

Table 4-2. Potential Impacts of Individual Covered Activities to Vegetation Communities

Covered Activity Code	Impacts to Vegetation										Total
	Riversidean Alluvial Fan Sage Scrub - Pioneer	Riversidean Alluvial Fan Sage Scrub - Intermediate	Riversidean Alluvial Fan Sage Scrub - Intermediate/Mature	Riversidean Alluvial Fan Sage Scrub - Mature	Riversidean Alluvial Fan Sage Scrub - Mature/NNG	Riversidean Upland Sage Scrub	Chamise Chaparral	Non-Native Grassland (NNG)	Recharge Basin	Developed/Ruderal	
CD.01		2.6	6.6	1.3			0.1	0.9	39.7	13.8	65.1
CD.02		0.3	3.0	5.3	0.6		4.2	0.3	3.6	23.8	41.1
CD.03		1.4	10.6	2.9				0.4	0.1	4.4	19.9
CD.04			0.5	0.4	0.4			0.1		0.3	1.6
Ceme.01										1.2	1.2
EVWD.01										6.2	6.2
EVWD.02				0.4	4.5					5.1	1
EVWD.03				0.2	0.4					6.1	6.7
EVWD.04				0.4	0.2						0.5
EVWD.05			0.2	0.3							0.5
EVWD.06				0.5							0.5
EVWD.07			0.3	0.6			0.1			2.9	4.0
EVWD.08										0.1	0.1
EVWD.09										4.0	4.0
FC.01	2.2	0.3			0.1			0.8		4.2	7.7
FC.03	5.1	1	1.9	2.1		0.1		1.0		9.8	29.9
FC.04		2.1		0.4						0.1	2.6
FC.09	8.8	8.7			3.2			14.6		22.3	57.6
High.01	0.1	2.2								2.7	5.0
High.02		0.1								11.4	11.6
High.03		0.7		0.6	1.0					19.4	21.6

Covered Activity Code	Impacts to Vegetation										Total
	Riversidean Alluvial Fan Sage Scrub - Pioneer	Riversidean Alluvial Fan Sage Scrub - Intermediate	Riversidean Alluvial Fan Sage Scrub - Intermediate/Mature	Riversidean Alluvial Fan Sage Scrub - Mature	Riversidean Alluvial Fan Sage Scrub - Mature/NNG	Riversidean Upland Sage Scrub	Chamise Chaparral	Non-Native Grassland (NNG)	Recharge Basin	Developed/Ruderal	
High.04	0.1	0.2	0.9					0.7		10.9	12.8
High.10		0.1	0.9							1.5	2.5
High.11	0.2							0.1			0.2
High.12								0.6		2.1	2.7
High.13										0.6	0.6
High.14								0.1		1.7	1.8
High.15			0.5				0.1	0.1		3.0	3.7
High.16		0.5		0.1						4.9	5.4
High.17		0.1								0.2	0.4
High.18										1.1	1.1
High.19				0.4						1.1	1.5
High.20	0.2	0.1									0.3
High.21										3.7	3.7
High.22					0.5					0.6	1.0
Mine.01	0.1	118.1	201.2	9.6		7.7		13.5		734.5	1,084.8
Redl.02	0.1		1.0					1.3		0.1	2.5
Redl.03				0.1				0.1		0.3	0.4
Redl.04		0.1	0.1					0.9		1.7	2.7
Redl.05	0.3	0.5		0.4							1.1
Redl.06		0.1	0.1							2.0	2.1
Redl.07										0.7	0.7
Redl.08										0.1	0.1
Redl.09	0.2	4.9		8.5				6.7		22.1	42.4
Redl.10	0.2									0.2	0.4

Covered Activity Code	Impacts to Vegetation									Total
	Riversidean Alluvial Fan Sage Scrub - Pioneer	Riversidean Alluvial Fan Sage Scrub - Intermediate	Riversidean Alluvial Fan Sage Scrub - Intermediate/Mature	Riversidean Alluvial Fan Sage Scrub - Mature	Riversidean Alluvial Fan Sage Scrub - Mature/NNG	Riversidean Upland Sage Scrub	Chamise Chaparral	Non-Native Grassland (NNG)	Recharge Basin	Developed/Ruderal
Redl.11	0.1									0.2
Redl.12	0.2	0.4		0.5				1.2		5.8
Redl.13			1.6							0.1
VD.01.1			36.7	49.9	9.0		45.8	3.5	1.2	1.6
VD.01.2										0.5
VD.01.3			0.8	0.4	0.1		0.5			1.3
VD.02					0.6			0.5		7.7
VD.03				0.7	3.9					1.2
VD.04	0.1		0.3					0.8		7.8
VD.05	0.3	3.7	1.3	1.3	3.4		0.1			2.2
VD.06		0.1								
VD.07			0.1							
VD.09		1.1	1.1							2.2
VD.10										7.2

Table 4-3. Potential Impacts of Individual Covered Activities to Covered Species

Covered Activity ID	Impacts to Santa Ana River Woolly Star		Impacts to Slender-horned Spineflower			Impacts to CAGN Suitable Habitat			Impacts to Cactus Wren Habitat Suitable for Nesting			Impacts to SBKR Habitat Suitability					
	Occupied		Occupied	Potentially Suitable		Nesting	Foraging		Nesting	Foraging		High Potential	Medium Potential	Low Potential	Trace Ecological Process Area	Total SBKR Habitat	
All Covered Activities Total	46.5		1	419.7		10.4	649.3		GIS TBP			26.8	80.1	129.6	373.4	25.0	634.9
CD.01	2.6			9.2			50.4					0.8			1.5		2.4
CD.02	0.8		0.2	3.3			17.1					0.5	0.2	0.8	21.0		22.5
CD.03	1.5		0.2	12.0			15.0					3.5	0.6	2.1	9.1		15.3
CD.04				0.5			1.2								1.4		1.4
Ceme.01															1.1		1.1
EVWD.01															2.3		2.3
EVWD.02							4.9								5.7		5.7
EVWD.03							0.6								0.3		0.3
EVWD.04							0.5								0.5		0.5
EVWD.05				0.2			0.5								0.5		0.5
EVWD.06							0.5								0.5		0.5
EVWD.07	0.1			0.3			1.0								1.1		1.1
EVWD.08																	
EVWD.09															0.2		0.2

Covered Activity ID	Impacts to Santa Ana River Woolly Star		Impacts to Slender-horned Spineflower			Impacts to CAGN Suitable Habitat			Impacts to Cactus Wren Habitat Suitable for Nesting			Impacts to SBKR Habitat Suitability					
	Occupied		Occupied	Potentially Suitable		Nesting	Foraging		Nesting	Foraging		High Potential	Medium Potential	Low Potential	Trace Ecological Process Area	Total SBKR Habitat	
FC.01	0.1			0.3			2.7								0.4	2.9	0.4
FC.03	0.4			11.9		2.1	17.2						2.0	3.6	4.8	4.4	10.3
FC.04				2.1			2.4								2.0		2.0
FC.09	1.3			8.7			23.0					0.5	0.5	3.9	6.0	17.3	10.8
High.01				2.2			2.4								1.6	0.2	1.6
High.02	0.5			0.1			0.2							0.2		0.1	0.2
High.03				0.7			2.2								1.6		1.6
High.04	0.2		0.4	1.1			1.1							0.3	0.5	0.1	0.8
High.10				1.0			1.0							0.1	0.2		0.2
High.11							0.2									0.2	
High.12														0.1		0.1	0.1
High.13																	
High.14																	
High.15	0.2		0.1	0.5			0.6								1.4		1.4
High.16				0.5			0.6								0.2		0.2
High.17				0.1			0.1										
High.18				0.0			0.1								0.1		0.1
High.19							0.4								1.4		1.4
High.20				0.1			0.3									0.3	
High.21															0.7		0.7
High.22				0.0			0.5								0.6		0.6

