Spreading Basin Info

Trails

- Alabama Street Trail
- Borrow Pit South Rim Trail
- Boulder Avenue / Orange Street Trail
- Cone Camp Road Trail
- Greenspot Road Trail

- Old Greenspot Road Horse Trail
- Old Greenspot Road Trail
- Old Rail Line Trail
- Pole Line Trail
- Santa Ana River Trail
- Weaver Street Trail

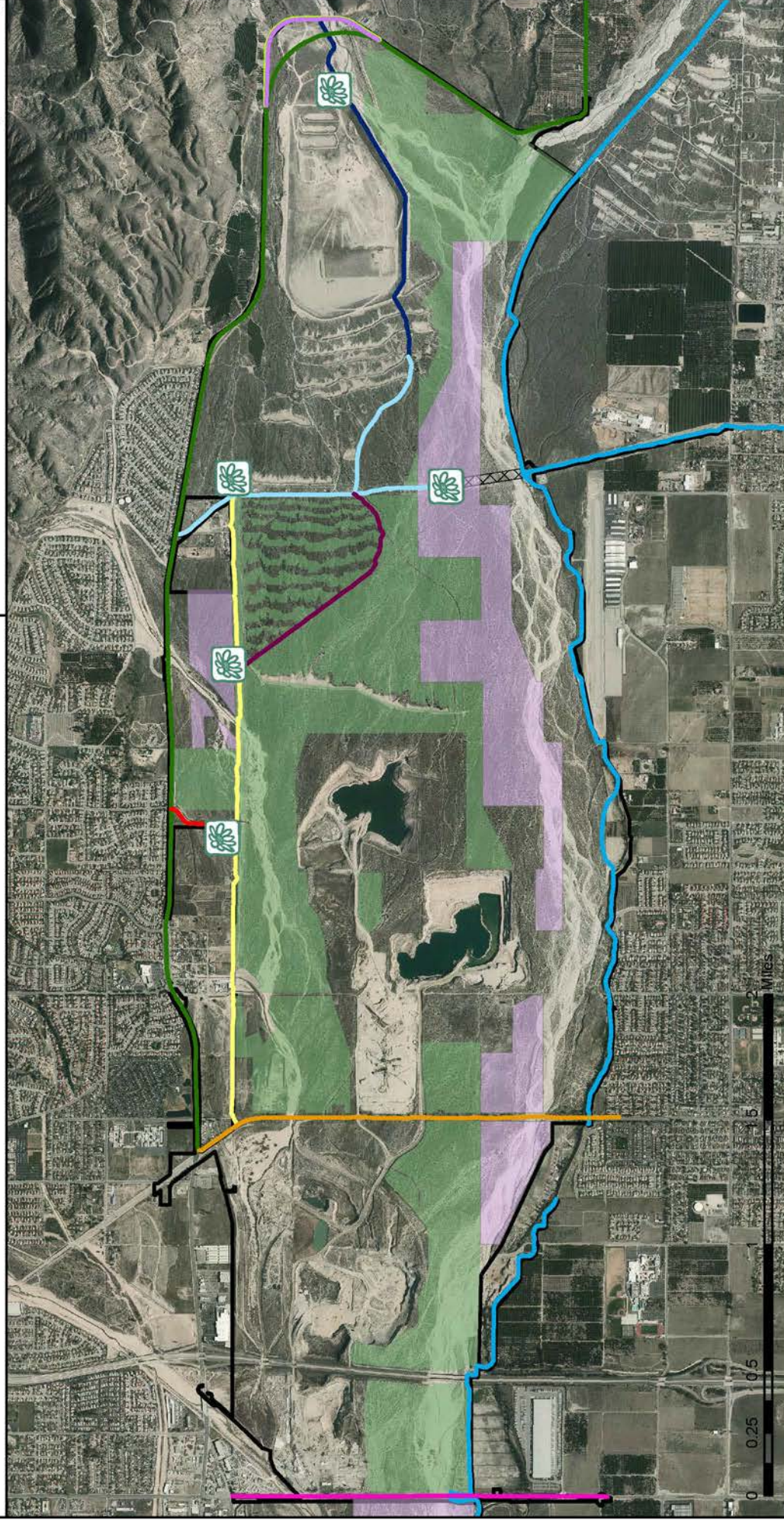
- WSPA Trail Connection
- Wash Plan Boundary

Figure 4-7 Bracket 8 Signs: Habitat Conservation








November 3, 2016











Coordinate System:
NAD 1983 StatePlane California V FIPS 0405 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Source: SERVCD GIS
GIS Contact: E. Berger & J. Zhou



Bracket 8 Signs: Habitat Conservation

-  Bracket 8 Signs: Habitat Conservation
-  Preserved Lands
-  WSPA
-  WSPA Trail Connection
-  Wash Plan Boundary


Trails

-  Alabama Street Trail
-  Borrow Pit South Rim Trail
-  Boulder Avenue / Orange Street Trail
-  Cone Camp Road Trail
-  Greenspot Road Trail
-  Old Greenspot Road Horse Trail
-  Old Greenspot Road Trail
-  Old Rail Line Trail
-  Pole Line Trail
-  Santa Ana River Trail
-  Weaver Street Trail

4.5 Habitat Protection and Maintenance

Habitat within the Preserve will require regular maintenance activities including removal and cleanup of trash that is dropped on the trails. Periodic community cleanup days will be organized where teams of people work to pick up garbage found along the trails, road, or river. Boulders and vegetation will be maintained to prevent trail users from entering environmentally sensitive areas.

4.6 Other Safety and Regulation Measures

	Description	Recommendation
<p>Boulder Barriers</p>  <p>26</p>	<p>Boulder barriers may be used to keep users on trails away from sensitive habitat, District facilities, roadways, or safety hazards.</p>	<p>Barriers should be made of natural materials whenever possible to maintain a natural look. They should be durable and generally resistant to vandalism.</p>
<p>Gates</p>  <p>27</p>	<p>Swing gates may be used to restrict vehicle access and to keep users on trails away from sensitive habitat, roadways, District facilities, or safety hazards.</p>	<p>Gates should be durable and generally resistant to vandalism. Specialty gates may also be used to limit access to pedestrians only.</p>

²⁶ <http://www.gardeninggonewild.com/wp-content/uploads/2008/05/boulder-wall-on-canary-rd-march-08.jpg>

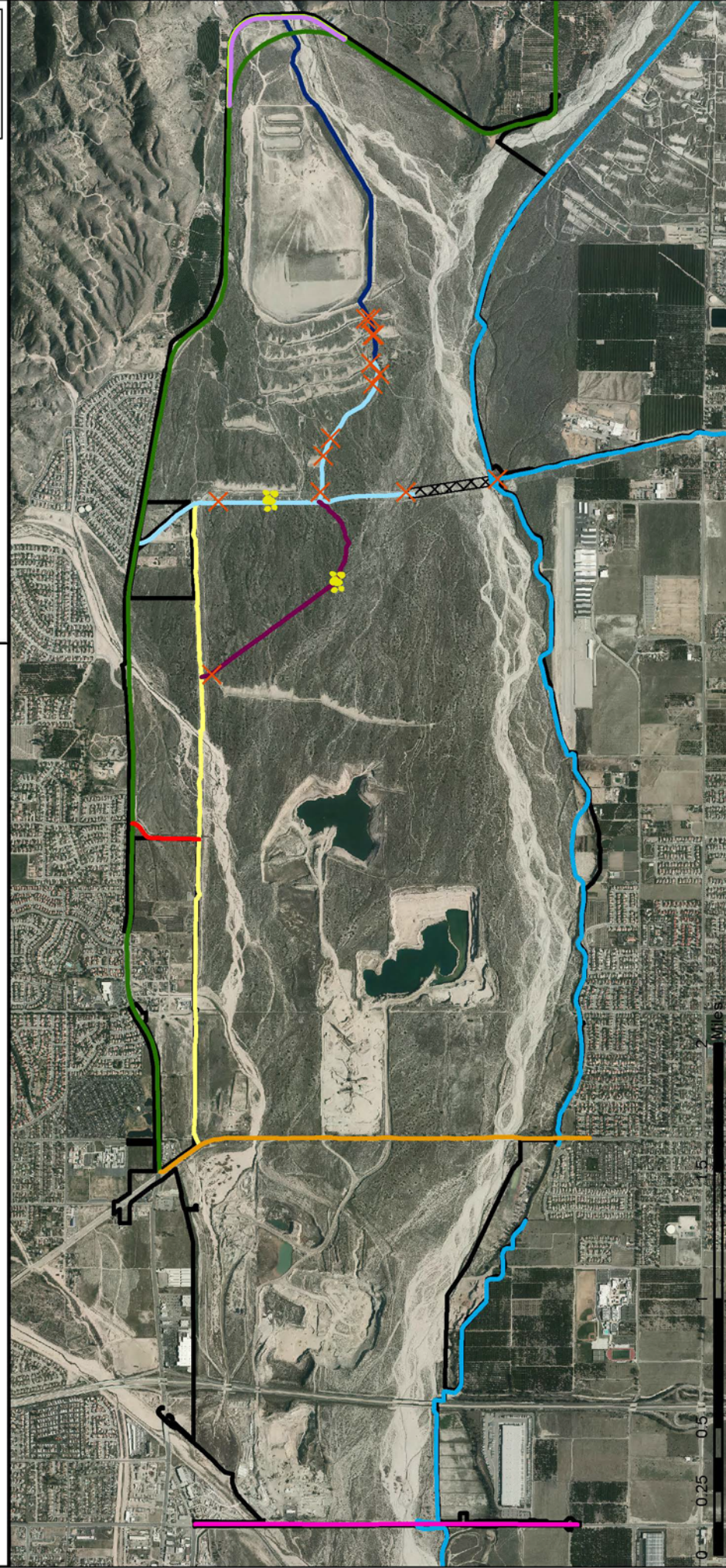
²⁷ <http://www.unisoncctv.co.uk/wp-content/uploads/2012/08/manual-swinging-access-gate.jpg>

Figure 4-8 Potential Gate Locations



Coordinate System:
 NAD 1983 StatePlane California V FIPS 9405 Feet
 Projection: Transverse Mercator
 Datum: North American 1983
 Source: SEVWCD GIS
 Scale: 1:24,000
 GIS Contact: E. Berger & J. Zhou

November 3, 2016



Proposed Structures

- Boulder Barrier
- Gate

Trails

- Alabama Street Trail
- Borrow Pit South Rim Trail
- Boulder Avenue / Orange Street Trail
- Cone Camp Road Trail
- Greenspot Road Trail
- Old Greenspot Road Horse Trail

- Old Greenspot Road Trail
- Old Rail Line Trail
- Pole Line Trail
- Santa Ana River Trail
- Weaver Street Trail

- Wash Plan Boundary
- WSPA Trail Connection

Section 5

Implementation

Prioritization and phasing of project implementation will be based on capital availability, anticipated operation and maintenance budget and other potential funding sources. Additionally, a governance body able to implement the plan will be necessary.

