

San Bernardino Valley Water Conservation District Combined SBKR Habitat & Water Recharge Enhancement – Wash Plan Implementation Proposal



1. Background

The concept for joint habitat and water conservation uses on the same geographic areas originated in the Upper Santa Ana River Wash Land Management and Conservation Plan (Wash Plan) adopted by the Board of Directors of the SBVWCD in 2009. The land uses anticipated within areas designated as “Habitat and Water Conservation” were intended to be implemented in a manner that provided mutual benefits to enhance both resource values. The Wash Plan specified discrete areas where improvements would be made in a conjunctive manner considering the attributes and values of each resource. The proposal described below extends that conjunctive land use principle to Plunge Creek which lies just west of, and contiguous with, the area designated as Habitat and Water Conservation in the Wash Plan. The opportunity for combined habitat and water recharge enhancement exists on at least 50 acres of District lands along the east-west reach of Plunge Creek in Section 11 (easterly of the confluence of Elder Creek with Plunge Creek and westerly of Section 12 and D Dike, as shown on Figure 1). Joint habitat and water recharge enhancement can work in concert with a mitigation program that was proposed in the draft HCP prepared in 2011. That mitigation program proposed to improve and/or restore the historic breakout channels from past episodic flood events in the Santa Ana River (SAR) to serve as movement corridors for SBKR (see Attachment A for movement corridor description). The breakout channels provide an opportunity for establishing movement corridors for SBKR that would provide connectivity for the Plunge Creek and SAR populations. The additional habitat and water recharge enhancement described herein provides a linkage to the movement corridor program, which is specifically focused on improving SBKR movement to improve population dynamics by linking the Plunge Creek and SAR populations. The habitat and water recharge enhancement would add a groundwater improvement benefit within the history channel of Plunge Creek, thereby creating a tangible economic benefit combined with an endangered species benefit.

2. Proposed Project

The SBVWCD proposes to include in the HCP a combined SBKR Habitat & Water Recharge Enhancement activity that will provide habitat improvements above the mitigation requirements for impacts to SBKR resulting from implementation of the Wash Plan while also providing groundwater recharge from native stream flow in Plunge Creek and from managed flows from water transmission canals that transmit water to the existing D Dike recharge facility. The habitat and recharge enhancement would be located along the stream course where it makes an abrupt stream course change from southerly to westerly, approximately 200 yards west of the northerly terminus of D Dike as shown in Figure 2. The enhancement activity would consist of vegetation removal/thinning along with stream course widening to the south. The stream enhancement is anticipated to extend approximately one-half mile to the west. Vegetation removal would focus on clearing all non-native grass down to soil substrate. Additional thinning of native shrubs, along with selective shrub removal, would be done in a manner to simulate pioneer phase Riversidian alluvial fan sage scrub (RAFSS) habitat. Small islands of RAFSS with

no ground cover vegetation and wide spacing of shrubs would increase foraging and movement habitat for SBKR. Widening of the stream course, in conjunction with very low density vegetative cover, would allow for increased water percolation in the stream bottom. This enhancement activity would complement the proposed mitigation to improve and/or restore the historic breakout channels from past episodic flood events in the Santa Ana River (SAR) to serve as movement corridors for SBKR. The breakout channels provide an opportunity for establishing movement corridors for SBKR that would provide connectivity for the Plunge Creek and SAR populations. The rationale for the proposal is described below.

The proposed enhancement project builds on the previously completed Wash Plan and Environmental Impact Report (EIR) as well as the proposed Habitat Conservation Plan (HCP) that is currently under preparation. The HCP is required by the Federal Endangered Species Act due to potential indirect harm that may occur to SBKR caused by implementation of the Wash Plan. The HCP identifies mitigation to offset the indirect effects of the Wash Plan. Part of that mitigation includes removing non-native grasses, restoring decadent vegetation to enhance SBKR habitat and other actions. The proposed enhancement project will add a recharge component to the Wash Plan vegetation management mitigation by spreading native waters flows in Plunge Creek through increased surface area of suitable substrate for percolation. No additional mitigation will be required for the enhancement project since the additional groundwater benefit will be derived from minor design adjustments in mitigation actions that are part of the larger Wash Plan. Figure 3 shows the existing mapped habitat for the project areas.