Covered Activity ID	Impacts to Santa Ana River Woolly Star	Impacts to Slender-horned Spineflower		Impacts to CAGN Suitable Habitat		Impacts to Cactus Wren Habitat Suitable for Nesting		Impacts to SBKR Habitat Suitability				
	Occupied	Occupied	Potentially Suitable	Nesting	Foraging	Nesting	Foraging	High Potential	Medium Potential	Low Potential	Trace Ecological Process Area	Total SBKR Habitat
Mine.01	36.3	8.2	319.3	7.7	328.9			22.4	76.3	115.6	143.9	358.2
Redl.02			1.0		2.4				0.5		0.6	0.5
Redl.03					0.1						0.1	0.1
Redl.04			0.1		0.1						0.2	0.2
Redl.05			0.5		1.1						1.0	1.0
Redl.06	0.1		0.1		0.2						0.2	0.2
Redl.07			0.0		0.1						0.2	0.2
Redl.08												
Redl.09	0.1		4.9	1.0	19.1					2.7	7.0	9.7
Redl.10					0.2							
Redl.11					0.1							
Redl.12	0.1	0.9	0.5		1.1					0.7	0.1	0.8
Redl.13	1.1		1.6		1.6					0.6	1.0	1.6
VD.01.1	1.9		36.7		142.7						145.1	145.1
VD.01.2												
VD.01.3			0.8		1.7						3.0	3.0
VD.02	0.1	0.4			0.8						0.5	0.5
VD.03					4.6						4.8	4.8
VD.04	0.1	0.2	0.3		0.4						0.7	0.7
VD.05			5.0		10.2					0.1	9.5	9.6
VD.06			0.1		0.1					0.1	0.1	0.1

Covered Activity ID	Impacts to Santa Ana River Woolly Star	Impacts to Slender-horned Spineflower		Impacts to CAGN Suitable Habitat		Impacts to Cactus Wren Habitat Suitable for Nesting		Impacts to SBKR Habitat Suitability				
	Occupied	Occupied	Potentially Suitable	Nesting	Foraging	Nesting	Foraging	High Potential	Medium Potential	Low Potential	Trace Ecological Process Area	Total SBKR Habitat
VD.07			0.1		0.1						0.1	0.1
VD.09	0.8	0.1	2.3		2.3			0.6	0.3	0.7	0.7	2.3
VD.10	0.3											

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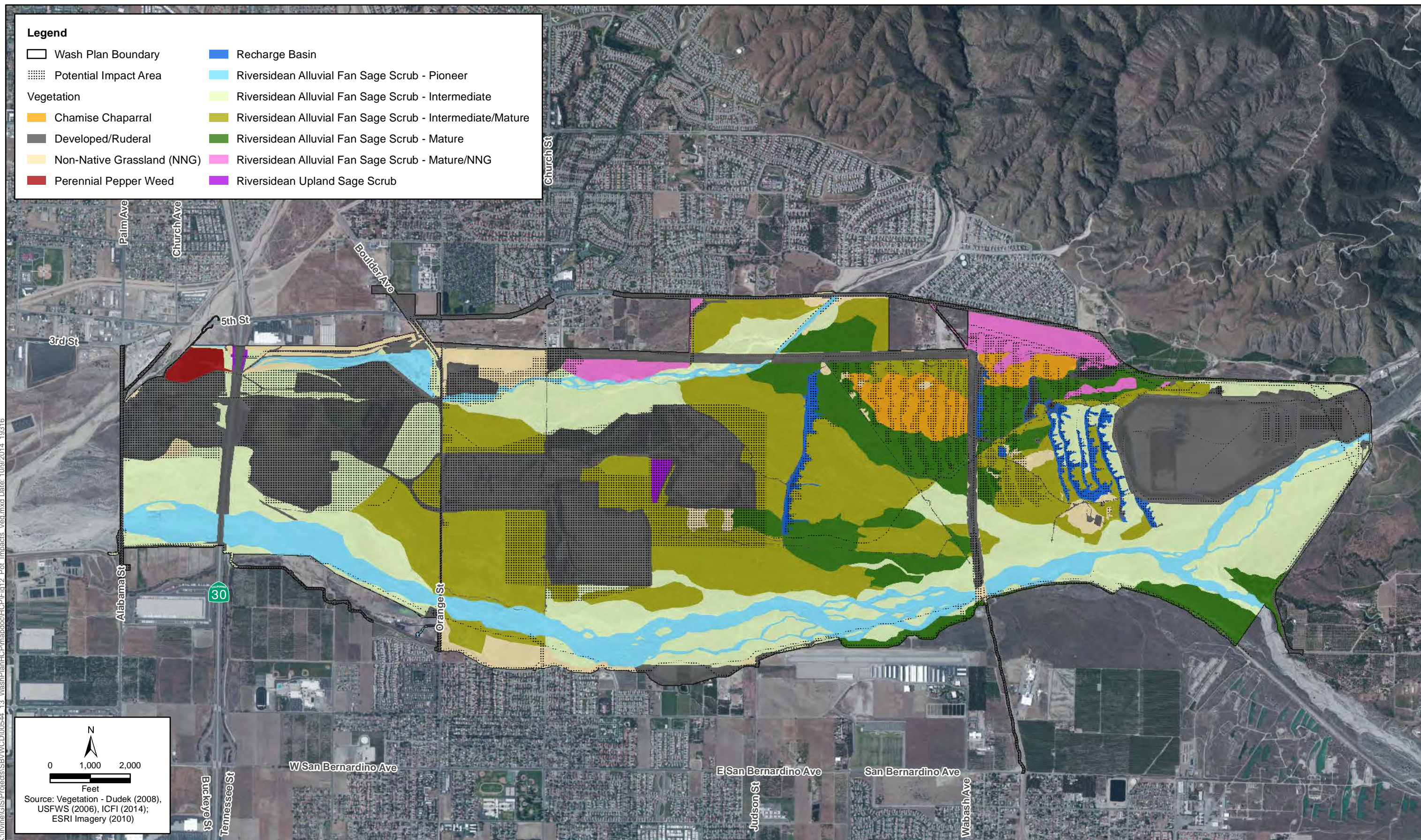