5.1 Implementation Measures

A number of actions are recommended as part of the implementation of this Trails Master Plan. These include the following:

- Develop a prioritization plan for trails in each city utilizing the new trail construction priorities outlined in the Trails Master Plan.
- Develop a trail promotion program which includes developing an Upper Santa Ana Wash Trails Plan website, trail brochures, links to SART-related, County, City of Redlands', and City of Highlands' web pages, and providing Preserve and trails information at activity centers such as community centers and parks. Utilize social media including Facebook, Twitter, YouTube, and blogs to inform, educate, and share pertinent information about Preserve resources, trail usage, restrictions, patrol/enforcement, access, and how to plan visits to the Preserve.
- Maintain the Cities' GIS-based trail map with parcel information so that the cities can track existing and required easements.
- Apply for grants and alternative funding sources for trails from various state and federal sources, particularly via local transportation organizations.
- Establish an "Adopt a Trail" program for ongoing trail construction, maintenance, and patrol activities.
- Coordinate the cities' trail system planning, implementation and management efforts with those of regional jurisdictions and public agencies.
- Identify partnership opportunities with neighborhood groups, private individuals, and local businesses as a means to acquire various trail amenities.
- Ensure that trails and bike lanes are included in plans for new transportation projects such as bridges and overpasses.
- Identify potential tax-related incentives and seek funding for implementation.
- Develop a basic maintenance plan for regularly scheduled activities such as monitoring and repairing trail washouts, unsafe conditions, and vandalism. Identify responsible parties or call numbers for reporting conditions that require immediate attention.

5.2 Governance Coordination

Implementation of the Trails Master Plan will require development of a governance structure to operate and maintain use of wildland trails within the Preserve. The matrix below lists various governance approaches to Preserve management activities. Figure 5-1 illustrates land ownership within the Preserve. All models allow use of volunteer services for some trail operation and maintenance functions (*e.g.* formation of a friends group, Redlands Conservancy)

Approach	Description	Advantages	Disadvantages
District Implements	District operates trail system and is responsible for Operations and Maintenance.	<p>District holds USFWS incidental take permit.</p> <p>District controls activities on District lands.</p> <p>Provides for District staff and other Memorandum of Understanding (MOU) entities' staff to work together.</p>	<p>District does not have LAFCO powers and would need to apply for them.</p> <p>Requires recreation modification of BLM MOU or additional agreement.</p> <p>Requires recreation modification to County Flood MOU or additional agreement by governing body.</p>
District facilities use agreement (License)	Trail operator/operators enter into a facilities use agreement (license agreement) with District for the wildland trail system.	<p>District maintains authority with power to revoke non-transferable license. Maintains ability to ensure trails are well managed.</p> <p>Allows flexibility in license issuance (<i>e.g.</i>, two cities, single city with other agreements, or non-profit).</p> <p>Flexibility, multiple options, (<i>e.g.</i>, flexibility of agreement including non-profits, cities, any type of entity; covering enforceability).</p>	<p>Not permanent.</p> <p>Conservation Trust; may require a Conditional Use Permit (CUP).</p> <p>Liability Transfer. License requires entity to provide leadership.</p> <p>Requires recreation modification of BLM MOU or additional agreement.</p> <p>Requires recreation modification to County Flood MOU or additional agreement.</p>
District joins Joint Powers Authority (JPA) with Redlands and Highland	District joins a JPA that operates wildland trails.	Institutional capacity to move toward implementation.	<p>JPA agencies would need to share at least one LAFCO service.</p> <p>Liability transfer/indemnification; less clean than license.</p> <p>Institutional overhead costs.</p> <p>Formulation costs for Agreements.</p> <p>Government entities exclusively participate.</p> <p>Requires recreation modification of BLM MOU or additional agreement.</p> <p>Requires recreation modification to County Flood MOU or additional agreement.</p>
District joins MOU with Redlands and	District joins a MOU with Redlands and Highlands that	<p>Lower formation costs.</p> <p>Broader than JPA – allows public/private/corporate non-</p>	<p>Politically more acceptable than JPA</p> <p>Indemnification may be an issue</p>

Approach	Description	Advantages	Disadvantages
Highland	identifies roles, responsibilities, operations and maintenance activities for the wildland trail.	profit entities to join.	Requires recreation modification of BLM MOU or additional agreement. Requires recreation modification to County Flood MOU or additional agreement.
Non-Profit Land Trust 501(c)3	District identifies a non-profit land trust that operates wildland trails.	Entities can be certified to hold easements. Entities can utilize an endowment rate investment vehicle. Other entities can contract for services from District and others, as needed. Board makeup could provide control and flexibility needed. Satisfy USFWS, CDFW, and LAFCO. Maximize local control and flexibility in implementation and management.	Very limited control after initial contract approval and renewals. Legislative and LAFCO approvals needed. Does not provide for funding at endowment yields. Requires recreation modification of BLM MOU or additional agreement. Requires recreation modification to County Flood MOU or additional agreement.
For Profit Organization	District enters into agreement with for profit organization for operation of wildland trail system.	Pro acquisition. Revenue. Similar to license agreement.	Likely requires formation of new for profit enterprise by others who are not currently stakeholders in Wash Plan. Requires recreation modification of BLM MOU or additional agreement. Requires recreation modification to County Flood MOU or additional agreement.

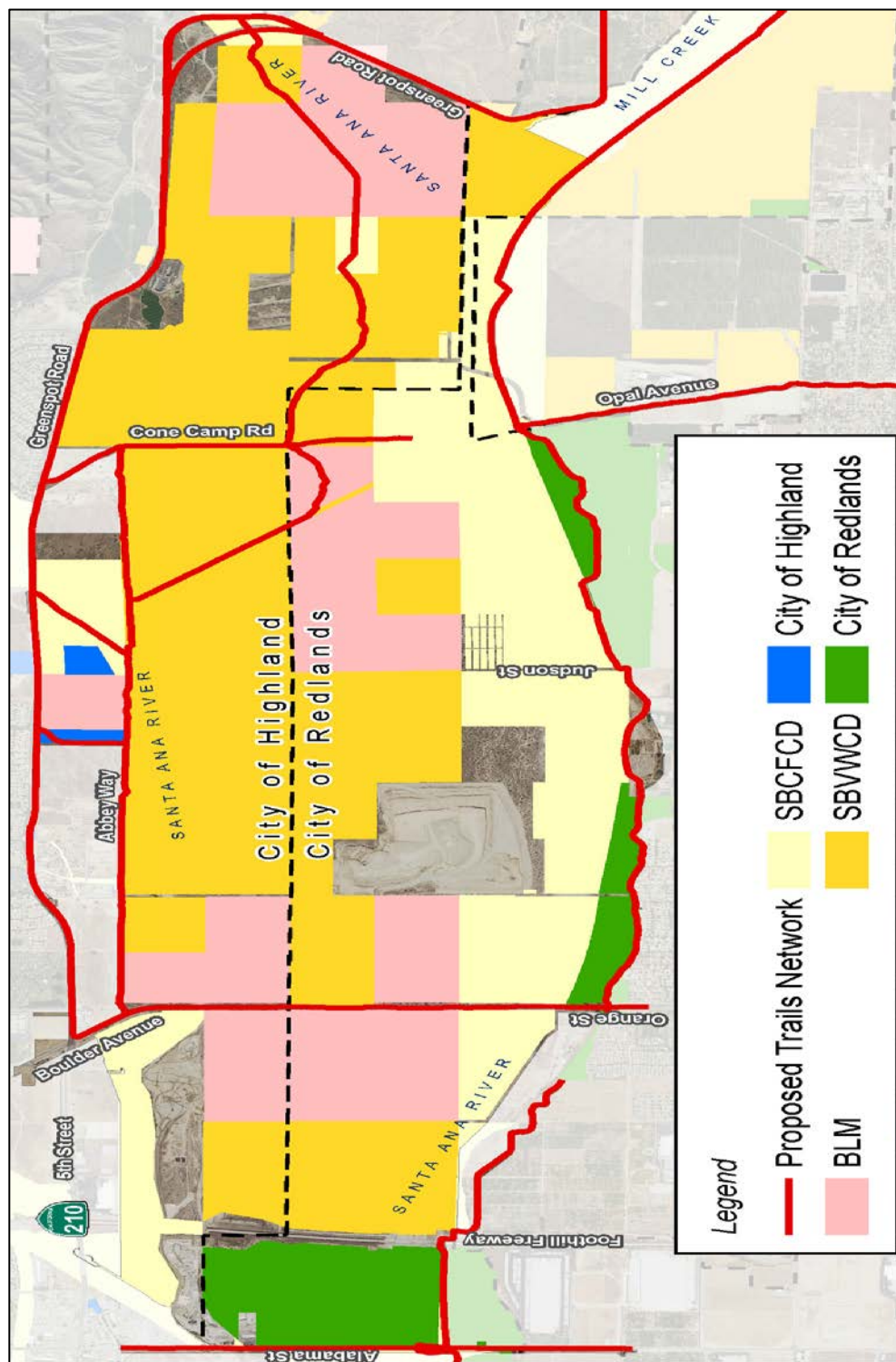


Figure 5-1 Land Ownership

5.3 Timeline (Cost Dependent)

The project can be divided into three phases, which would be:

Phase 1) Implementation of the Trails Plan

- Phase 2 Public opening and improvements to trail system
- Phase 3) Ongoing maintenance and long-term improvements to trails system

Phase	Priority	Short-term (0-2 years)	Intermediate (3-5 years)	Long-Term (5+ years)	On-going
1	1 Adoption of Trails Plan by District	<input type="checkbox"/>			
	2 Development of governance structure	<input type="checkbox"/>			
	3 Address implementation agreements (<i>i.e.</i> Flood, WSPA, FWS, CA DFW)	<input type="checkbox"/>			
	4 Develop financing plan	<input type="checkbox"/>			
	5 Implementation/phasing plan	<input type="checkbox"/>			
2	6 Prepare system for use (signage etc.)		<input type="checkbox"/>		
	7 Install amenities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	8 Establish an “Adopt a Trail” or friends programs	<input type="checkbox"/>	<input type="checkbox"/>		
3	9 Implement ranger program			<input type="checkbox"/>	<input type="checkbox"/>
	10 Develop WSPA/ river crossing			<input type="checkbox"/>	<input type="checkbox"/>
	11 Develop inspection and priorities			<input type="checkbox"/>	
	12 Continue discussions about potential improvements to the trails system, including regular plan updates				<input type="checkbox"/>

5.4 Trail Facility Cost Estimate

The trail facility cost estimate below provides rough-order-of-magnitude costs for planning purposes. Actual costs will be revised to reflect construction units and labor costs during preparation of bids.

	Number of Units	Material Cost per Unit	Labor	Total Cost
Ancillary Trail Facilities and Amenities				
Bench	3	\$650.00	\$1,950.00	\$3,900.00
Crosswalk	1	\$2,600.00	\$3,250.00	\$5,850.00
Parking	0	-	-	-
Pet Waste Bags	5	\$390.00	\$650.00	\$2,600.00
Rest Area	2	-	-	-
Restroom	0	-	-	-
Waste Receptacle	4	\$650.00	\$520.00	\$3,120.00
Total				\$15,470.00
Signage				
Habitat Protection (WSPA)	2	\$390.00	\$780.00	\$1,560.00
Identification	3	\$650.00	\$1,170.00	\$3,120.00
Orientation				
Directional Sign	8	\$390.00	\$3,120.00	\$6,240.00
Map	3	\$650.00	\$1,170.00	\$3,120.00
Regulations	3	\$650.00	\$1,170.00	\$3,120.00
Safety & Hazards				
Basin Structures	2	\$390.00	\$780.00	\$1,560.00
Flash Flood	6	\$390.00	\$2,340.00	\$4,680.00
General Advisories	3	\$650.00	\$1,170.00	\$3,120.00
Rattlesnakes	2	\$390.00	\$780.00	\$1,560.00
Road Hazard	1	\$390.00	\$390.00	\$780.00
Rock Climbing Hazard	4	\$390.00	\$1,560.00	\$3,120.00
Interpretive	4	\$650.00	\$1,560.00	\$4,160.00
Total				\$36,140.00
Signs	13	\$1,300.00	\$19,500.00	\$36,400.00
Barriers	2	-	\$19,500.00	\$19,500.00
WSPA Crossing	1	\$1,300.00	\$19,500.00	\$20,800.00
Total				\$128,310.00

These cost estimates were computed by using the average catalog price for items. Labor costs are estimated. The labor cost calculations are based on the number of hours to complete, as well as the equipment that would need to be used for the work. A 30 percent contingency was added to these preliminary estimates. Refer to Appendix E – Preserve Management Activities for cost details related to wildland trails and habitat protection.

5.5 Conditional Use Requirements

Endangered species impacts resulting from the footprint of the trail are covered in the Wash Plan as a covered activity having no significant impacts on species beyond those associated with road maintenance. There are specific impacts associated with the SART and these impacts are quantified. Species impacts related to the use of the trails have not yet been calculated. The use of the trail system is therefore considered “provisional”. The operator of the trail system would need to make an application to the FWS to amend the Wash Plan so this use would be permitted. Cost estimates for these operational activities have been included within the plan (Section 6.3).

5.6 Adopt-a-Trail Program

An Adopt-a-Trail Program can be useful toward maintaining an operational trails system by coordinating volunteers and events to assist jurisdictions in monitoring trail use and conditions. Volunteers can be trained to report back to the cities and District on the following: Maintenance needs, improvements, habitat and safety issues, trail conditions, prioritizing maintenance needs requiring immediate versus long-term attention, and organizing periodic maintenance days to improve the trail environment. Adopt-a-Trail programs are a cost efficient solution to keep existing trails clean, accessible, and safe and may serve as an effective tool for enabling the development of new trails. These programs also develop a “pride of ownership” within the community.

5.7 Evaluation and Monitoring

The District, Cities, and County, as operator of the SART, should work with local communities and advocacy organizations to establish performance measures to benchmark progress toward achieving the goals of this Trails Master Plan. These performance measures should be reported within one to two years following implementation of the Plan and public use of the trails. The Evaluation and Monitoring Report should discuss opportunities that are created through performance measures, such as the ability to track trends in pedestrian and bicycle use and safety over time, present this information to policy makers, cite accurate inventories of the quantity and quality of facilities during planning and analysis tasks, and describe the characteristics and needs of pedestrians and bicyclists in the community. The report should also discuss challenges, such as the cost of data collection and reporting, accuracy of data, and how to establish realistic performance targets for pedestrian and bicycle improvements. Baseline data should be collected as soon as the performance measures are established. The performance measures can address the following aspects of pedestrian and bicycle transportation and recreation in the Wash Plan area:

Usage: Number of bicyclists or pedestrians on on-road and off-road facilities.

Safety: Number and type of pedestrian/bicycle crashes or injuries.

Facilities: Number and type of pedestrian and bicycle facilities available and the quality of these facilities.

Education/Enforcement: Number of people educated or ticketed as a part of a bicycle and pedestrian safety campaign.

Institutionalization: Total budget spent on bicycle, pedestrian, and greenway projects and programs and municipal employees receiving bicycle facility design training.

Cost: Total cost of pedestrian and bicycle facilities per mile or per user.

The District, Cities, and County will benefit from this on-going monitoring and evaluation process which can be adapted based on reporting results and lessons learned.



Section 6

Operations and Management

6.1 Overview / Guiding Principles

Multi-use trail in the Santa Ana River Bed will be designated to accommodate hikers and mountain bikers, however permanent changes to the river bottom to increase access will not be permitted. Generally, trails of this type are not able to accommodate users with disabilities as the crossing will be uneven, rocky and require some climbing. The guidelines for accessible multiuse trails are, for the most part, the same as those for accessible hiking trails. The following is recommended to be considered when designing multi use trails in this plan:

Width: Typically, multiuse trails range from 12 feet to 14 feet wide. The optimum trail bed or trail tread width is 8 feet to 10 feet.

Grade: Multi-use trails that are used by both hikers and mountain bikers should be designed with moderate grades. The recommended slope for multi-use trails is 1:10 (10 percent). This slope can go up to 1:5 (20 percent) maximum for short spans along the trail.

Edge Protection: Multi-use trails should consider the safety needs of trail users. Some types of edges can be hazardous to bikers. Vegetation along trail edges should be cleared between 2 to 5 feet on either side of the trail.

6.2 Patrolling

Regular patrol of the trails by paid staff and volunteers will be essential to assess conditions which may impact the immediate safety of visitors and to identify damage to the resource and impacts to Covered Species. Specifically, identify evidence of motorized vehicles or bicycles outside of permitted areas, any off-trail use, intrusion by domestic animals or invasive species, and identify trail deterioration, evidence of erosion, excess sediment deposition or other habitat destruction. The Preserve Trail Master Plan requires that trail use be limited to authorized trails and that non-administrative off-trail travel will be not permitted. Local ordinances will be adopted to provide enforceability. It is expected that patrols of Preserve wildland trails will occur under the direction of the Conservation District, Redlands, and Highland. The SART will be patrolled by San Bernardino County code enforcement.

Patrols will take place throughout the trail system multiple times per week. Patrol objectives include:

- Discouraging off-trail use
- Monitoring for wildfire or other fire
- Monitor and report any trail damage that requires trail repair
- Pick-up and remove trash

- Report signs of vandalism or other illegal activities
- Promote responsible trail use through information and education
- Maintain public safety, through education and citation
- Respond to emergency situations

6.3 Routine and Remedial Maintenance and Operations

Consistent with the Habitat Conservation Plan, limited maintenance of the trails would be provided as either part of the road maintenance program, in the case of trails on existing roadways, or as part of the regular maintenance activities associated with water management in the Wash. Trails must be inspected regularly for safety. Riding and hiking trails need to have even surfaces. All trails are to be kept at least 10 feet wide at all times. Trail surfaces are to be inspected annually and after large storms. Routine maintenance includes trash/debris removal, incidental repairs to eroded trails, preventative erosion control (such as sand bags, water bars, rolling grade drips, and spoons) and weed management. If the trail is also used as a maintenance road, it should be designed to allow for adequate drainage.

Routine and remedial maintenance activities are described below.