3. Biological Foundation

The San Bernardino kangaroo rat, a subspecies of the Merriam's kangaroo rat (*Dipodomys merriami*), typically is found in Riversidian alluvial fan sage scrub and sandy loam soils, alluvial fans and flood plains, and along washes with nearby sage scrub (McKernan 1997 as cited in USFWS 1998). Braden and McKernan (2000) suggest that the San Bernardino kangaroo rat also occurs in other habitats in their range, including chaparral and even disturbed areas that are associated with alluvial processes. Riversidian alluvial fan sage scrub vegetation within the Santa Ana River floodplain is comprised of three primary seral stages of alluvial fan sage scrub: pioneer, intermediate, and mature phases. Pioneer phase alluvial fan sage scrub is the initial colonizing stage where recent scouring and flood events have occurred. This phase is characterized by very sparse distributions of subshrubs dominated by bristly goldenaster (*Heterotheca sessiflora* spp. *echioides*) and scalebroom. The vegetation of the pioneer phase is relatively open (less than 50 percent canopy cover) and, along with the intermediate phase, supports the highest densities of the San Bernardino kangaroo rat (McKernan 1997 cited from FR 73 61935). The pioneer phase, with significant amounts of bare ground, can also facilitate movement for a bipedal species like the San Bernardino kangaroo rat. For Merriam's kangaroo rats, an abundance of perennial grass cover can create an unfavorable environment by interfering with ease of travel and escape from predators (Reynolds 1958 cited from FR 73 61935). Intermediate phase alluvial fan sage scrub is comprised mainly of subshrubs such as California buckwheat, brittlebush (*Encelia* sp.), yerba santa, our Lord's candle (*Yucca whipplei*), deerweed (*Lotus scoparius*), valley cholla (*Opuntia parryi*), and coastal prickly-pear (*Opuntia littoralis*). Intermediate phase alluvial fan sage scrub typically occurs on the first terraces above scoured channels. Intermediate phase alluvial fan sage scrub is considered high quality habitat for the San Bernardino kangaroo rat because this phase retains open, sandy areas favored by the

species. Intermediate phase alluvial fan sage scrub is expected to support the highest densities of the San Bernardino kangaroo rat of the three primary seral stages. Mature phase alluvial fan sage scrub typically occurs on higher terraces away from the active flood channel that have not been subjected to flooding and scouring for many years. The mature phase is characterized by large woody species such as chamise (*Adenostoma fasciculatum*), California juniper (*Juniperus californica*), our Lord's candle, holly-leaved cherry (*Prunus ilicifolia*), sugarbush (*Rhus ovata*), spiny redberry (*Rhamnus crocea*), and hoaryleaf ceanothus (*Ceanothus crassifolius*). The understory of may also have a large component of grass species. Because the mature phase is characterized by relatively dense vegetation with few sandy openings, it is considered less suitable for the San Bernardino kangaroo rat than the intermediate phase. Although mature areas are generally used less frequently or occupied at lower densities by San Bernardino kangaroo rats (likely due to heavy vegetative cover that inhibit burrowing and locomotion) than those supporting earlier phases, these areas are essential for the conservation of the subspecies (FR 73 61935).

Lower portions of the floodplain, where higher densities of San Bernardino kangaroo rats are found, are likely to become inundated or lost due to scour and sediment deposition during flooding events. During these floods, more upland refugia habitat may become very important for surviving inundation, and be a source for recolonization of the lower floodplain after flooding has subsided (Pavelka 2006 cited from FR 73 61935). San Bernardino kangaroo rat is also well documented in habitat that could be considered atypical but with suitable soils. These include areas that have been altered due to human disturbance, including airport margins; nonnative grasslands; margins of orchards and out-of-use orchards and vineyards; and areas of wildland/urban interface within floodplains or terraces and adjacent to occupied habitat (67 FR 19812, April 23, 2002). That San Bernardino kangaroo rat occupied this habitat shows that areas heavily disturbed can and do develop into suitable habitat for the subspecies through natural processes (67 FR 19812). These upland areas can support individuals for repopulation of wash areas extirpated by flood events through dispersal of adult individuals, or indirectly through dispersal of offspring (Pavelka 2006). The San Bernardino kangaroo rat typically occupies sandy loam substrates that allow for the digging of simple, shallow burrows (McKernan 1997 as cited by USFWS 1998). *D. merriami*, and other kangaroo rat species, actively avoid rocky substrates (Brown and Harney 1993). The large majority of the Plan Area supports Soboba stony loam sand, with a substantial component of psammments (sands) and fluvents within the historic active channels (NRCS Soil Survey Geographic [SSURGO] Database 2004). There are smaller pockets of Cienega sandy loam and Hanford coarse sandy loam. All these soils are suitable for the San Bernardino kangaroo rat either as burrowing habitats or as foraging and movement habitat.

3.1.Baseline Biological Conditions and Monitoring Requirements

As part of the biological work conducted for the HCP, a US Fish and Wildlife Service biologist and a consulting biologist working for the District established over nearly 200 plots in 2012 throughout the 4600 acre Wash Plan area to assess more finite habitat parameters of SBKR habitats. Figure 4 indicates the habitat mapped during this collaborative work with USFWS. The more discrete habitat elements were used to perform improved mapping of the various habitat suitability classes. The proposed project area contains several acres of high-valued habitat and areas with high potential habitat quality. The high potential areas will be focus of treatments to vegetation and substrates to improve SBKR habitat

and groundwater recharge capabilities. All will be mapped and documented prior to the project, so that the improvements and changes can be assessed.

Overall Wash Plan management and monitoring measures for SBKR will focus on maintaining and enhancing SBKR habitat, monitoring SBKR occurrence in key locations, maintaining SBKR movement corridors, and other related measures. The combined habitat and recharge enhancement project will act as a subset to the Wash Plan monitoring effort. The specific project monitoring measures will include before and after treatment presence-absence and abundance measurements assessed through animal trapping. Vegetation management will be monitored by conducting before and after treatment evaluations using toe-point and linear transects methods to determine plant species composition and density.