Figure 12
Potential Impacts to
Vegetation Communities
Wash Plan HCP



Figure 13
Potential Impacts to
Slender-horned Spineflower
Wash Plan HCP

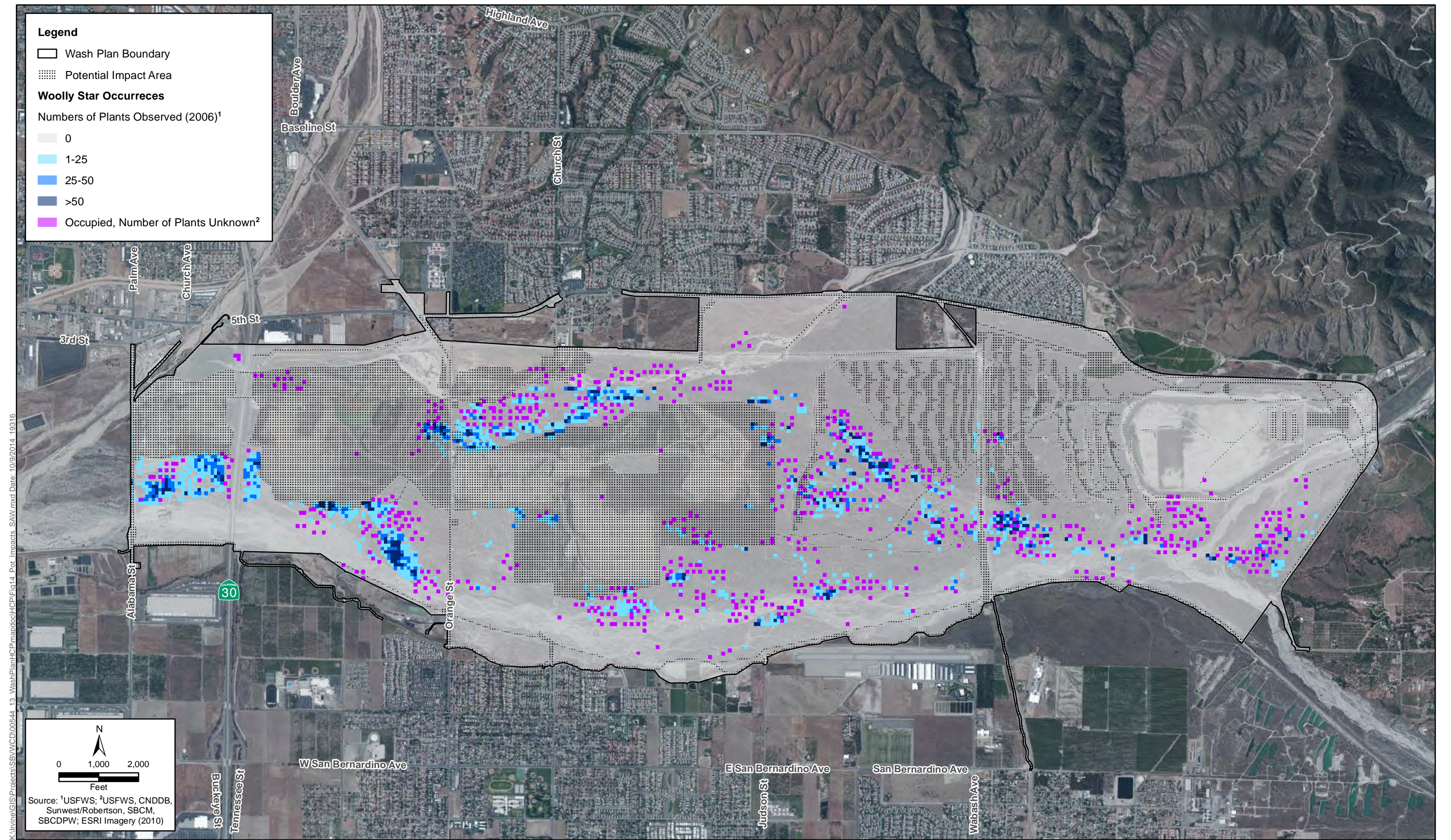


Figure 14
Potential Impacts to
Santa Ana Woolly Star
Wash Plan HCP

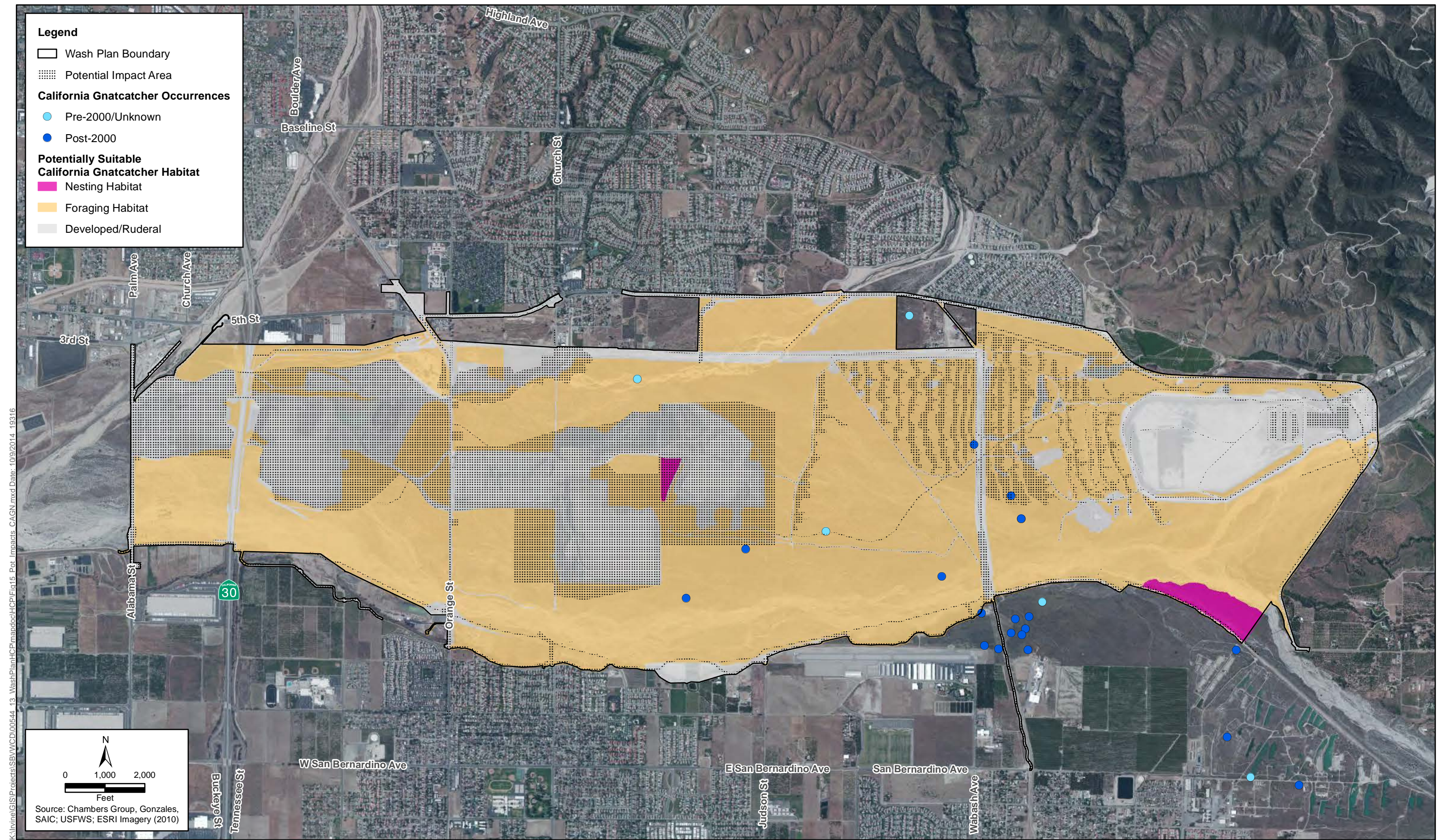
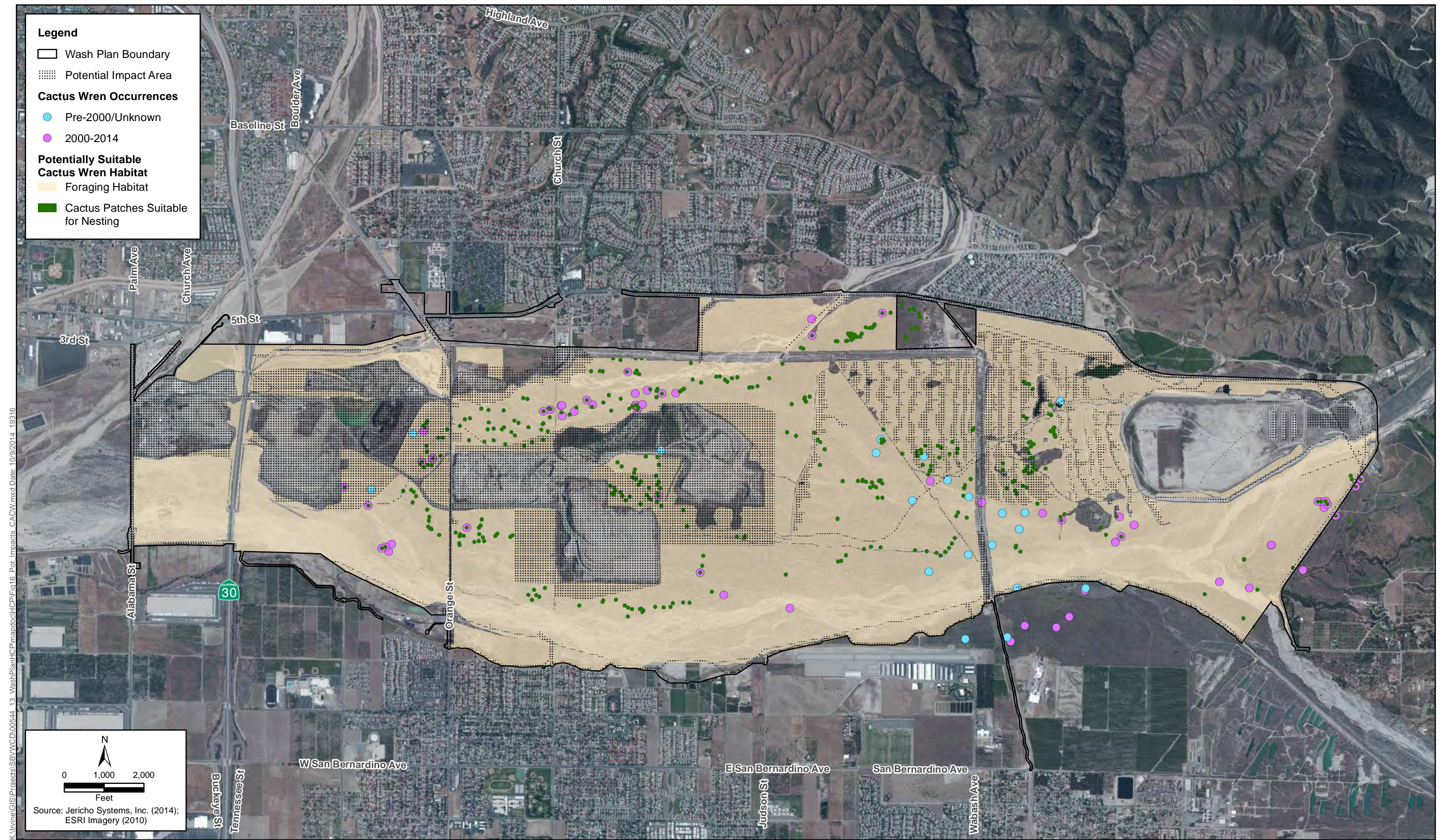