Maintenance Activity	Description	Maintenance Frequency
Empty trash cans along trails	Trashcans will be near trailheads and will need to be emptied so that trash stays off of the trails.	Weekly
Refill pet waste bags	Pet waste dispensers will be located throughout the trails system and will need to be refilled when they become empty.	Every month
Maintenance of informational signs	Informational signs will be located at each of the staging zones. These signs will need to be maintained and repaired so that the public will always have access to them.	1 time every 3 months
Updating information in informational kiosks	Information will be located at the informational kiosks at the staging areas. This information will need to be kept up to date so all hikers are aware of current conditions on the trail network.	Weekly
Installations of signs	Signs will need to be installed to warn hikers of hazards and let them know where not to enter. Signs will also be used to guide hikers through the trail network.	As needed
Repair/Maintenance of signs	Repair and maintenance on signs should take place as needed. Signs should be visible and easy to see at all times.	As needed
Removal of invasive species	Invasive species removal will take place periodically to make sure no trails are blocked or obscured.	Annually
Recovery from acts such as vandalism or dumping	There is a possibility that vandalism and dumping of trash may take place on the trail networks. Maintenance will include repairing and or replacing anything that is damaged in such acts.	As needed
Grade non-asphalt trail	Trails should be maintained so that hikers and bikers can travel easily. This includes grading, resurfacing, and filling potholes on trails.	As needed
Patrol	Trails will need someone to be responsible for providing public safety, park information and protecting properties within the Wash Plan Area. Will be determined by governing entity.	Every few days

6.4 Cost of O & M

Maintenance Activity	Cost	Frequency	Frequency/ Year	Yearly Cost
Empty trash cans along trails	\$195.00	Every week	52	\$10,140.00
Refill pet waste bags	\$260.00	Every 3 months	4	\$1,040.00
Sign Replacement	\$1,300.00	1 Sign/Year	1	\$1,300.00
Updating information in informational kiosks	\$130.00	Every month	12	\$1,560.00
Installations of signs	\$260.00	Every 2 years	0.5	\$130.00
Removal of invasive species	\$1,040.00	Every 2 months	6	\$6,240.00
Recovery from acts such as vandalism or dumping	\$650.00	Every 2 weeks	26	\$16,900.00
Grade non-asphalt trail	\$13,000.00	Every 2 years	0.5	\$6,500.00
Patrol- specifically for safety and habitat protection	\$780.00	Every week	52	\$40,560.00
Total				\$84,370.00

These cost estimates are estimates and were computed by using average estimated labor and costs. They are intended to be illustrative of order of magnitude costs for planning purposes. Estimates will be more fully developed as trail system implementation agreements are developed.. The labor cost calculations are based on the number of hours to complete, as well as the equipment needed for the work. A 30 percent contingency was added to these preliminary estimates. Refer to Appendix E – Preserve Management Activities for cost details related to wildland trails and habitat protection.

6.5 Approvals

The Trails Plan may require adoption by all parties involved in the management, operations, and maintenance of the ecological preserve and/or trail activities. These parties may include the Cities of Redlands and Highland, County of San Bernardino, SBVWCD, USFWS, CA DFW and BLM. The parties may choose to adopt an MOU that incorporates all or portions of this plan.

6.6 Regulatory Requirements

The Trails Master Plan is required under the Wash Plan, related Habitat Conservation Plan, NEPA/CEQA, and ESA-related permitting. Key drivers include avoidance of impacts to endangered species and protected habitat, namely, the Woolly Star Preserve Area, San Bernardino kangaroo rat, and other listed species described earlier in the document. As such, the



Trails Plan must be consistent with the measures outlined in the regulatory documents as they pertain to trail usage.

Refer to Appendix B for a description of impacts associated with each proposed trail. For additional information related to impacts of recreational trail users on the San Bernardino kangaroo rat, refer to

Appendix C. Proposed mitigation to lessen trail impacts are described in Appendix D. For information on Preserve management activities and costs, refer to Appendix E.

Appendix A

Flood Memorandum

To: Wendy Katagi, Stillwater Sciences

From: Ted Johnson, CDM Smith

Copy: Juan Ramirez, CDM Smith; Kim Drake, CDM Smith; Kate Stenberg, CDM Smith

Date: June 10, 2016

Subject: Santa Ana River Wash Floodplain Analysis

The San Bernardino Valley Water Conservation District Wash Trail Plan covers an alluvial outwash plain between the Cities of Redlands and Highland where the following stream channels converge to form the Santa Ana River:

- Santa Ana River
- Mill Creek
- Oak Creek
- Plunge Creek
- City Creek
- Two minor urban drainage ways that flow south through the City of Highland, one tributary to City Creek and the other tributary to Plunge Creek

In the convergent Wash area, the creeks form a braided system of ephemeral drainage channels that deposit sediment as they outfall from the San Bernardino Mountains. Associated with this drainage system is a regulatory floodplain under the jurisdiction of the Federal Emergency Management Agency (FEMA), San Bernardino County, and Cities of Redlands and Highland. These jurisdictional agencies have mapped the 100- and 500-year floodplains, as well as the 100-year floodway. The most recent available data for floodplains and floodway are illustrated in Figure 1. In this figure the 100- and 500-year floodplains are represented by the blue and tan shading, respectively; and, the 100-year floodway represented by the red/blue hatching. The grey/tan hatching are former flood-prone areas protected by a levee system. The blue lines in the Figure are drainage flow paths based on the USGS National Hydrographic Dataset. These lines indicate the braided nature of the flow paths through the Wash area. The floodplains and floodway indicate the high degree of risk from flooding throughout the Wash area. The San Bernardino County Flood Insurance Study indicates that the 100-year flow for the Santa Ana River in this area is 113,000 cubic feet per second (cfs). However, this flow extends 14 miles downstream to Warm Creek where it increases to 180,000 cfs. As the Wash is near the upstream extent of the River, the

100-year flow may be much less. These maps may be revised as the operations plan for Seven Oaks Dam is further refined.

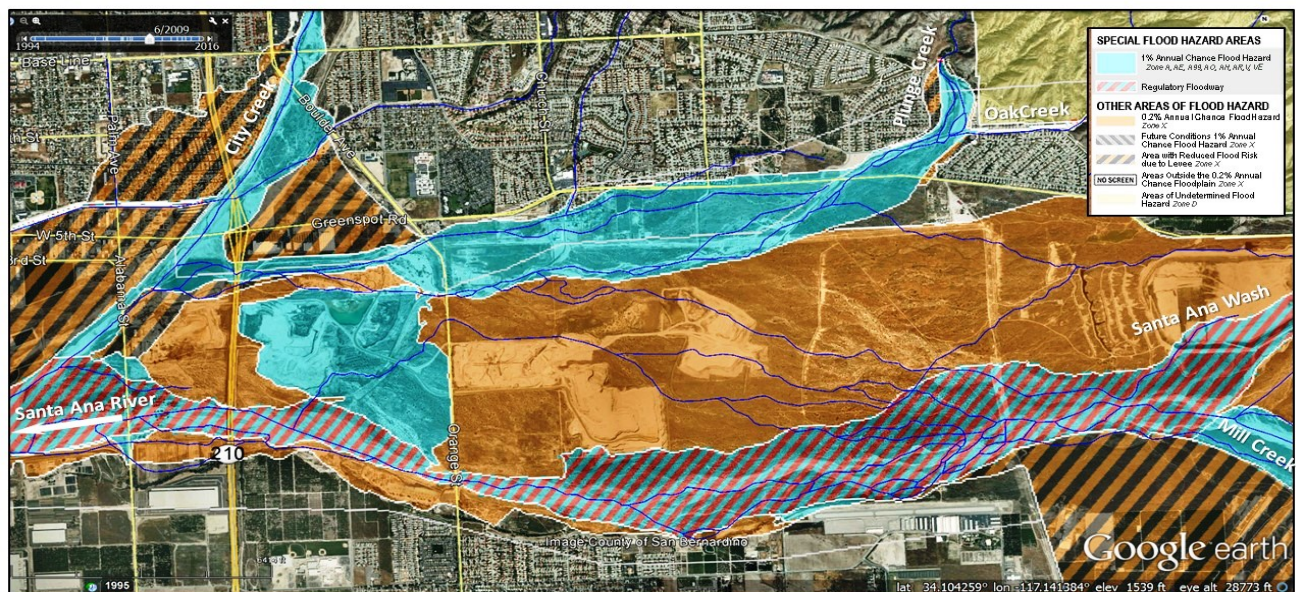
In addition to a high flood hazard on the site, the Wash is also a zone of high sediment deposition, as evidenced by the sand and gravel mining and its location at the foot of the San Bernardino's. Sediment deposition does not necessarily pose a hazard to area visitors or users, unless they are caught in a mud flow, but it can pose a maintenance challenge to trail facilities. After flooding, trails and facilities may need to be cleaned of sediment deposits.

Visitors to and users of the Wash trail systems should be informed of the flood hazard present in the area through educational and warning signs. An effective approach is to provide signs with posts that indicate the depth of flooding for various flood events and the need to avoid entering or trying to cross areas of flowing water, debris and mud. Water 1-foot deep flowing at 1 foot per second can sweep adults of their feet. Warning signs should also be installed on roads crossing the Wash.