4. Groundwater Management Rationale

Increased surface permeability can be created within the broader, historic stream course of Plunge Creek by removing vegetation and organic surface soils thereby exposing underlying sandy substrate.

Increased groundwater percolation can be achieved by:

- Increasing the permeable area of the stream bottom in Plunge Creek
- Slowing the water which flows through the area with small diversions or sugar dams
- Maintaining the low flow areas for recharge
- Potentially supplying water flows when available from supply canals that currently transmit water to D Dike.

San Bernardino Valley Municipal Water District recently assessed all watershed streams to expand recharge. The results of this effort were documented in a January 2012 report. Plunge Creek was one of the creeks they documented potential for added recharge. The report indicates that the annual average flow is 6,122 acre feet per year based on historic flows from 1934-2008 (Report Figure 12). SBVMWD proposed recharge facilities downstream from the District Owned area indicated in Figure 1, in Sections 9 and 10. Recharge estimated for these basins assuming stormwater capture like the historic period from 1934-2008, was 3,729 acre feet per year (Report Figure 92). This was based on the flows that occur, the high hydraulic conductivity of the site at 6.7 feet per day as measured in 2011 (Report Figure 66) and the size of recharge ponds proposed. The area of the recharge basins proposed on District land are likely to be smaller than the 160 acres (Report Figure 83) and not all flows such as all of Elder Creek would be captured without flood control changes. However, it is estimated that as much as 41-50 acres could be developed in this area resulting in approximately 1000-1250 acre feet per year average recharge shown in Figure 2. The value of this water ranges from \$70-\$600 per acre foot resulting in an annual value to the groundwater of at least \$70,000.

Additionally, the stream management would provide additional meanders in the stream course under moderate to higher flows increasing recharge and habitat opportunities as well.

To enhance recharge and habitat, removal of concentrations of non-native grasses, along with the associated dense mat of dead grass that has built up over time, combined with removal of underlying loamy soil horizons will expose the underlying sandy substrate that is similar to the existing adjacent

stream bottom. It is anticipated that 6 to 18 inches of surface material would be removed by mechanical scraping to uncover the sandy substrate. It is anticipated that several areas or patches would be removed leaving a mosaic pattern of small shrub covered islands of vegetation. The exact size and number will require additional study but could range in total up to 10 – 20 acres. The vegetation islands would be thinned and shrubs pruned or removed to create a condition that would mimic the pioneer phase of RAFSS. The islands of vegetation would provide foraging and cover habitat for SBKR moving in and around the enlarged open sandy stream bottom. The newly exposed sandy surface would allow for SBKR movement and provide increased permeable surface area for groundwater percolation.

5. Hydrologic Conditions and Monitoring

Hydrologic conditions prior to the project will be assessed to create a baseline. In addition hydrologic conditions from stream flows and estimated recharge capacity will be modeled. Substrates will be characterized and delineated with GPS and documented for area and volumetric calculations. Increases in recharge area will be measured and used in determining recharge enhancement in the post-project conditions.

6. Potential Flood Control Benefits

The proposed project provides some benefits to Flood Control management activities in the Plunge Creek and Elder Creek confluence area. The project widens the existing channel which helps alleviate the existing concentration of flood flows that occurs in the lower end of this reach of Plunge Creek. County Flood Control is currently engaged in a project that is contiguous on the western edge of the project boundaries. The Flood Control project is designed to remediate existing problems with the confluence of the Elder Creek Flood Control Channel and Plunge Creek. The proposed project will be designed in coordination with County Flood Control to assist in mitigating the outflow problems that currently exist at outlet of the Elder Creek Channel.

7. Climate Change and Greenhouse Gases

The project mimics natural processes and poses no potential for significant emittance of greenhouse gases (GHG) or significant effects on global climate change. On the contrary, the project is part of a larger Wash Plan Land Management and Habitat Conservation program that retain approximately 1950 acres in natural, undisturbed or restored habitat (approximately 42% of the total Wash Plan area). The conservation of native vegetation contributes to oxygen production through plant photosynthesis and through sequestration of CO₂ by plant growth. The project also provides a small, but positive benefit to water supply availability through its enhancement of recharge capability to the Bunker Hill Groundwater Basin. These positive effects of the project are consistent with San Bernardino County's and the State California's objectives in reducing the adverse effects of GHGs, which are more fully described below.

To fully understand global climate change, it is important to recognize the naturally occurring —greenhouse effect— and to define the greenhouse gases (GHGs) that contribute to this phenomenon. Various gases in the Earth's atmosphere, classified as atmospheric GHGs, play a critical role in

determining the Earth's surface temperature. Solar radiation enters Earth's atmosphere from space and a portion of the radiation is absorbed by the Earth's surface. The Earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. GHGs, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), nitrogen trifluoride (NF₃), and sulfur hexafluoride (SF₆). For most non-industrial development projects, motor vehicles make up the bulk of GHG emissions produced on an operational basis. The primary greenhouse gases emitted by motor vehicles include carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons (CARB, 2004). Following are descriptions of the primary greenhouse gases attributed to global climate change, including a description of their physical properties, primary sources, and contribution to the greenhouse effect.