Figure 15
Potential Impacts to
California Gnatcatcher
Wash Plan HCP



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Figure 16
Potential Impacts to
Cactus Wren
Wash Plan HCP

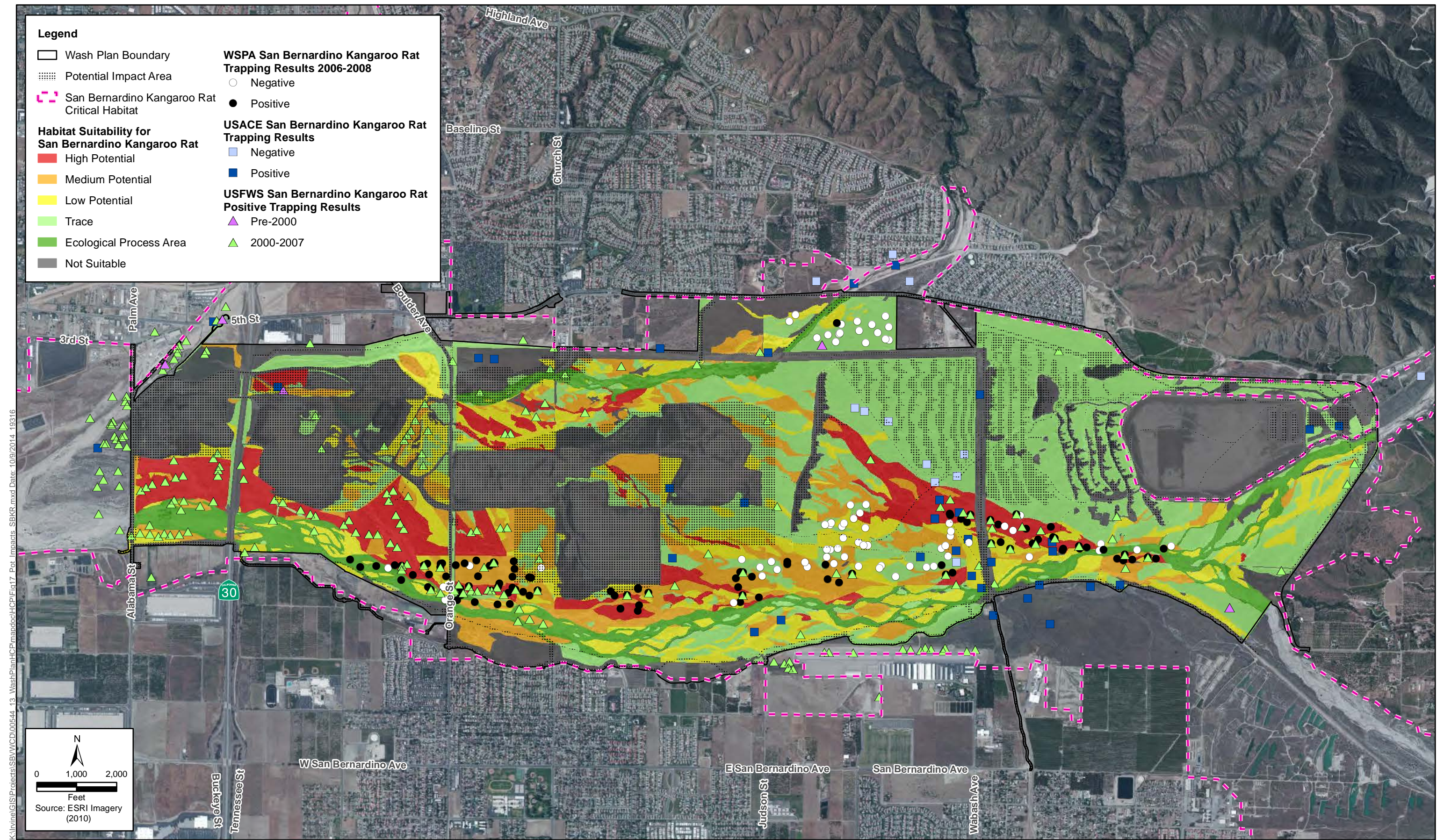


Figure 17
Potential Impacts to
San Bernardino Kangaroo Rat
Wash Plan HCP

The majority of impacted acres (304.3 acres) is associated with mining activities and contiguous with existing mining operations, which leaves the vegetation communities and covered species habitat largely intact with a high level of connectivity within and among habitat types.

4.3 Slender-horned Spineflower Impacts

The distribution of spineflower in the plan area is quantified in two ways. First, by quantifying the area of known previously and currently occupied habitat (___ ft buffer around known occupied locations); and second by quantifying the amount of potentially suitable habitat based on the distribution of vegetation communities that support slender-horned spineflower. Of the 47.7 acres of occupied habitat, 10.0 acres will be potentially impacts by covered activities (Table 4-3); however, none of the impacted habitat (see Figure 13) is currently occupied based on survey records (2000 – 2012). Of the ___ acres of potentially suitable habitat, ___ acres (___%) are potentially impacted by covered activities. While none of the recently occupied areas are impacted, one location will become isolated from the other locations where it will left on an “island” of habitat surrounded by existing and future mining operations. Avoidance and minimization measures will be implemented prior to undertaking each covered activity to reduce the overall quantity of take as much as is feasible (see Section 5.4 General Avoidance and Minimization Measures). Critical habitat has not been designated for Spineflower.

4.4 Santa Ana River Woollystar Impacts

The distribution of woollystar in the plan area is quantified by indicating the total area of occupied grid cells (___m x ___m) documented during the 2006 surveys. Of the 329.0 acres of occupied habitat, 46.5 acres (14%) will potentially be impacted by covered activities (Table 4-3). As shown in Figure 14, the largest concentrations of occupied habitat (including those areas with the highest density of plants) are generally unaffected by direct impacts of covered activities, or are impacted at the edges of population clusters. Therefore, the covered activities leave the populations largely intact with continued habitat connectivity between occupied areas. Avoidance and minimization measures will be implemented prior to undertaking each covered activity to reduce the overall quantity of take as much as is feasible (see Section 5.4 General Avoidance and Minimization Measures). Critical habitat for Woollystar has not been designated.