Examples of signage used to warn of flood hazards



Figure 1 Santa Ana Wash Floodplains, Floodway and Outfall Channels



Appendix B

Trails Impacts Matrix

No.	Trail Name	Class Designation	Existing Resources (e.g., listed species, suitable habitat, trail conditions)	Impacts by User Group					Operations: Patrol, enforcement, management measures	Avoid Impacts to ESA
				General	Pedestrians, Hikers, Dog Walkers	Bicyclists, Mountain Bikers	Equestrian	Skateboarders		
1	Alabama Street	2	Currently developed as paved street; on the edge of the preserve - boundary line trail; not currently critical habitat but does have concentration of Woolly Star near alignment about south central. Mining proposed adjacent to north half. Connects to bike path on north and SART alignment on south. K-Rat south central - similar areas as Woolly Star. Bus route access near north terminus.	<ul style="list-style-type: none">Occasional maintenance activities cause ongoing disturbance from noise and heavy equipment activityPermanent loss of habitat and damage to K-Rat and Woolly Star from construction footprint and associated construction noiseK-Rat near existing streetTwo tracks (one minor, one major) take off to the east from the street, which attracts users into preserve on non-authorized routes	Not suitable; road includes vehicular and bike lanes only	<ul style="list-style-type: none">Minimal impacts after construction if users stay within street / trail alignmentAttract users off paved trail?	Not suitable	Minimal impacts after construction if users stay within street / trail	Implementation of patrol/enforcement, signage/education, fencing/vegetation buffer measures to avoid conflicts between wildlife and trail users. Other measures include litter receptacle; dog waste receptacle	The Trail Plan includes a:

No.	Trail Name	Class Designation	Existing Resources (e.g., listed species, suitable habitat, trail conditions)	Impacts by User Group					Operations: Patrol, enforcement, management measures	Avoid Impacts to ESA
				General	Pedestrians, Hikers, Dog Walkers	Bicyclists, Mountain Bikers	Equestrian	Skateboarders		
2	Borrow Pit South Rim	1/1-B and 4	Partially paved, partial dirt road along edge of borrow pit; current and proposed water recharge activities along north edge of trail alignment. Concentrations of Woolly Star near west end of borrow pit close to alignment. Occasional maintenance traffic along alignment already. Would require Cone Camp Trail to be completed to connect - approval of this trail drives other trail access. Some known K-Rat to south of trail alignment - but not dense and may be an adequate distance away. Most of the alignment would act as a boundary trail even though it extends into the center.	<ul style="list-style-type: none">Occasional maintenance activities cause ongoing disturbance from noise and heavy equipment activityMost of alignment would act as a boundary trail with minimal impact, but because it dead ends in the center of the preserve, it would drive the use and completion of the Cone Camp Trail bringing more users to the center of the preserveIf construction needed, could result in permanent loss of habitat for K-Rat due to noise and construction footprint/activities	<ul style="list-style-type: none">Dogs generate a larger buffer of impacts that extends beyond the trail (effect of dogs on small mammals may extend up to 50m)	Minimal impacts after construction	Horses are somewhat less disruptive than mountain bikes; except that horses may spread invasive plants into sensitive Woolly Star areas and given that the trail comes to the center of preserve, impacts may be greater than expected.	Not suitable	Implementation of patrol/enforcement, signage/education, fencing/vegetation buffer measures to avoid conflicts between wildlife and trail users. Other measures include litter receptacle; dog waste receptacle	1. Patrol section which details the type and frequency of patrols including periodic patrols of the area by law enforcement personnel; Regular patrol of the trails by paid staff and volunteers will be essential to minimize damage to the resource and more specifically impacts to Covered Species from off-trail use. The Preserve Trail Plan will require that trail use be limited to authorized trails and no non-administrative off-trail travel will be permitted. Local ordinances will be adopted to provide enforceability. It is expected that patrols of Preserve trails will occur under the direction of the Conservation District, Redlands, and Highland. The SART will be patrolled by the San Bernardino County code enforcement.

No.	Trail Name	Class Designation	Existing Resources (e.g., listed species, suitable habitat, trail conditions)	Impacts by User Group					Operations: Patrol, enforcement, management measures	Avoid Impacts to ESA
				General	Pedestrians, Hikers, Dog Walkers	Bicyclists, Mountain Bikers	Equestrian	Skateboarders		
3	Boulder Avenue / Orange Street	2	<p>Boulder Ave /Orange Street is an existing paved two lane street with a bridge over the Santa Ana River and Plunge Creek. Google maps shows bus stops at both bridges although there are no services or other developments at either location. There is a powerline that parallels the west side of the street alignment and numerous dirt roads that extend off from the street in both directions. Many of these appear to be used by off-road vehicles, motorcycles, or mountain bikes based on track patterns observed from aerial photos. Crosses through the Woolly Star preserve and through an additional area targeted for habitat values along the southern portion of the alignment. There are high habitat values on both sides of the alignment and along the full length with numerous known Woolly Star and spineflower and K-Rat locations with the exception of the entrance to the mining operations. However, it appears that the Wash Plan designates much of the northern portion of this habitat for future mining. Trail alignment would connect to SART on the south and other existing and proposed routes on the north.</p>	<ul style="list-style-type: none">• Occasional maintenance activities cause ongoing disturbance from noise and heavy equipment activity• Construction of trail included as part of road widening—resulting in permanent habitat loss• Construction impacts would likely be less than expected because of the existing road impacts even though the alignment goes through critical habitat areas• Trails plan shows a rest area south of the Santa Ana River which would align with the SART and would not have significant impacts on the habitat values	<ul style="list-style-type: none">• Connections to other east-west trails that cater to pedestrians may influence an increase in pedestrians in this corridor as well• Given the mining generated truck traffic on the alignment, if there is no separated pathway, pedestrian use may not increase as much as expected• If the bicycle path design invites pedestrians and dog walkers, then the intersecting dirt tracks may be inviting to these users and the potential for impacts could extend far into the preserve	Addition of more bicycle users is not likely to be a significant impact	Not suitable	Minimal impacts after construction	Implementation of patrol/enforcement, signage/education, fencing/vegetation buffer measures to avoid conflicts between wildlife and trail users. Other measures include litter receptacle; dog waste receptacle	2. Local ordinance(s) prohibiting unauthorized off-trail travel, providing provisions for temporary or permanent trail closures in the event of resource damage, and providing enforcement authority for violations;

No.	Trail Name	Class Designation	Existing Resources (e.g., listed species, suitable habitat, trail conditions)	Impacts by User Group					Operations: Patrol, enforcement, management measures	Avoid Impacts to ESA
				General	Pedestrians, Hikers, Dog Walkers	Bicyclists, Mountain Bikers	Equestrian	Skateboarders		
4	Cone Camp Road	1/1-B	<p>Very wide dirt road and impacted zone - impacted vegetation is much wider than existing maintenance road. Periodic installations of EBX II and Inland Feeder Pipeline. Trail sits within easement for both pipelines and will need access by San Bernardino Valley Municipal Water District and Metropolitan for potential repair. Trail is only covered up to the Woolly Star preserve area, WSPA crossing and river crossing are shown separately in Wash Plan and not covered, should be potentially separated out as a different number with different impacts. There would still need to be access for maintenance vehicles for the flood control district access and access to whatever the installation is along the alignment. Crosses right through the Woolly Star preserve area and known concentrations of Woolly Star and spineflower - along south central portion of alignment - north of river. Conservation lands proposed on both sides of southern half; water recharge on both sides of northern half. K-Rat known on both sides within the Woolly Star preserve portion. Connects through; although does not connect directly to other existing trails - would depend on connections along other streets/trails around border.</p>	<ul style="list-style-type: none">• Occasional maintenance activities cause ongoing disturbance from noise and heavy equipment activity• There would be significant construction impacts including permanent loss of habitat and construction activity and noise• Paved trail will separate K-rat populations and fragment habitat.• Need to also account for space lost to "rest areas" and for additional activity in these locations• Need to identify potential locations for rest stops• The existing maintenance road wanders some, but is frequently along the western edge of the disturbed area. Also intersects with other dirt tracks that extend to the east and west - potentially drawing people into closed areas• Currently crosses river at grade, impassible when flooded; proposal is to build a bridge, which have many other impacts• Located within Woolly Star preserve and area of known K-Rat occurrence• Bridge construction permanent habitat loss and disturbance of land around bridge• In the Wash environment, bridge will also disrupt sediment and bed load flows even if very wide (expensive). Constriction at bridge will affect up and downstream areas - upstream sediment will drop out sooner burying Woolly Star and K-Rat habitat, downstream the river will pick up new bed load and erode Woolly Star and K-Rat habitat• Alignment to the western edge of currently disturbed area will impact the west side habitats more than to the east; more land to the west is proposed for conservation management than to the east	<ul style="list-style-type: none">• People stop and take stock of surroundings and may be more likely to go off-trail• Maps showing location of pet waste bags at either end of this segment give dog walkers implicit permission to enter the area with dogs; because of the very wide swath of existing disturbance, the impact of dogs may be less than expected IF the trail is centered within the disturbed area• Presence of dogs can disturb and displace small mammals up to 50m from trail edge if on-leash. Off-leash dogs can roam and expand impacts much further.• Left-over construction disturbance will create new areas that appear more open and draw people down to	<ul style="list-style-type: none">• Mountain bikes will be tempted by intersecting dirt tracks and expand impacts well beyond trail alignment	<p>If not paved, may be more suitable for horses, except for associated impacts to sensitive Woolly Star habitat</p>	<p>Not suitable</p>	<p>Implementation of patrol/enforcement, signage/education, fencing/vegetation buffer measures to avoid conflicts between wildlife and trail users. Other measures include litter receptacle; dog waste receptacle</p>	<p>3. Sign plan with informational, interpretive, regulatory and directional signs;</p>