As identified above, there are several technical studies regarding the environmental effects of climate change on the Earth as well as California. Several adverse environmental effects have been identified that are projected to impact California over the next century. However, the extent of these environmental effects are still being defined as climate modeling tools become more refined. Potential environmental effects of climate change that could significantly impact the State of California could include the following:

Adverse impacts on water supply availability;

- Increased severity of flooding events;
- Increased wildland fire hazards;
- Alteration of natural habitats and impacts to biological resources;
- Adverse impacts on agricultural resources; and
- Adverse impact to public health.

Using only the greenhouse gas reduction due to the reduction in electricity from the offset of the import of water needed from the State Water Project, estimated at 1.1 metric ton per acrefoot the project would reduce an estimated 1,375 Metric Tons of CO₂ per year.

While not the primary purpose of the project it would have a minor impact, but could help reduce flooding severity, improve natural habitats for biological resources and increased fire adaptation. The project will have minor amounts of vehicle exhaust emissions will result from project implementation cause by use of heavy equipment and light trucks and automobiles used for excavation work and project labor commutes as well as project manager oversight, respectively. The during of excavation is expected to be approximately two weeks using heavy duty front-end loaders and dump trucks.

8. CEQA Documentation and Status

The proposed project was included as an implementing action addressed in the EIR prepared for the Wash Plan, certified in November 2008. However, the project will likely require a California Department of Fish and Game Stream Alteration Agreement. Additionally, the project will also likely require a federal Section 10(a)(1)(B) permit for incidental take of SBKR that may occur during excavation work to remove non-native grasses and surface organic soils. The 10 a permit clearance will be provided in conjunction with the approval of the Wash Plan HCP and provided for the project. Should the project enter permitting in advance of the Wash Plan HCP the permit will be developed in coordination with the planning for the Wash Plan.

9. Summary

The District has been working with the USFWS on a renewed conservation strategy for the Wash Plan or Plan B. The success of this conservation strategy is an opportunity to begin working with our partners to develop sustainable Wash Plan projects that provide multiple benefits for water, habitat and resources management. In coordination with San Bernardino County Flood and SBVMWD, the City of Highland and the Bureau of Land Management the District could facilitate development of the project and seek grant or other funding to accomplish the development of these facilities.

10. Budget

The development of a project budget is based on preliminary planning and limited design work. The project can be adjusted in acreage to accommodate the budget. Initial costing is based on the work done by SBVMWD in their water recharge studies of the tributaries.

Plunge Creek Area Habitat and Water Conservation Project Cost Estimate

Description	Basis	Total
Planning		
Preliminary Soils Investigation	LS	\$6,200
Site Approval/Development Plan	LS	\$8,800
Environmental Initial Study	LS	<u>\$14,000</u>
		\$29,000
Design		
Boundary Survey	LS	\$5,600
Topography/Aerial Survey	LS	\$6,200
Hydrology and Hydraulic Study	LS	\$14,000
On-site Improvement Plans	LS	\$36,000
QA/QC	LS	<u>\$2,400</u>
		\$64,200
Studies, Plans, Permits		
SWPPP Report	LS	\$3,000
Construction Staking	LS	\$12,000
Biological Baseline Survey	LS	\$7,500
Environmental Review	LS	\$8,800

Development Plan Review	LS	\$7,500
Grading Plan	LS	\$4,800
Improvement Plans	LS	\$2,100
Fish & Game	LS	\$7,500
Meetings & Travel	LS	\$2,500
Grading Permit	LS	\$1,200
Improvements Permits	LS	\$2,500
Flood Control Permits	LS	<u>\$8,000</u>
		\$67,400
Project Management		
Project Manager	14 mos 17 hours per month \$190/hr	\$45,150
Sr. Field Staff	12 mos 30 hr/mo @ \$76/hr	\$27,360
Habitat Monitoring following 12 mons	LS	<u>\$7,500</u>
		\$80,010
Construction**		
Mobilization	LS	\$8,200
Pioneering and Jobsite Prep	LS	\$4,000
Pre-Wet and Processing Utilities	LS	\$4,200
Clearing & Grubbing	43 AC@ 1,800.00/AC	\$77,400
Rough Grading/Excavation	255410 CY 2.50/CY*	\$638,525
Finish Grading/Access Control	63852 CY 3.20/CY*	\$204,326
Erosion Control	LS	<u>\$15,000</u>
		\$951,651
Cost Summary and Contingency		
	Planning	\$29,000
	Design	\$64,200
	Studies, Plans, Permits	\$67,400
	Project Management	\$80,010
	Construction**	\$951,651
	Total Before Contingency	\$1,192,261
	Contingency	\$178,839
	Total Estimated Costs	\$1,371,101

* Cost depending on depth and design

**Based on Bonadiman Costs estimated as of September 27, 2011

\$16,904

Preliminary annual maximum operating costs are shown below:

Annual Maximum Operations Cost

Monthly Monitoring	2 hours/wk Sr Field Staff	\$7,904
Sediment removal/grading	2 x per year 4500 each	<u>\$9,000</u>
		\$16,904

11. Schedule

The development of a planning level schedule for major tasks is shown below. This schedule is likely to be adjusted to the any changes in budget or scope.