4.5 California Gnatcatcher Impacts

The distribution of gnatcatcher habitat in the Plan Area is quantified in terms of nesting habitat and foraging habitat based on the mapped vegetation communities. Approximately 10.4 acres of potential nesting habitat (22%) and 649.3 acres of potential foraging habitat (19%) may be impacted by covered activities (Table 4-3 and Figure 15). While the potential nesting habitat has the right habitat characteristics to support a nesting pair, there are no records of gnatcatchers nesting in the vicinity. Expansion of the mining areas will not appreciably increase the fragmentation of foraging habitat. While the removal of foraging habitat to construct new spreading basins will result in a loss of habitat, the remaining habitat in between spreading basins will still function as useable foraging

habitat with sufficient proximity and connectivity to larger blocks of habitat. There are no known nesting records in the Plan Area, however, gnatcatchers are known to nesting in suitable habitat south of the Santa Ana River below the eastern portion of the Plan Area. Two of the six known occurrences are within the covered activity footprints, however the core area of habitat use is generally south of most of the covered activities (on the WSPA, BLM land, and SBVWCD land). Avoidance and minimization measures will be implemented prior to undertaking each covered activity to reduce the overall quantity of take as much as is feasible (see Section 5.4 General Avoidance and Minimization Measures). There is no critical habitat for Gnatcatcher in or adjacent to the Plan Area.

4.6 Cactus Wren Impacts

The distribution of cactus wren habitat in the Plan Area is quantified in terms of nesting habitat based on the field mapping of cactus patches suitable for nesting (buffered by 50 ft); and foraging habitat based on the mapped vegetation communities. Approximately 14.1 acres of potential nesting habitat (23.5%) and 646.1 acres of potential foraging habitat (19.5%) may be impacted by covered activities (Table 4-3 and Figure 16). Expansion of the mining areas will impact three areas that have supported nesting cactus wrens and will remove some foraging habitat. However, the majority of suitable nesting habitat and known nest site occurs north of the mining areas and south of Plunge Creek, with several other concentrations of suitable nesting habitat south and east of the mining areas. Another concentration of suitable nesting habitat will be removed with the construction of new spreading basis. The removal of foraging habitat to construct these new spreading basins will also result in a loss of habitat, but the remaining habitat in between spreading basins will still function as useable foraging habitat with sufficient proximity and connectivity to larger blocks of foraging habitat and nearby nesting habitat. Avoidance and minimization measures will be implemented prior to undertaking each covered activity to reduce the overall quantity of take as much as is feasible (see Section 5.4 General Avoidance and Minimization Measures). There is no critical habitat designated for Cactus wren because it is not federally listed.

4.7 San Bernardino Kangaroo Rat Impacts

The distribution of SBKR in the plan area is quantified by field mapping and systematic habitat assessment surveys (as described in Section 4.3.1). Habitat suitability was mapped into high, medium, low, and trace suitability categories. The areas supporting ecological processes that maintain SBKR suitability (hydrogeomorphic scour and deposition) were also mapped and impacts to these areas are quantified. Table 4-3 and Figure 17 summarize and depict the potential impacts to SBKR habitat. Covered activities are expected to impact up to 26.8 acres of high potential suitability (6.5%), 80.1 acres of medium potential suitability (16.2%), 129.6 acres of low potential suitability (21.5%), and 373.4 acres of trace suitability habitat (26.9%). Approximately 25.0 acres of ecological process area (7.3%) also occurs within the covered activity footprints, however the majority of this area (17.3 acres) is within the Elder/Plunge Creek Restoration Reasonably Foreseeable Project (FC.09), a project that will maintain or enhance the ecological processes in this area.

As is evident in the balance of impact in each habitat suitability type, the covered activities (primarily mining) have been located outside of the habitat with the highest suitability. This pattern also correlates with the overlap of covered activity footprints with the occurrence data such that the majority (___%) of occurrence locations will not be directly impacted by covered activities.

Because any covered activities that are conducted at night and involve illumination of occupied habitat could disrupt essential breeding and foraging behaviors, there are no planned nighttime operations except for any essential emergency response activities.

Because of the widespread distribution of SBKR in the Plan Area and the location of covered activities, it is not expected that any occupied SBKR will be isolated following the implementation of covered activities. Activities that could place temporary or permanent impediments to SBKR movement could disrupt habitat connectivity and SBKR dispersal patterns, therefore any covered activities with the potential to interrupt a known habitat connection will be implemented according to the General Avoidance and Minimization Measures (see Section 5.4).

The extent and spread of nonnative grasses is one of the greatest threats to SBKR habitat suitability. Such habitat degradation could result from the effects of covered activity land disturbance and related activities that induces additional spread of non-native plant species. Therefore, monitoring and the implementation of avoidance and minimization measures will be implemented along with an adaptive management strategy addressing nonnative grass management.

The entire Plan Area is included within designated critical habitat. Therefore, all impacts to SBKR habitat are potentially an adverse modification to critical habitat, and will need to be addressed by USFWS through their internal Section 7 consultation process. The conservation strategy for SBKR and additional protection and management of SBKR habitat is expected to offset any potential adverse modification of SBKR critical habitat.

Chapter 5

Conservation Program

This chapter presents the conservation program that the covered parties will implement for SBKR, Gnatcatcher, Woollystar, and Spineflower in the Plan Area to avoid, minimize, monitor, and mitigate the effects of incidental take of these species and contribute to their survival and recovery.

5.1 Biological Goals and Objectives

Biological goals are the broad, guiding principles for the operating conservation program of the HCP, and are the rationale behind the minimization and mitigation strategies. Biological objectives are developed to describe the means by which the goals will be accomplished. Biological objectives should be specific and commensurate with the impacts and duration of the covered activities, and may be either habitat or species based (65 FR 106: 35242-35257). Habitat-based goals and objectives are expressed in terms of amount and/or quality of habitat. Species-based goals and objectives are expressed in terms specific to individuals or populations of that species.

Biological Goal of the Wash Plan HCP

The goal of the Wash Plan HCP is to conserve and enhance populations of covered species in the plan area through land conservation and an adaptive habitat management program, to minimize and mitigate the effects of take and to meet specific Federal Endangered Species Act requirements.

Biological Objectives

The biological objectives are:

- BioObj-1. To conserve habitats in the Wash Plan area in a configuration and amount that will sustain populations of Federally-listed species, specifically the San Bernardino kangaroo rat, the slender horned spine flower, the Santa Ana River woolly star, and the California gnatcatcher, as well as the cactus wren and other special status species;
- BioObj-2. To conserve habitat linkages across and to areas outside the Plan Area in order to provide connectivity between populations of covered species and provide opportunities for wildlife movement through the Plan Area;
- BioObj-3. To develop a robust, science based experimental program to address issues unique to the maintenance and enhancement of existing slender-horned spineflower populations and the potential establishment of new ones within the conserved areas of the Plan Area;
- BioObj-4. See slender-horned spineflower monitoring below. [To be updated and expanded based on the outcome of the spineflower meeting]; and

- BioObj-5. To actively manage conserved lands within the Plan Area for the benefit of covered species, including control of non-native plant species, selective vegetation thinning, and habitat enhancement.

5.2 Habitat Conservation and Management

SBVWCD and the other permittees will provide for the permanent conservation and management of approximately 1,176.7 acres (Newly Conserved Lands on Figure 18) and provide for the enhanced management and monitoring of an additional 541.4 acres (Additionally Managed Lands on Figure 18). The Newly Conserved and Additionally Managed Lands are generally contiguous with one another and with the 535.7 acres of existing conservation within the Plan Area. They also maintain north-south habitat linkages across the Plan Area and to natural open space outside the Plan Area to the southeast and northwest. Table 5-1 summarizes the conservation calculations for the vegetation communities, and Table 5-2 summarizes the same calculations for each covered species.