No.	Trail Name	Class Designation	Existing Resources (e.g., listed species, suitable habitat, trail conditions)	Impacts by User Group					Operations: Patrol, enforcement, management measures	Avoid Impacts to ESA
				General	Pedestrians, Hikers, Dog Walkers	Bicyclists, Mountain Bikers	Equestrian	Skateboarders		
					the river in new places creating new areas of disruption • Bridge will separate people from the river encouraging them to go around the abutments and down to the river alongside the bridge - resulting in wider impacts.					
5	Greenspot Road	2	Existing paved road; follows the northern and eastern perimeters of the preserve. Residential neighborhoods, developed parks (Aurantia Park), orange groves (slated for development?) and some undeveloped habitats on the north side of the road. On the south side of the road there are the Wash lands and connections to several unnamed and named trails/roads/access points into the Wash. At southeast end of Greenspot Road - intersection of Greenspot and Florida, the route is very close to the SART on the other side of Mill Creek (potential bridge location?). Along the northern side, there are already striped bike lanes in place, so improvements would have little impact. As the road wraps around the eastern end of the Wash area, the road is narrower.	<ul style="list-style-type: none">• Occasional maintenance activities cause ongoing disturbance from noise and heavy equipment activity• Permanent loss of habitat areas - particularly on eastern end of roadway• This is generally an area of less well documented resources, so impacts could be minimal• Alignment would use existing bridge over Santa Ana River, but might need a new bridge to connect to SART (See Cone Camp Road for concerns about new bridges)	Minimal impacts	Minimal impacts	Not suitable	Minimal impacts	Implementation of patrol/enforcement, signage/education, fencing/vegetation buffer measures to avoid conflicts between wildlife and trail users. Other measures include litter receptacle; dog waste receptacle	4. Access section including barricades, gates and/or fencing to deter motorized and other unauthorized uses and plans for informational kiosks/signs at trailheads to inform visitors about safe and appropriate trail use;

No.	Trail Name	Class Designation	Existing Resources (e.g., listed species, suitable habitat, trail conditions)	Impacts by User Group					Operations: Patrol, enforcement, management measures	Avoid Impacts to ESA
				General	Pedestrians, Hikers, Dog Walkers	Bicyclists, Mountain Bikers	Equestrian	Skateboarders		
			K-Rat sightings and Woolly Star close to alignment on southeast end - between Santa Ana River and Mill Creek. Critical habitat south of northern portion between approximately Cone Camp Road/Greenspot Road intersection and Weaver St/Greenspot Rd intersection. Plunge Creek passes through this segment. This segment is also adjacent to a portion of the Woolly Star Preserve and other lands with conservation easement and City of Highland mitigation areas. Northern segment already designated as a bike path with separate striped lanes. Orange groves are slated for development.							
6 & 7	Old Greenspot Road (and Horse Trails)	1/1-B and 4	Old Greenspot Road is old road barricaded against vehicle traffic south of Santa Ana Canyon Road and crosses the Santa Ana River on a pedestrian bridge. Loop is further east than current Greenspot Road and rejoins the current road at the pumping station south of the river. Although not shown on the trails plans there is a short paved section that connects from the old Greenspot Road to the west to the Borrow Pit South Trail. If horses are not to be allowed on the Borrow Rim Trail, some additional barricading between Greenspot Road and Old Greenspot Road would be needed.	<ul style="list-style-type: none">Occasional maintenance activities cause ongoing disturbance from noise and heavy equipment activityProposal is to remove a portion of the pavement to create a horse trailSimilar potential impacts related to construction noise and activity; although there does not appear to be as many sensitive resources in this area—potentially due to lack of survey effortHabitats should be confirmedAlthough not shown on the trails plans, there is a short paved section that connects from the old Greenspot Road to the west to the Borrow Pit South Trail	Minimal impacts after construction	Bicyclists maybe encouraged to go down the Borrow Pit South Trail that ends at the Cone Camp Trail, which may not be as suitable for bicyclists; but if the road dead ends there, they will use Cone Camp	Segment is short and it is not clear where horseback riders would originate or go to	Not suitable if a portion of the pavement is removed for horses	Implementation of patrol/enforcement, signage/education, fencing/vegetation buffer measures to avoid conflicts between wildlife and trail users. Other measures include litter receptacle; dog waste receptacle	5. Trail maintenance plan and schedule detailing the frequency and methods of trail maintenance;

No.	Trail Name	Class Designation	Existing Resources (e.g., listed species, suitable habitat, trail conditions)	Impacts by User Group					Operations: Patrol, enforcement, management measures	Avoid Impacts to ESA
				General	Pedestrians, Hikers, Dog Walkers	Bicyclists, Mountain Bikers	Equestrian	Skateboarders		
8	Old Rail Line	4	Dirt track more well defined than other tracks and drainages extending off of it into the Wash area. Much of the length is described as surfaced with crushed lava and slightly raised above the surrounding terrain. Southern end loops to the east to connect to the Cone Camp Trail alignment and the north end connects to the Pole Line Trail. Goes through a heavy concentration of Woolly Star. Low density of K-Rat currently.	<ul style="list-style-type: none">Occasional maintenance activities cause ongoing disturbance from noise and heavy equipment activityBecause this route is internal to the preserve, it would require the trails at either connecting end to also be developed for this trail to be useable; the impacts of the network are greater than the impact of the single trail segment.Even if the north and east connecting trails are developed, additional cross preserve trails will fragment habitat and introduce human activity into areas that might not otherwise be disturbed into the futurePotential long term permanent impactsSouthern end of rail line merges with a maintenance road and extensive efforts would be required to direct users to the east to Cone Camp Road and prevent access to the south into more sensitive areas; this could become an ongoing issueSimilarly, at the north end, there is a well-defined turn off to a maintenance road for the recharge areas that will be attractive to recreationists, taking them further into the center of the preserve and into sensitive areasTrail will also have issues with erosion that will require ongoing maintenance	<ul style="list-style-type: none">Presence of dogs can disturb and displace small mammals up to 50m from trail edge if on-leash. Off-leash dogs can roam and expand impacts much further.	Crushed gravel surface may deter mountain bikers as this is a very flat straight road and the crushed gravel will decrease their speed; in addition, it would become an important maintenance road during and after the construction of the new basins	Horses in this area would have the potential to introduce non-native weedy grasses and other plant species into the center of the preserve area and into areas currently supporting dense populations of Woolly Star	Not suitable	Implementation of patrol/enforcement, signage/education, fencing/vegetation buffer measures to avoid conflicts between wildlife and trail users. Other measures include litter receptacle; dog waste receptacle	6. Weed management plan to address the potential spread of invasive species along the trail route.

No.	Trail Name	Class Designation	Existing Resources (e.g., listed species, suitable habitat, trail conditions)	Impacts by User Group					Operations: Patrol, enforcement, management measures	Avoid Impacts to ESA
				General	Pedestrians, Hikers, Dog Walkers	Bicyclists, Mountain Bikers	Equestrian	Skateboarders		
9	Pole Line	4	<p>Pole Line Trail would follow existing dirt maintenance routes for electrical utilities and water conservation utilities. The alignment is immediately north of a heavy concentration of Woolly Star and K-Rat. Route extends from Orange Road to the east. Would need to cross a canal with no bridge, then crosses another with a bridge at Church Street. Follows Abbey Way, which is paved, for a short distance. Although the trail alignment is proposed to end at Cone Camp Trail, the maintenance road extends east all the way to Greenspot Road at the far end of the Wash. There are currently as many as 3 parallel alignments in this area indicating the ease with which new routes are cut through the habitat. Edison easement and Metropolitan Water District pipeline in area</p>	<ul style="list-style-type: none">• Occasional maintenance activities cause ongoing disturbance from noise and heavy equipment activity• Because there are currently 3 parallel routes, it will be difficult to contain users to only one route• The canal at the west end will need to be spanned, resulting in added expense and construction impacts; although it is currently a heavily disturbed area• Because the maintenance road extends to the east past Cone Camp Road, it will be difficult to prevent users from continuing east along the maintenance road• Similarly, the intersection of Old Rail Line trail and the Pole Line alignment will be difficult to control if both trails are not developed together; the impacts of the trail network would be greater than the individual segments.• Although habitats have been disturbed in this location, a new trail that would include rest areas could impact currently unimpacted areas• This alignment also bisects and isolates the northernmost portion of the preserve area	<ul style="list-style-type: none">• Presence of dogs can disturb and displace small mammals up to 50m from trail edge if on-leash. Off-leash dogs can roam and expand impacts much further. Dog walking in this area would need to be strictly controlled. Access to areas beyond the trail corridor would need to be strictly controlled.	Plunge Creek crosses the alignment and its open stream bed will be attractive to mountain bikers looking for off-trail experiences	Not suitable	Not suitable	Implementation of patrol/enforcement, signage/education, fencing/vegetation buffer measures to avoid conflicts between wildlife and trail users. Other measures include litter receptacle; dog waste receptacle	7. Long-term funding section including a non-wasting endowment for the operation and maintenance of the trail system; and
10	Santa Ana River	1	<p>Santa Ana River Trail (SART) alignment is south of the Santa Ana River and Mill Creek and would follow the perimeter of the preserve. There are some pockets of Woolly Star south of the river and very few K-Rat.</p>	<ul style="list-style-type: none">• Occasional maintenance activities cause ongoing disturbance from noise and heavy equipment activity• Although some segments would be new segments and involve new construction, the alignment is entirely south of the river and along the perimeter of the preserve• Construction would result in noise and activity related impacts, there would be some permanent loss of habitat• Connections with the SART will make north -south trail alignments more attractive and potentially increase usage through the preserve	Minimal impacts after construction	Minimal impacts after construction	Regional paved trail—thus, not suitable?	Minimal impacts after construction	Implementation of patrol/enforcement, signage/education, fencing/vegetation buffer measures to avoid conflicts between wildlife and trail users. Other measures include litter receptacle; dog waste receptacle	8. Measures to address any resource damage caused by on or off trail use.