Plunge Creek Area Habitat and Water Conservation Project Schedule

Description	Duration	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Planning															
Preliminary Soils Investigation	1 mon														
Site Approval/Development Pl	1 mon														
Environmental Initial Study	1 mon														
Design															
Boundary Survey	1 mon														
Topography/Aerial Survey	1 mon														
Hydrology and Hydraulic Study	2 mon														
On-site Improvement Plans	2 mon														
QA/QC	1 mon														
Studies, Plans, Permits															
SWPPP Report	1 mon														
Construction Staking	1 mon														
Biological Baseline Survey	1 mon														
Environmental Review	1 mon														
Development Plan Review	2 mon														
Grading Plan	1 mon														
Improvement Plans	1 mon														
Fish & Game	1 mon														
Grading Permit	1 mon														
Improvements Permits	2 mon														
Flood Control Permits	2 mon														
Project Management															
Procurement	2 mon														
Project Manager	project														
Sr. Field Staff															
Habitat Monitoring	1 mon														
Construction															
Mobilization	1 mon														
Pioneering and Jobsite Prep	2 mon														
Pre-Wet Processing	1 mon														
Clearing & Grubbing	2 mon														
Rough Grading/Excavation	3 mon														
Finish Grading/Access Control	2 mon														

Additionally, permitting times are approximate.



Legend

- Potential Habitat and Water Conservation Areas (41 Acres)
- Existing Water Channel
- Potential Water Channel