Table 5-1. Vegetation Communities Conserved and Managed in the Wash Plan HCP

Land Cover Type	Conservation Areas			Total	Neutral Lands	Mining & Other Covered Activities	Grand Total
	Existing Conservation	Newly Conserved	Additionally Managed				
Riversidean Alluvial Fan Sage Scrub - Pioneer	79.0	259.1	28.6	366.7	60.1	16.5	443.3
Riversidean Alluvial Fan Sage Scrub - Intermediate	178.6	400.8	206.2	785.6	124.2	155.9	1,065.7
Riversidean Alluvial Fan Sage Scrub - Intermediate/Mature	178.0	243.2	243.0	664.2	111.5	263.9	1,039.6
Riversidean Alluvial Fan Sage Scrub - Mature	93.4	130.9	55.8	280.1	60.7	85.0	425.8
Riversidean Alluvial Fan Sage Scrub - Mature/NNG		24.8	0.0	24.8	58.7	25.8	109.2
Riversidean Upland Sage Scrub					1.6	7.8	9.4
Chamise Chaparral		39.1		39.1	18.2	50.9	108.2
Non-Native Grassland (NNG)	1.1	20.3	1.1	22.6	92.1	45.0	159.7
Perennial Pepper Weed					20.0		20.0
Recharge Basin	0.0	4.6	4.4	9.0	15.7	44.3	68.9
Developed/Ruderal	5.6	53.7	2.4	61.7	384.6	920.3	1,366.6
				2,253		1,615	
Grand Total	535.7	1,176.7	541.4	.8	947.3	.3	4,816.4

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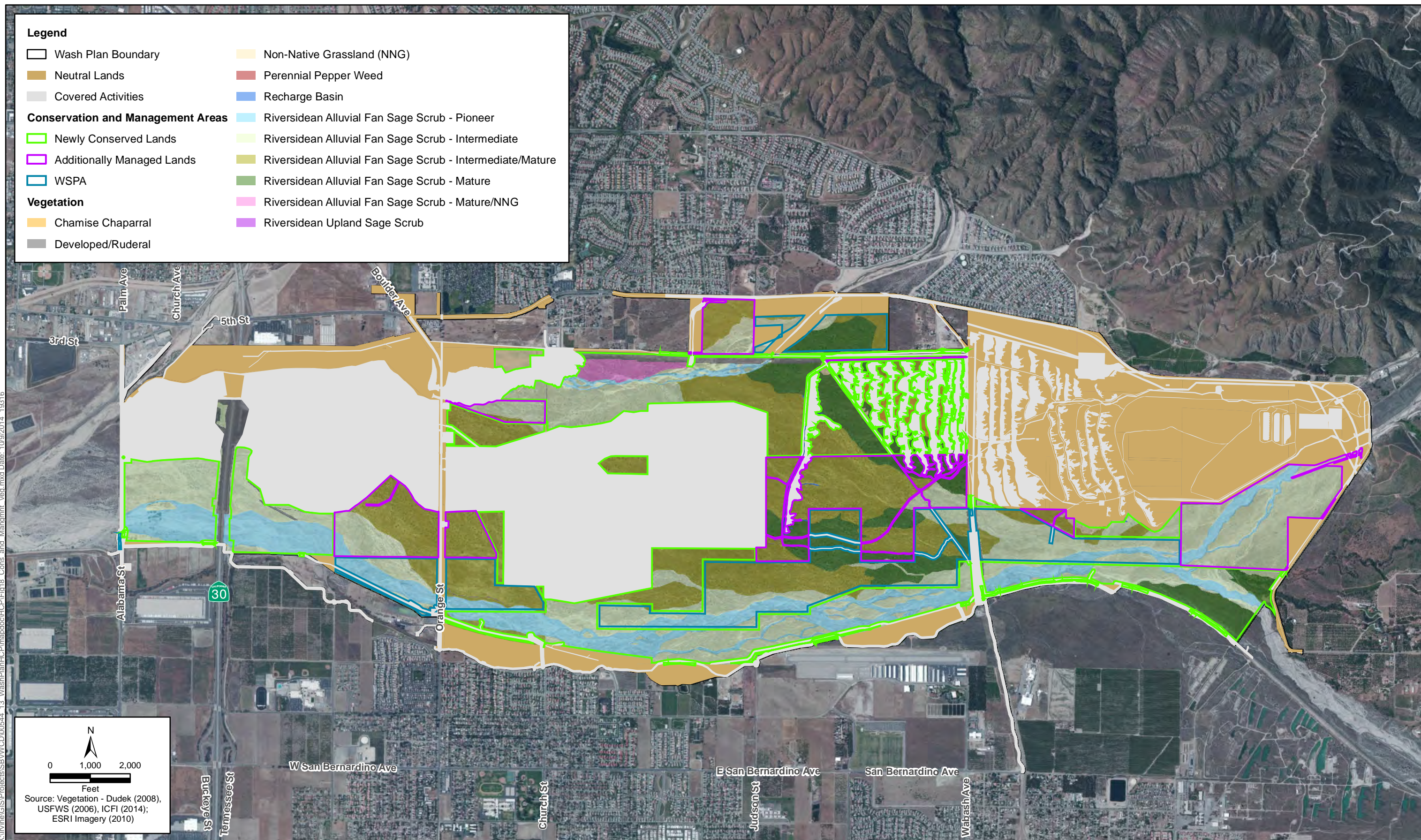


Table 5-2. Species Habitats Conserved and Managed in the Wash Plan HCP

Species Habitat Quantification	Conservation Areas			Total	Neutral Lands	Other Covered Activities/Mining	Grand Total
	Existing Conservation	Newly Conserved	Additionally Managed				
Slender-horned spineflower							
<i>Known Occupied Areas</i>	8.8	5.2	23.3	37.3	0.3	10.0	47.7
<i>Potentially Suitable Habitat</i>	356.6	644.0	449.2	1,449.8	235.7	419.7	2,105.3
Santa Ana River woollystar							
<i>Known Occupied Areas</i>	72.6	129.1	75.6	277.3	5.2	46.5	329.0
California Gnatcatcher							
<i>Nesting Habitat</i>		36.4		36.4		10.4	46.9
<i>Foraging Habitat</i>	527.3	1,063.8	538.0	2,129.1	550.6	649.3	3,329.1
Cactus Wren							
<i>Nesting Habitat</i>	9.2	19.7	12.5	41.3	4.4	14.1	59.8
<i>Foraging Habitat</i>	518.2	1,080.7	525.5	2,124.4	546.6	646.1	3,317.1
SBKR							
<i>High Potential Habitat</i>	90.1	157.4	134.1	381.6	0.0	26.8	408.4
<i>Medium Potential Habitat</i>	142.3	171.8	76.7	390.8	23.5	80.1	494.4
<i>Low Potential Habitat</i>	105.6	239.3	93.3	438.3	33.2	129.6	601.1
<i>Trace Habitat</i>	124.0	323.5	168.2	615.7	394.6	373.4	1,383.7
<i>Ecological Process Area</i>	62.5	198.4	30.7	291.7	25.1	25.0	341.8

Management Goals and Actions

Management Goal 1 General Actions

MngGoal-1. Form a reserve management committee to provide reserve management guidance and to focus efforts on meeting the HCP resource management goals and objectives.

The reserve management committee will:

MgG1 Action-1. Guide the preparation of and review and approve a detailed management plan within two years of the Incidental Take Permit being issued.

MgG1 Action-2. Review and accept the annual work plan and recommended budget to the Wash Plan Task Force or the SBVWCD Board of Directors

MgG1 Action-3. Review and accept the annual report of management and monitoring activities for consideration by the Wash Plan Task Force.

Management Goal 2 Habitat-based Actions

MngGoal-2. Maintain, restore and enhance habitat for the benefit of covered species

MG2 Habitat Action-1. Control invasive, exotic plants, prioritizing target species, treatment areas and the phasing of treatment based on the greatest benefit to federally listed species and their habitats.

Methods (May be used alone or in combination with other methods)

- Mechanical removal (Hand and/or Equipment)
- Herbicides
- Graze in selected areas
- Prescribed burn selected areas
- Other methods of demonstrated efficacy

MG2 Habitat Action-2. Re-vegetate selected areas to restore and enhance native vegetation

- Collect and store seeds and harvest cuttings
- Hand broadcast or hydroseed seeds and plant cuttings
- Irrigate as necessary to establish new plants

MG2 Habitat Action-3. Control invasive animals

- Remove non-native animals from the conservation areas which are competing with and/or preying on native species

MG2 Habitat Action-4. Control invasive pathogens

- As needed, control plant and animal pathogens affecting federally listed species, their food sources and their habitats.
- Conduct ongoing surveys for new infestations of exotic plants in the conservation areas with a dedicated survey of all areas at least annually.