No.	Trail Name	Class Designation	Existing Resources (e.g., listed species, suitable habitat, trail conditions)	Impacts by User Group					Operations: Patrol, enforcement, management measures	Avoid Impacts to ESA
				General	Pedestrians, Hikers, Dog Walkers	Bicyclists, Mountain Bikers	Equestrian	Skateboarders		
11	Weaver	4	Route follows a constructed drainage alignment and may have been originally part of the construction access or maintenance access. Connects Greenspot Road to the Pole Line Trail alignment. Has easy access from Aurantia Park into the Preserve trail system. It is located along the edge of areas identified as critical habitat and although it is along the edge of the identified preserve, there is undeveloped land to the west. The northern portion of the alignment bends through an area identified as a mitigation area. The Weaver Trail connection is not shown on most maps of proposed trails.	<ul style="list-style-type: none">Occasional maintenance activities cause ongoing disturbance from noise and heavy equipment activityAlthough this segment is technically along the perimeter, it bisects a large block of undeveloped habitat at the northern edge of the preserve and it provides an entry into the Pole Line Trail that does bisect and isolate the northernmost block of habitat in the preserveConstruction of a paved trail would require widening of the alignment and result in permanent habitat loss	Minimal impacts after construction Impacts of dogs on small mammals would apply; however, there are no known K-rat sightings in this part of the preserve, whether due to unsuitable habitat or lack of survey effort is not known.	Minimal impacts after construction	Not suitable	Not suitable	Implementation of patrol/enforcement, signage/education, fencing/vegetation buffer measures to avoid conflicts between wildlife and trail users. Other measures include litter receptacle; dog waste receptacle	
12	Plunge Creek	4	Along Plunge Creek stream, which has a wide alluvial fan Woolly Star Protection Area (WSPA) is adjacent to each side of Plunge Creek Several known K-rat burrows and sightings	<ul style="list-style-type: none">Occasional maintenance activities cause ongoing disturbance from noise and heavy equipment activityConstruction impacts on surrounding delicate environmentFloods with frequency and washes out the surrounding area—trail would be washed out at every large rain event	<ul style="list-style-type: none">Presence of dogs can disturb and displace small mammals up to 50m from trail edge if on-leash. Off-leash dogs can roam and expand impacts much further.Location in and adjacent to braided stream will prevent the establishment and maintenance of barriers to off-trail movements by pedestrians, and other users. This will result in ongoing impacts beyond the trail network.	<ul style="list-style-type: none">Location in and adjacent to braided stream will prevent the establishment and maintenance of barriers to off-trail movements by mountain bikers. This will result in ongoing impacts beyond the trail network.	Not suitable	Not suitable	Implementation of patrol/enforcement, signage/education, fencing/vegetation buffer measures to avoid conflicts between wildlife and trail users. Other measures include litter receptacle; dog waste receptacle	

Appendix C

Impacts of Recreation on Kangaroo Rats

Recreation may impact wildlife through the habitat alterations that occur from construction of facilities and from the activities of the recreational users. Although kangaroo rats have not been directly studied, the potential mechanisms of impacts may be inferred from studies on the impacts of recreation on small mammals.

Potential impacts fall into two broad categories: impacts on habitats and impacts on individuals. Both types of impacts have implications for populations.

Habitat impacts include:

- Forage removal – direct loss of forage plants and/or a reduction in preferred forage species through competition from introduced plants or a change in plant species composition to a less favorable species mix.
- Cover removal – direct loss of cover and/or a reduction in preferred cover.
- Loss of area – permanent conversion of land to non-habitat trail uses reduces the potential population size within the preserve.
- Habitat fragmentation – trails reduce the ability of animals to access different parts of their home range, to reach specific resources, or to find other members of the population. Habitat fragmentation can reduce genetic diversity; limit access to food and cover during critical seasons or years, thus reducing survival and reproduction.

Impacts on individuals may include:

- Direct mortality – individuals may be run over and killed by bikes moving at high speeds, maintenance vehicles, or by construction equipment that digs up occupied burrows. Individuals may also be at a greater risk of predation when crossing the large open gaps created by trails.
- Changes in behavior – construction noise and activity may disrupt normal behaviors near the activity. Pedestrians, bikes, and particularly dogs have been shown to result in non-lethal, fear-based alterations in behavior, habitat use, and physiology in wildlife including small mammals. Changes in behavior may lead to less successful foraging, reproduction, nurturing of young, or predator avoidance.
- Energy expenditure – disturbances lead animals to startle, stop foraging, and to use energy that may reduce their survival and fitness.
- Displacement – individuals may move to other areas or avoid the areas close to the trails where disturbing activities occur. Displacement can result in crowding and lowered

survival in occupied areas. The effect of displacement on populations is similar to “loss of area” under habitat effects.

- Increased competition – recreationists introduce trash and other food sources into natural habitats that may attract other species that may either then predate on kangaroo rats or outcompete them for limited resources (for example, if non-native rats were to increase in the preserve).

Where the primary objective is to provide habitat for species that otherwise might not thrive in anthropogenically altered environments, it is important to carefully consider the effects of introducing recreational trails and uses.

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Appendix D

Trail Mitigation Program

A trail mitigation program at the Wash Plan preserve area would be critical for the protection of its resources and to provide a safe and enjoyable experience for recreational trail users.

Mitigation is categorized into three types: construction; safety and accessibility; and, maintenance. Overall, these measures aim to lessen the impacts of the Wash Plan Trails system on natural habitat, improve visitor safety and experience, and reduce management resource needs.

Patrol

Regular patrol of the trails by paid staff and volunteers will be essential to assess conditions which may impact the immediate safety of visitors and to identify and minimize damage to the resource and impacts to Covered Species. Specifically, identify evidence of motorized vehicles or bicycles outside of permitted areas, any off-trail use, intrusion by domestic animals or invasive species, and identify trail deterioration, evidence of erosion, excess sediment deposition or other habitat destruction. The Preserve Trail Plan requires that trail use be limited to authorized trails and that non-administrative off-trail travel will be not permitted. Local ordinances will be adopted to provide enforceability. It is expected that patrols of Preserve trails will occur under the direction of the Conservation District, Redlands, and Highland. The SART will be patrolled by the San Bernardino County code enforcement.

Patrolling will take place throughout the trail system multiple times each week. Patrol objectives include:

- Discouraging off-trail Travel
- Enforcing no fire rules
- Monitor and report any trail damage that requires repair
- Pickup/remove trash
- Report signs of vandalism or other illegal activities
- Promote responsible trail use through information and education
- Maintain public safety
- Respond to emergency situations
- Patrol- a few days/week

Maintenance Activity	Description	Frequency	Cost	Frequency/Year	Yearly Cost
Patrol	Trails will need someone to be responsible for providing public safety, park information and protecting properties within the Wash Plan Area.	Every few days	\$ 780	52	\$ 40,560

Construction

The following mitigation measures would minimize the degree and/or severity of adverse effects during construction, as needed.

- Use of soil stabilizers that would not contain toxic substances
- Revegetate and re-contour disturbed areas, as necessary
- Ensure no interference with natural processes, such as the seasonal migration of wildlife
- Erosion-control and sediment-control best management practices (BMPs) along trail alignments (e.g., seeding and planting small vegetation or other ground cover)
- For proposed trails that follow natural drainage flows, compact trail surfaces to limit stormwater erosion
- Additional acreage to offset permanent habitat loss

Safety and Accessibility

The following techniques and considerations may help to enhance trail accessibility and to prevent or minimize safety conflicts between pedestrians, bicyclists, and vehicles at trailheads or along the trails.

- Incorporate safety facets, as needed (e.g., clear sightlines and slowdowns at roadways)
- Brochure articles in newsletter or local newspapers
- Impose speed limits
- Bicycle bell giveaways
- Trail etiquette programs, volunteer trail patrol, public awareness campaigns
- Ranger or law enforcement patrols
- Clear sightlines
- Placement of fencing or natural vegetation buffers from sensitive natural areas
- Safety signs, signals, and markings to regulate, warn, or guide trail users and vehicle traffic
- Installation of gates or boulder barriers to preclude public access to maintenance roads

- Placement of signage, kiosks, or interpretative waysides
 - Orientation maps
 - Trail type and distance
 - Rules and regulations relative to allowable uses and activities (i.e., controlling dogs)
 - Habitat/resource conservation, recycling, and integration of trails with natural settings

Maintenance

The following maintenance practices and operational activities would be routine.

- Placement of receptacles, including trash collection and disposal
- Pet waste dispensers
- Update/repair of informational signs
- Trimming of vegetation or removal of invasive species
- Minor regrading of the trail surface (non-asphalt)
- Potholing filling
- Graffiti or dumping removal
- Inspection patrols
- Upkeep of the Santa Ana River pedestrian-crossing bridge
- Removal of fire ring or other arranged structures

Maintenance Activity	Description	Maintenance Frequency		Cost	Annual Frequency	Yearly Cost
		Description Table	Cost Table			
Empty trash cans along trails	Trashcans will be located throughout the trails system and will need to be emptied so that trash stays off of the trails.	Weekly	Every Week	\$ 195	52	\$ 10,140
Refill pet waste baggies	Pet waste dispensers will be located throughout the trails system and will need to be refilled when they become empty.	Every 3 months	Every 3 months	\$ 260	4	\$ 1,040
Maintenance of informational signs	Informational signs will be located at each of the staging zones. These signs will need to be maintained and repaired so that the public will always have access to them.	1 time every 3 months	1 Sign/Year	\$ 1,300	1	\$ 1,300
Updating information in informational kiosks	Information will be located at the informational kiosks at the staging areas. This information will need to be kept up to date so all hikers are aware of current conditions on the trail network.	Weekly	Every Month	\$ 130	12	\$ 1,560
Installations of signs	Signs will need to be installed to warn hikers of hazards and let them know where not to enter. Signs will also be used to guide hikers through the trail network.	As needed	Every 2 years	\$ 260	0.5	\$ 130
Repair/Maintenance of signs	Repair and maintenance on signs should take place as needed. Signs should be visible and easy to see at all times.	As needed	NA	NA	NA	NA
Removal of invasive species	Invasive species removal will take place periodically to make sure no trails are blocked or obscured.	Annually	Every 2 months	\$ 1,040	6	\$ 6,240
Recovery from acts such as vandalism or dumping	There is a possibility that vandalism and dumping of trash may take place on the trail networks. Maintenance will include repairing and or replacing anything that is damaged in such acts.	As needed	Every 2 weeks	\$ 650	26	\$ 16,900
Grade non-asphalt trail	Trails should be maintained so that hikers and bikers can travel easily. This includes grading, resurfacing, and filling potholes on trails.	As needed	Every 2 years	\$ 13,000	0.5	\$ 6,500
Patrol	Trails will need someone to be responsible for providing public safety, park information and protecting properties within the Wash Plan Area.	Every few days	Every week	\$ 780	5.2	\$ 40,560
						\$ 84,370