State Plane
NAD 83, Zone V, feet
Data Sources:
SBVWCD, ICF Jones & Stokes

0 0.125 0.25 0.5 0.75 1 Miles

Figure 1: Vicinity

Source: SBVWCD GIS
Craig Brudin
Sept 14th, 2012





State Plane
NAD 83, Zone V, feet
Data Sources:
SBVWCD, ICF Jones & Stokes

0 330 660 1,320
Feet

Figure 2: Potential Habitat and Water Conservation Area

Source: SBVWCD GIS
Craig Brudin
Sept 14th, 2012



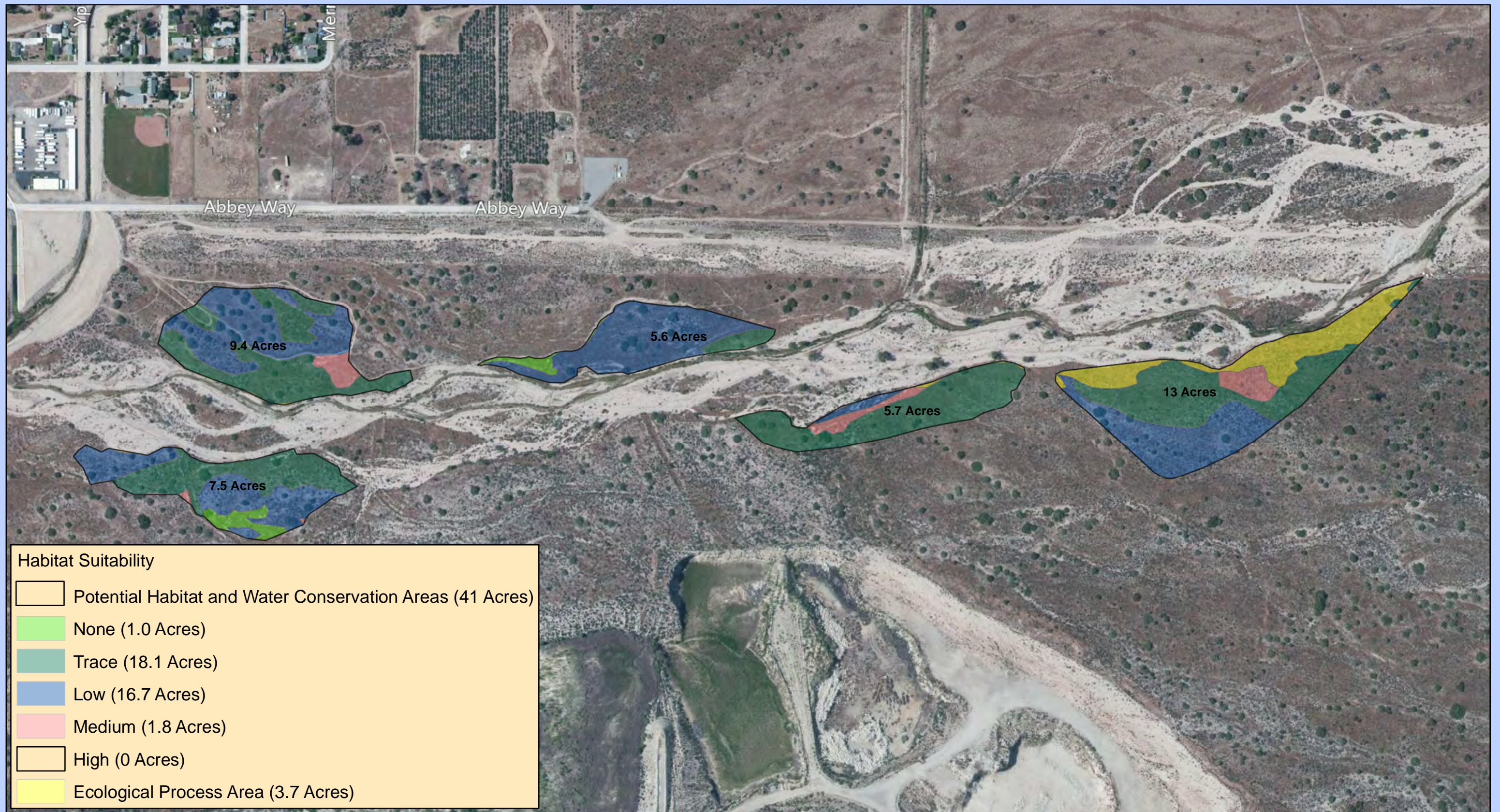
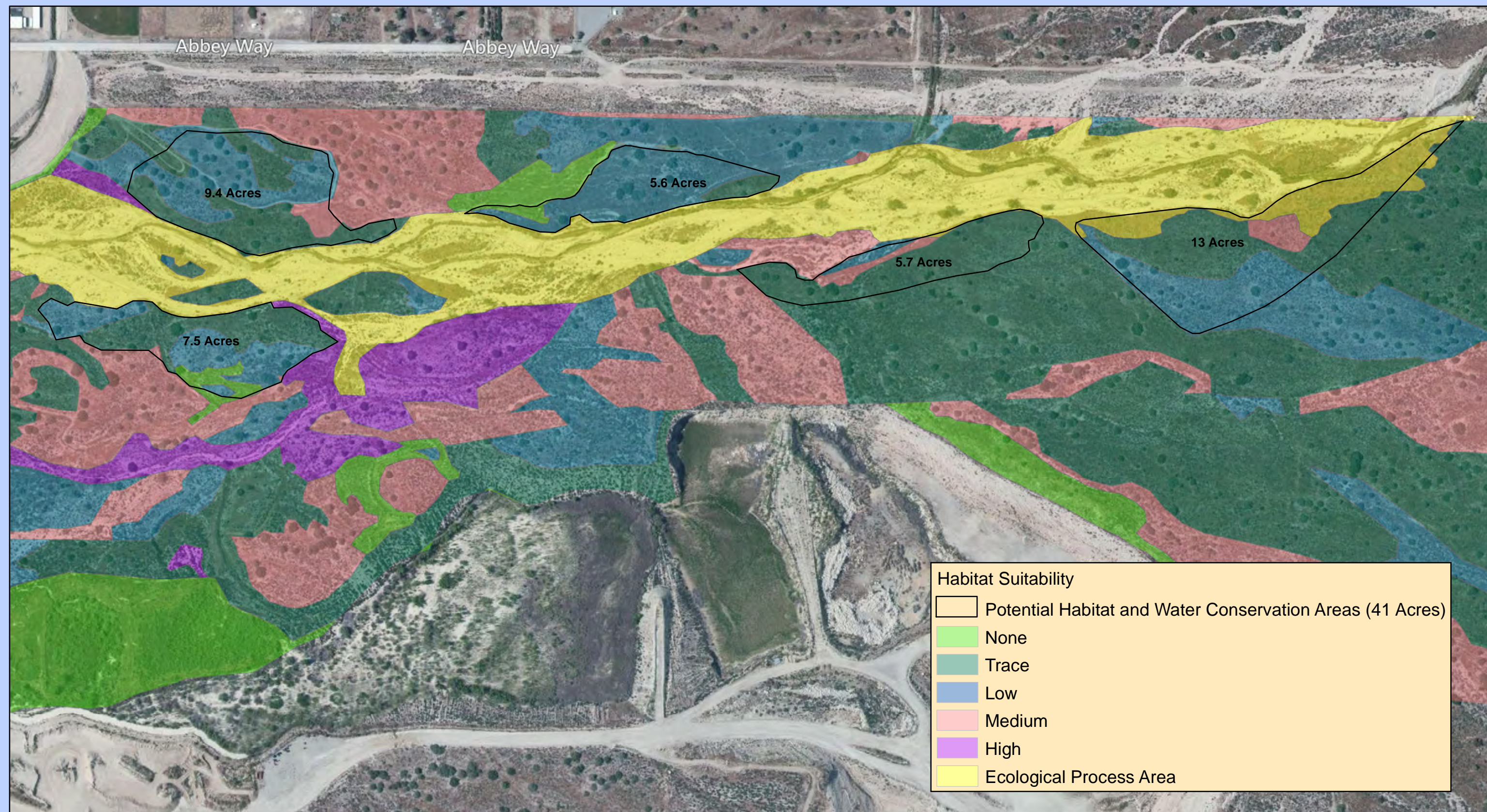


Figure 3: Treatment Areas

Source: SBVWCD GIS
Craig Brudin
September 14th, 2012





State Plane
NAD 83, Zone V, feet
Data Sources:
SBVWCD, ICF Jones & Stokes

0 330 660 1,320 Feet

Figure 4: All Habitat Classes

Source: SBVWCD GIS
Craig Brudin
September 10th, 2012



Plunge Creek Water Recharge and Habitat Improvement

Project ID: **2078**

9/28/2012
4:19:01 PM

Lead Agency:

Agency: San Bernardino Valley Water Conservation District

Project Director: Daniel Cozad

Address: 1630 W. Redlands Blvd.