MG2 Habitat Action-5. Maintain and restore fluvial processes

- Remove or modify levee's to restore flow to historic stream channels
- Remove sediment berms/piles that line and constrain watercourse channels
- Place soft plugs "sugar dikes" in strategic locations to restore fluvial processes in braided stream channels

Management Goal 2 Species-based Actions

Slender-horned spineflower

MgG2 Species Action-1. Control invasive exotic plants within and on the outer edges of extant populations (see control methods above)

MgG2 Species Action-2. Restoration and Enhancement

Convene the Spineflower Working Group (see below), as needed, to review and provide input on restoration and enhancement plans

- Collect and store seed from extant populations

- Plant seed adjacent to extant populations and in selected new areas
- Consider and possibly implement experiments to relocate populations and/ or the underlying substrate, including the seed bank, from impact areas.

MgG2 Species Action-3. Irrigate selected extant populations to increase seedling survival and ultimately the size of the available seed bank.

MgG2 Species Action-4. Manage seed bank through physical substrate management (raking, etc.).

MgG2 Species Action-5. Minimize sources of soil carbon through removal of organic material from habitat management activities.

MgG2 Species Action-6. Provide (as needed) and/or maintaining water flows to maintain and enhance spine-flower habitat.

Spineflower Working Group

Of the species addressed in the Wash Plan Habitat Conservation Plan, the slender-horned spineflower is the least understood, both biologically and in terms of management and recovery. To best plan and implement an adaptive management strategy for the spineflower, the Wash Plan Task Force requested that staff select and assemble a Working Group of academics, regulatory biologists, consultants and other experts. The Working Group was convened to ensure that the best available science was considered in developing management prescriptions best suited to maintaining existing populations on the Wash Plan project area and increasing the distribution of spineflower in treatment areas.

The group discussed the importance of managing invasive grass species, providing sheet flow to refresh habitat and the need to manage the seed bank or population of seeds present in the soil. These seeds likely persist for years and only germinate under very narrow window of environmental conditions. Therefore, successful recovery of the species depends on the viability of the seed bank, not just the yearly population of plants observed in a survey. Fortunately, the seed bank remains viable in the soil for a long period of time and will persist through periods of drought. The seed bank of invasive grasses is not as robust. Input from the group was added to the Habitat Management Plan (HMP) portion of the HCP document. Additionally, the group volunteered agreed to review specific management plans as they are developed.

San Bernardino kangaroo rat

MgG2 Species Action-7. Reduce to and/or maintain invasive annual grass cover in priority management areas to ≤ 20 percent (see control methods above).

MgG2 Species Action-8. Reduce to and/or maintain shrub cover in priority management areas to ≤ 40 percent (see control methods above).

MgG2 Species Action-9. Re-vegetation with native RAFS species.

MgG2 Species Action-10. Broadcast/ spread sand/ sediment to replenish soils.

California Gnatcatcher

MgG2 Species Action-11. Control non-native annual grasses and other invasive species Maintain healthy stands of sage scrub vegetation by controlling non-native annual grasses and other invasive species

Methods

- Mechanical removal
- Grazing
- Herbicides
- Other methods with proven efficacy

MgG2 Species Action-12. As needed, e.g., post wildfire, re-vegetate areas with sage scrub

Cactus Wren

MgG2 Species Action-13. Control non-native annual grasses and other invasive species adjacent to cactus stands

Methods

- Mechanical removal
- Herbicides
- Grazing
- Other methods with proven efficacy

MgG2 Species Action-14. As needed, e.g., post wildfire, harvest and plant cactus cuttings to restore cactus patches

Santa Ana River Woolly-star

MgG2 Species Action-15. Control invasive exotic plants within and on the outer edges of extant populations (see control methods above).

MgG2 Species Action-16. Broadcast/ spread sand/ sediment to replenish soils

Management Goal 3 Stewardship Actions

MngGoal-3. Control impacts from areas adjacent to the management units, such as trash dumping, trespass, off road vehicle use and other intrusions.

MgG2 Stewardship Action-1. Place and maintain boundary signs informing the public about the conservation areas

MgG2 Stewardship Action-2. Patrol the conservation areas addressing to identify and report illegal activities and identify illegal access points

MgG2 Stewardship Action-3. Coordinate with local entities (Cities of Highland and Redlands, County of San Bernardino and the Bureau of Land Management) to limit adverse impacts

MgG2 Stewardship Action-4. Place barriers to limit access

MgG2 Stewardship Action-5. Place boulders and/or fencing, and gates on the perimeter of the conservation areas to prevent unauthorized uses including off-road vehicle trespass.

MgG2 Stewardship Action-6. Remove trash and clean-up illegal dump sites

Monitoring Goals and Actions

Monitoring Goal 1 Habitat-based Actions

MonGoal-1. Actively monitor the status and trends of all covered species.

MnG1 Habitat Action-1. Monitor post fire recruitment of listed species and their habitat

MnG1 Habitat Action-2. Establish vegetation transects to determine post fire re-establishment of federally listed plant species, RAFSS, and sage scrub.

Monitoring Goal 1 Species-based Actions

Slender-horned Spineflower

MnG1 Species Action-1. Annually check each extant occurrence for presence/absence.

Map the size and extent of each occurrence and estimate the number of individuals from sample quadrats. After the first five years of the permit, the interval of this task may be lengthened to every two to three years if populations are stable or expanding.

MnG1 Species Action-2. Check historic sites for reoccurrence. Document any re-occurrences.

MnG1 Species Action-3. Conduct baseline survey for new occurrences and document any that are found.

MnG1 Species Action-4. Establish sample plots to monitor the effectiveness of management and restoration efforts for purposes of conducting adaptive management.

Santa Ana River Woolly-Star

MnG1 Species Action-5. Establish representative sample plots in the conservation areas to monitor status and trends including percent cover of woolly-star and competitors.

MnG1 Species Action-6. Conduct a comprehensive inventory every five years to determine the species current distribution in the Wash Plan area.

MnG1 Species Action-7. Establish sample plots in select areas to determine the effectiveness of management methods for purposes of adaptive management

San Bernardino kangaroo rat

MnG1 Species Action-8. Establish and survey permanent sample plots, using stratified random sampling in the conservation areas, to determine percent area occupied, and in select subareas, relative abundance.

- Conduct baseline survey
- Develop appropriate sampling interval to monitor trends

MnG1 Species Action-9. Establish and survey sample plots to determine the effectiveness of management techniques.

Note: SBKR sample plots would be established in association with vegetation transects to determine correlates with SBKR presence.

Coastal California gnatcatcher

MnG1 Species Action-10. Monitor status and trends of CAGN by conduct periodic surveys:

- To determine the location and number of CAGN and active CAGN nests in the conservation areas; and
- To determine the location and extent of intermediate and mature seral stages of Riversidean Alluvial Fan Sage Scrub and Coastal Sage Scrub in the conservation areas.

Note: Monitoring of suitable vegetation for CAGN would be done in conjunction and coordination with general vegetation monitoring efforts.

Cactus wren

MnG1 Species Action-11. Monitor status and trends of cactus wren by conduct periodic surveys:

- To determine the location and number of cactus wrens and active cactus wren nests in the conservation areas; and
- To determine the location and extent of cactus in the conservation areas, including cactus suitable to support nesting cactus wrens.

Note: Monitoring of suitable vegetation for cactus wren would be done in conjunction and coordination with general vegetation monitoring efforts.

Monitoring Goal 2 Adaptive Management-based Actions

MonGoal-2. Practice adaptive management to ensure that the most effective and highest priority management actions are implemented. Use an adaptive management approach to species and habitat management which will allow for adjustments to management prescriptions based on new information obtained as the management plan is implemented.

MnG2 AM Action-1. The reserve management committee and the reserve manager will:

- Will work to identify and incorporate new, more effective management methods and technologies as they become available.