Appendix E

Preserve Management Activities

Activity	Resource Impact	Impact Avoidance Measures	Start-up and Installation Costs	Annual Costs	Estimated Cost
Pedestrian	Trash, litter, debris, and food waste dropped on trails degrades habitat and threatens species survival.	<p>Signage: Signs posted at trail access points and strategic locations throughout Preserve instructing visitors to dispose of all trash in trash receptacles. All signage types include: Habitat Protection (WSPA) Identification, Orientation, Directional Sign, Regulations, Safety & Hazards, and Interpretive (See trail map and signage locations.)</p> <p>Trash receptacles: Trash receptacles (five) with signage will be installed at trail entrances and major trail junctions throughout Preserve. {Receptacles that are wildlife proof to avoid ravens/coyotes. Keep on periphery. Packing in/packing out as a start to see how it goes. Concerned about overflowing trash receptacle impacting wildlife.}</p> <p>Education: Website, social media, docents, and rangers educate visitors about the Preserve, species and habitat protection, and illegal activities, including littering and off-trail use.</p> <p>Fines: Littering or damage to protected habitat areas for Woolly Star, San Bernardino Kangaroo Rat, and other protected species results in fines.</p> <p>Patrol Enforcement: Weekends plus one weekday</p> <p>Safety Measures: Post and cable safety barriers to separate trail use from hazards.</p> <p>Stewardship: Volunteers assist in monthly trash clean-ups in conjunction with Patrol Enforcement monitoring, as appropriate.</p>	<p>Signage: \$36,400 (assumes 13 signs @ \$2,800/sign including materials/labor)</p> <p>Trash receptacles (5): \$3,200</p> <p>Education: \$4,000 (website, social media package)</p> <p>Safety Measures: \$8,000 (post and cable)</p>	<p>Annual costs: \$47,400</p> <p>Patrol enforcement is \$45K per year assuming 1 ranger is present 3 days per week for 52 weeks.</p> <p>Stewardship Coordinator: 120 hrs/year @ \$20/hr = \$2,400 to allow for additional coordination; Redlands police organization tapped to help w/ this role.}</p> <p>Fines: Policy for fines requires adoption of an ordinance or enforcement of existing Redlands or Highlands ordinance.²⁸</p>	<p>Pedestrian Start-up and Installation Costs: \$51,600</p> <p>Pedestrian Annual Costs: \$47,400</p>

²⁸ Regulations need to be enforceable by law. Need an arrangement for ranger or sheriff deputy; writing tickets enforceable by state law—work w/ BLM possibly. USFWS would need to see an ordinance before passing it. Approach with friendlier educational enforcement, but have ticketing ability for those few individuals who need sterner education. Peace officer discretion.

Activity	Resource Impact	Impact Avoidance Measures	Start-up and Installation Costs	Annual Costs	Estimated Cost
Dog Walking	Trash, pet waste, dogs off leash species or habitat disturbance. ²⁹	<p>Includes all avoidance measures for pedestrian use plus pet waste bags.</p> <p>Signage/social media: Enforcement language and educational messaging (icons and text) will be included in signage and social media to enforce leash laws, promote proper use of trails, and prohibit off-trail use. Leashed dogs permitted on designated trails only. (See trail map signage locations.)</p> <p>Fines: Dog waste on trails and off-leash dogs results in fines. Trespassing in protected habitat areas for Woolly Star, San Bernardino Kangaroo Rat, and other protected species results in fines.</p> <p>Pet waste bags and signage: Located at trail access points and strategic locations throughout the Preserve. (See trail map for five pet waste bags locations.)</p> <p>Patrol enforcement: Four days per week.</p>	<p>Start-up/Installation costs: \$2,600</p> <p>Pet waste bags at three locations: \$2,600</p> <p>Signage/social media costs are covered in pedestrian use.</p>	<p>Pet waste bag replacement: \$100 per year</p> <p>Patrol enforcement: Additional \$7K/yr. Require slightly more hours (e.g., two more days per month compared to pedestrian use). Patrolling all trails, not just dog trails. {Specific leash ordinance may be needed.}</p>	<p>Dog Walking Start-up and Installation costs: \$2,600</p> <p>Dog Walking Annual Costs: Additional \$7K more per year than pedestrian use</p> <p>Pedestrian + Dog Walking Annual Costs: \$54,500</p>
Equestrian	Trash, horse waste, invasive weeds	<p>Includes all avoidance measures for pedestrian use plus horse waste clean-up.</p> <p>Signage/social media: Enforcement language and educational messaging (icons and text) will be included in signage and social media to promote proper use of trails and prohibit off-trail use. Horses permitted on designated equestrian trails only. (See trail map signage locations.)</p> <p>Fines: Trespassing in protected habitat areas for Woolly Star, San Bernardino Kangaroo Rat, and other protected species would result in fine.</p> <p>Horse waste clean-up: Located at equestrian access points and strategic locations throughout the Preserve. (See trail map.)</p>	<p>Set-up and Installation costs: Signage costs are included in pedestrian use costs.</p>	<p>Patrol enforcement would be the same as dog walking use.</p> <p>Invasive weed control maintenance costs are assumed to increase by \$500 monthly or \$6K/year.</p> <p>Monthly clean up and disposal of horse waste: \$720/year (assume 4 hours/month @ \$15/hr). (Horse use will be minimal due to limited equestrian access. Increased frequency will require additional funding.)</p>	<p>Equestrian Set-up and Installation costs: Covered in pedestrian use.</p> <p>Equestrian Annual Costs: \$6,720/yr more than dog walking</p> <p>Pedestrian + Dog Walking + Equestrian Annual Costs: \$61,220</p>

²⁹ Limit dog walking to perimeter trails/heavily used maintenance roads loop trail Cone Camp Trail; District employees present during working hours on these trails with responsibility to inform users of regulations because maintenance staff are stewarding the Preserve resources.

Activity	Resource Impact	Impact Avoidance Measures	Start-up and Installation Costs	Annual Costs	Estimated Cost
Biking	Trash, off-trail biking, species or habitat disturbance ³⁰	<p>Includes all avoidance measures for pedestrian use plus signage, fines, and trail blocks prohibiting off-trail use.</p> <p>Signage/social media: Enforcement language and educational messaging (icons and text) will be included in signage and social media to promote proper use of trails and prohibit off-trail use. Bikes permitted on designated bike trails only. (See trail map signage locations.)</p> <p>Fines: Off-trail biking violations are subject to fines.</p> <p>Off-trail blockades: Boulder barriers, gates, and/or vegetative buffers (e.g., prickly pear cactus, sage, and other natural barriers) will be installed to prohibit off-trail use. (See trail map boulder and vegetative buffer locations.)</p>	<p>Signage and social media: costs are included in pedestrian use costs.</p> <p>Off-trail blockades: Assume 8 gates @ \$5K each plus 6 boulder or vegetation barriers @ \$2K each for a total of \$52K.</p>	<p>Patrol enforcement: would increase to 5 days/week or \$75K/yr. patrol enforcement would increase to 5 days/week or \$75K annually (\$1440/week).</p> <p>Reserve: \$20K is maintained annually; set aside to address off-trail biking impacts to the Preserve (e.g., repairing blockades, vegetative buffers, and habitat).³¹</p>	<p>Set-up and Installation costs: \$52K</p> <p>Biking Annual Costs: Additional \$30K more than pedestrian patrol</p> <p>Total Annual Costs of Pedestrian, Dog Walking, Equestrian and Biking: \$91,220</p> <p>Reserve: \$20K maintained annually</p>
				<p>Subtotal Start-up Cost</p> <p>Subtotal Annual Cost</p> <p>Reserve Cost³²</p> <p>Total Cost</p>	<p>\$106,200</p> <p>\$ 91,220</p> <p>\$ 20,000</p> <p>\$217,420</p>

³⁰ Silent about skinny tire trails, bike lanes/road improvements, SAR Trail; most bikers on SART are doing 50 mile rides; keep off road vehicles out of preserve; potentially mountain bikers trying to get access—extra emphasis on interpretation and enforcement rules and regulations.

³¹ If preserve is impacted by an inappropriate activity, the use may be prohibited. "Area has been remediated" – sign warning the public that the use may be shut down.

³² Reserve of \$20K set aside to address repairs and other unexpected remediation costs.

Appendix F

Common Acronyms

- AASHTO- American Association of State Highway and Transportation Offices
- ABA- Architectural Barriers Act
- ACEC- Areas of Critical Environmental Concern
- ADA- American Disabilities Act
- BLM- Bureau of Land Management
- CADFW- California Department of Fish and Wildlife
- CESA-California Endangered Species Act
- CEQA- California Environmental Quality Act
- ESA- Endangered Species Act
- FWS- Fish and Wildlife Service (Federal)
- NEPA- National Environmental Policy Act
- MOU- Memorandum of Understanding
- O&M- Operations and Maintenance
- RNA- Research Natural Area
- SART- Santa Ana River Trail
- SBFC- San Bernardino County Flood Control
- SBVMWD- San Bernardino Valley Municipal Water District
- SBVWCD- San Bernardino Valley Water Conservation District
- WSPA- Woolly Star Preserve Area