Redlands 92373

Email: dcozad@sbvwcd.org

Phone: 909-793-2503

Cell Phone: 909-747-5240

General Project Information:

Name: Plunge Creek Water Recharge and Habitat Improvement

Description: SBVWCD proposes to include in the HCP a combined SBKR Habitat & Water Recharge Enhancement activity that will provide habitat improvements above the mitigation requirements for impacts to SBKR resulting from implementation of the Wash Plan while also providing groundwater recharge from native stream flow in Plunge Creek and from managed flows from water transmission canals that transmit water to the existing D Dike recharge facility. The habitat and recharge enhancement would be located along the stream course where it makes an abrupt stream course change from southerly to westerly, approximately 200 yards west of the northerly terminus of D Dike. The enhancement activity would consist of vegetation removal/thinning along with stream course widening to the south. The stream enhancement is anticipated to extend approximately one-half mile to the west. Vegetation removal would focus on clearing all non-native grass down to soil substrate to create habitat in excess of mitigation requirements..

Goals/Objectives:

Increased groundwater percolation can be achieved by:

- Increasing the permeable area of the stream bottom in Plunge Creek
- Slowing the water which flows through the area with small diversions or sugar dams
- Maintaining the low flow areas for recharge
- Potentially supplying water flows when available from supply canals that currently transmit water to D Dike.

Habitat Goals are to increase the available high value habitat in the Plunge Creek to:

- Develop and expand San Bernardino Kangaroo Rat habitat in the area of the Wash Plan on lands that will be conserved
- Create more natural stream course during high flows and improve the sediment management for habitat after the high flows.

Working with SB County Flood Control to provide reduction in sediment reduction in nuisance flows and some mitigation in flooding through improvement of the stream course widening of the channel achieve reduction in pressure on flood control facilities below.

To be continued....

Need:

The primary purpose of the project is to enhance habitat and recharge, with other multipurpose benefits. The project is needed. The concept for joint habitat and water conservation uses on the same geographic areas originated in the Upper Santa Ana River Wash Land Management and Conservation Plan (Wash Plan) adopted by the Board of Directors of the SBVWCD in 2009. The land uses anticipated within areas designated as "Habitat and Water Conservation" were intended to be implemented in a manner that provided mutual benefits to enhance both resource values. The Wash Plan specified discrete areas where improvements would be made in a conjunctive manner considering the attributes and values of each resource. The proposal described below extends that conjunctive land use principle to Plunge Creek which lies just west of, and contiguous with, the area designated as Habitat and Water Conservation in the Wash Plan. The opportunity for combined habitat and water recharge enhancement exists on District lands along the east-west reach of Plunge Creek in Section 11 (easterly of the confluence of Elder Creek).

IRWM Goals:

Plunge Creek Water Recharge and Habitat Improvement

Project ID:2078

9/28/2012
4:19:01 PM

- Preserve and enhance the environment
 - Protect and enhance the ecological function of open-space
 - Protect and enhance water-related habits
 - Reduce or eliminate invasive riparian and aquatic species
- Improve regional integration and coordination
 - Engage stakeholders in planning and implementation of watershed projects
 - Search for projects that meet multiple goals across geographic and water resource services
- Manage rainfall as a resource
 - Provide appropriate flood control capacity and other benefits to the community
 - Maximize beneficial use of rain water
- Promote sustainable water solutions
 - Preserve open-space and recreational opportunities
 - Increase opportunities for recreation and open-space
 - Provide useable open-space for all residents of the watershed
- Maintain quality of life
 - Balance quality of life, and social, environmental and economic impacts when implementing projects
 - Consider the needs of disadvantaged communities

IRWM Type

Round 2 Funding

OWOW Plan

Project Type: Construction

Subregional Plan: Yes

Plan Name: This Project is an enhancement component of a regional multibenefit program referred to the San Ana Wash Plan or Plan B and the Upper Santa Ana IRWM when updated.

Requesting assistance for implementing sustainable water rates: No

Meeting SBx7-7 20% by 2020 efficiency goal : No

Latitude: 34.10426 Longitude: -117.16508

Project Location: Combined SBKR Habitat & Water Recharge Enhancement – Wash Plan Implementation

Project Benefits:

Benefits	Applicable
Water supply reliability, conservation and use efficiency	Yes
Stormwater capture, storage, cleanup, treatment and management	Yes

Plunge Creek Water Recharge and Habitat Improvement

Project ID:2078

9/28/2012
4:19:01 PM

Removal of invasive species; wetlands creation or enhancement; acquisition, protection and restoration of open space	Yes
Non-point source pollution reduction, management, monitoring	No
Groundwater recharge and management	Yes
Contaminant and salt removal, reclamation, desalting and conveyance to users	No
Water banking, exchange, reclamation and improvement of water quality	Yes
Planning and implementation of multipurpose flood management programs	No
Watershed protection and management	Yes
Drinking water treatment and distribution	No
Ecosystem and fisheries restoration and protection	Yes

Where Benefits Accrue:

Jurisdiction: Multiple Communities

Explanation: Benefits accrue throughout the based for water recharge. Additionally habitat benefits accrue across the range of the SBKR.

Subwatershed /Basin: Multiple Subwatersheds

Explanation: Primary benefit to the San Bernardino Basin Area with secondary benefits to the foothill basins throughout the watershed due to habitat improvements.

Synergies: This project is part of the Upper Santa Ana Wash Plan and is coordinated in implementation with the recharge and habiat efforts of the regional plan.

Benefits to Disadvantaged Communities (DAC) and Native Tribal Communities (NATC)

Plunge Creek Water Recharge and Habitat Improvement

Project ID: 2078

9/28/2012
4:19:01 PM

100% DAC: No Portion DAC: Yes DAC %: 60

100% NATC: No Portion NATC: No NATC %: 0

Describe DAC and NATC

Benefits:

While the DWR Census block area shows this as not being a DAC area, the Assessment of the one mile area around the project indicates and median Household Income of \$36,110K. While much of the benefit of the project are to the community as well as the local neighborhood, the reduction in flooding is a direct benefit. Additionally they have nearby openspace.

Environmental Justice:

This area near the wash has traditionally been disadvantaged due to nearby land uses, mining, gun range, and poor flood control and services.

Project Partners:

Agency Name	Contact	Phone	Email	Collab Planning	Direct Funding	In-Kind Service	Co-Manager
San Bernardino County Flood Control and Water Conservtion District	Kevin Blakeslee	909-387-7918	kblakeslee@dpw.sbcounty.gov	Yes	No	Yes	No
San Bernardino Valley Municipal Water District	Doug Headrick	909-387-9226	dcdouglass@sbvmwd.com	Yes	No	Yes	No
US Fish and Wildlife Service	Ken Cory	760-322-2070	Ken_Corey@fws.gov	Yes	No	Yes	No
Inland Empire Resource Conservation District	Mandy Parks	909-799-7407	mparkes@iercd.org	Yes	No	Yes	No
Santa Ana Wash Plan Task Force	Daniel Cozad	909-793-8498	dcozad@sbvwc.org	Yes	No	Yes	Yes
Santa Ana Wash Plan Task Force	Daniel Cozad	909-793-8498	dcozad@sbvwc.org	Yes	No	Yes	Yes

Project Funding:

Category	Amount	Percent
Total Project Cost	\$1,371,101.00	100
Requested Round 2 Funding	\$1,019,051.00	74
Match Contribution	\$352,050.00	26
Local Contribution	\$272,050.00	20
Federal Contribution	\$0.00	0

Plunge Creek Water Recharge and Habitat Improvement

Project ID:2078

9/28/2012
4:19:02 PM

In-Kind Contribution	\$80,000.00	6
Other	\$0.00	0
SRF Loan	\$0.00	999

Annual O&M Costs: \$16,904.00

Funding Secured: Yes

Explain: Funding for local contribution would come from District Land funds and may include contributions from groundwater recharge rates and other project partners and funding is available for 2013 and 2014

O&M Funding Secured: Yes

Explain: Maintenance of Recharge portions of the project would be maintained in cooperation with the Flood Control district and funded as ongoing district operations.

Project Criteria:

Criteria	Metric	Description
Stormwater Capture and Storage	1250 AFY	NA
Preservation and Restoration	50 Acres	NA
Natural hydrology restoration and connectivity	NA	Improves natural channel of Plunge Creek to create habitat and reduce flooding
LID	NA	Utilizes lands in channel that could not otherwise be used for multiple functions and improves the habitat.
Greenhouse Gas	1375 metric tons CO2e/yr	Estimated at 1.1 ton per Acre Foot not imported from State Water Project. Additional reduction may be provided by the preservation of native habitat and offset by the energy requirement of construction and maintenance. No credit taken for these reductions.
Climate Change Adaptation	NA	By restoring parts of the creek with wider channel and sediment capture lessens the impacts of higher flows and flooding downstream. Increase local capture in lower flow storm events.
Impacts to Natural Hydrology	Positive	Assists in reducing the high flows of sediment and channels some sediment into the creation of habitat. Reducing the need for additional flood control and impacts.

Project Status:

Plunge Creek Water Recharge and Habitat Improvement

Project ID:2078

9/28/2012
4:19:02 PM

Project Status: Planning studies completed

Est. Complete Date: 03/30/2014 Est. Operational Life (years): 50

Agency Constructed Similar Projects : Yes

CEQA Status: Complete Date: 11/30/2008

NEPA Status: Not Applicable Date: NA

Project Attachments:

Type	FileName
Partners	2078_agreement.pdf
Funding	2078_sbvwcd 2012 proposed budget 5.7.12.pdf
Status	2078_Plunge Creek Habitat-Water Con Schedule.pdf
Status	2078_Combined SBKR Habitat Water Recharge V-4 + fig 1-4s.pdf

Project Complete: Yes

Project Active: Yes