- Adjust management actions/prescriptions as needed, based on the results of monitoring data.
-

MnG2 AM Action-2. Prioritize management actions based on current conditions including the evaluating and addressing new threats to federally listed species and their habitats.

5.2.1 Spineflower Conservation, Management and Monitoring

[Discuss with USFWS relative to Biological Goals, Objectives, and Actions]

Newly Conserved

[Update with Calculations.] See Figure 19. Only limited surveys for Spineflower have occurred on Newly Conserved Lands; there is one record of Spineflower occurrence from 1997. There is low-to-no probability that Spineflower habitat would be adversely affected by Covered Activities on Newly Conserved lands, including habitat management and the SBVWCD's Phase 3 water conservation facilities.

Additionally Managed

There are 46 records of Spineflower occurrence on Additionally Managed lands. Management of these lands and implementation of the Spineflower relocation and habitat enhancement program identified in the Wash Plan will entail modifications of Spineflower habitat. However, no net loss of Spineflower is expected as a result of Covered Activities on these lands.

The focus of the AMMP for Spineflower is maintaining existing populations on Additionally Managed Lands (and any found on Newly Conserved Lands) and initiating implementation of the relocation and enhancement program.

Spineflower Data Collection

Some Newly Conserved and Additionally Managed Lands have not been surveyed for Spineflower. To help guide management and monitoring decisions, Spineflower surveys will be conducted by a qualified botanist in those areas prior to the application of any habitat management techniques to those areas. All such surveys will be completed no later than year 3 of HCP implementation.

Spineflower Relocation and Enhancement Program

Working in cooperation with BLM, USFWS, and CDFW, test plots will be identified on Additionally Managed Lands (and on Newly Conserved Lands, if Spineflower are found there) for Spineflower relocation and habitat enhancement techniques. The study design will be developed based on the recommendations prepared by USFWS for the Wash Plan in 2007, with refinements made based on consultations with CDFW and other experts on Spineflower. A five-year study will be conducted to determine if relocation and enhancement show adequate promise to be accepted by USFWS and CDFW as feasible conservation and mitigation measures for impacts to Spineflower. Development of this program is part of the mitigation for the impacts to Spineflower from the incidental take

allowed during the first five years of implementation. The measures identified through the program will be the measures applied as mitigation for incidental take of the previously-avoided Spineflower in the Mining Impact Area.

Spineflower Population Monitoring

Monitoring plots will be established at the same time that study plots are identified for the relocation and enhancement program. The process and criteria for selecting the monitoring plots and determination of the monitoring data to be collected will be developed in cooperation with USFWS and CDFW; collection of data at the plots will begin no later than year 5 of plan implementation.

5.2.2 Woollystar Conservation, Management and Monitoring

[Discuss with USFWS relative to Biological Goals, Objectives, and Actions]

Newly Conserved

Newly Conserved lands include at least 553 locations where Woollystar have been recorded. Habitat management of Newly Conserved lands may entail some take and temporary habitat impacts to Woollystar. There is a low probability that the SBVWCD's Phase 3 water conservation facilities would affect Woollystar, which occur on the edges on the area designated for the facilities (Figure 20)

Additionally Managed

Additionally Managed lands include 521 locations where Woollystar have been recorded. Habitat management may entail some take and temporary habitat impacts to Woollystar. There is a low probability that the SBVWCD's Phase 3 water conservation facilities would affect Woollystar, which occur on the edges on the area designated for the facilities.

The focus of the AMMP for Woollystar is managing non-native grasses and forbs and ongoing monitoring of Woollystar populations.

Woollystar Habitat Management and Enhancement

Management of Woollystar habitat will include the control measures for non-native grasses and forbs identified for SBKR. An assessment of non-native grass and forb occurrence will be conducted at the same time as the SBKR habitat assessment, and sites will be identified and prioritized for management. Where possible, sites will be identified that include both SBKR and Woollystar habitat. The assessment will be conducted using aerial imagery and in field observations. Criteria for ranking sites, the methods to be used at each site, and criteria for evaluating the success of the measures will be subject to review by USFWS. Implementation and evaluation of the measures in Woollystar habitat will occur in the same time-frame and manner as the measures in SBKR habitat.

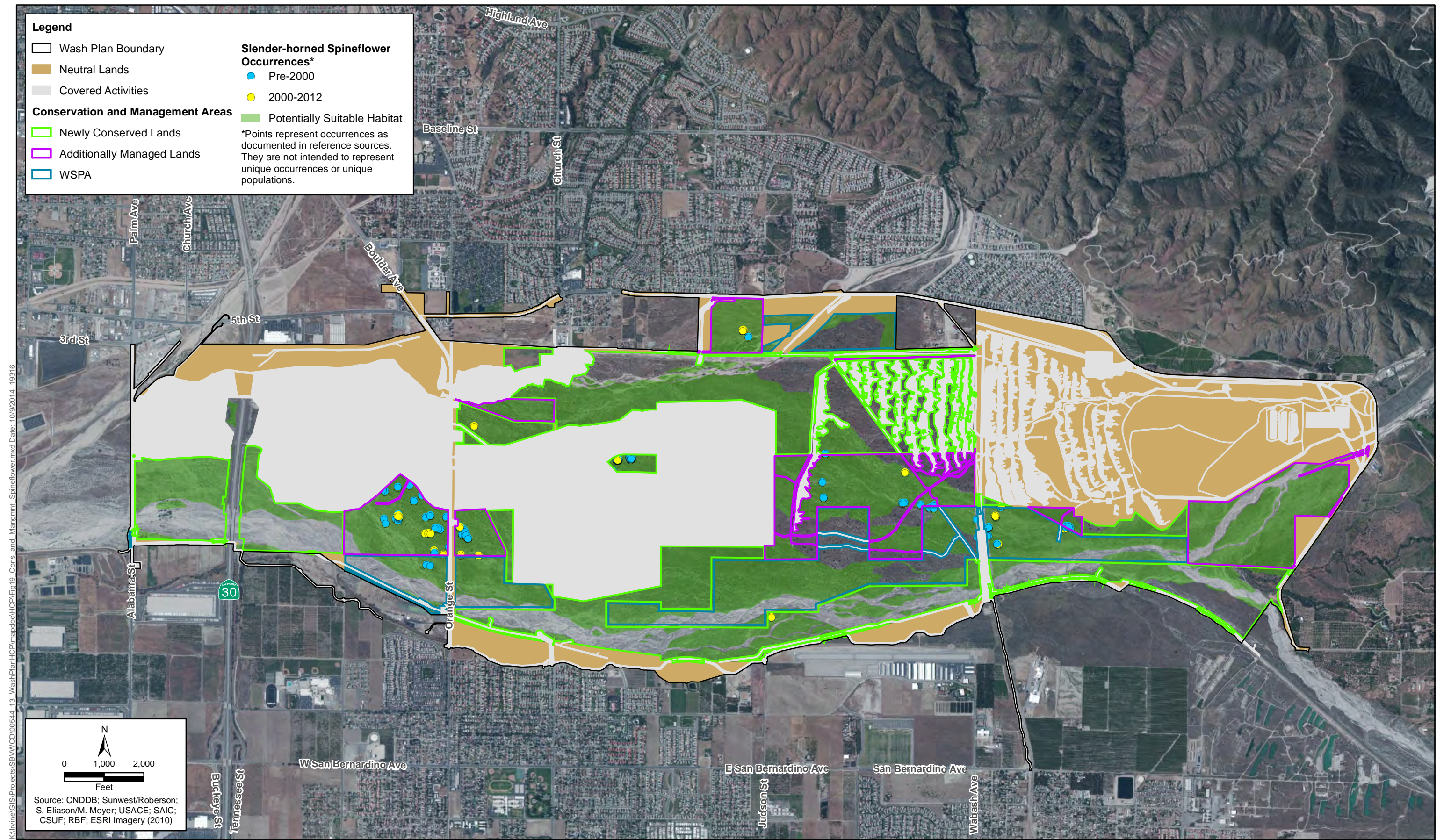


Figure 19
Conservation and Management
for Slender-horned Spineflower
Wash Plan HCP

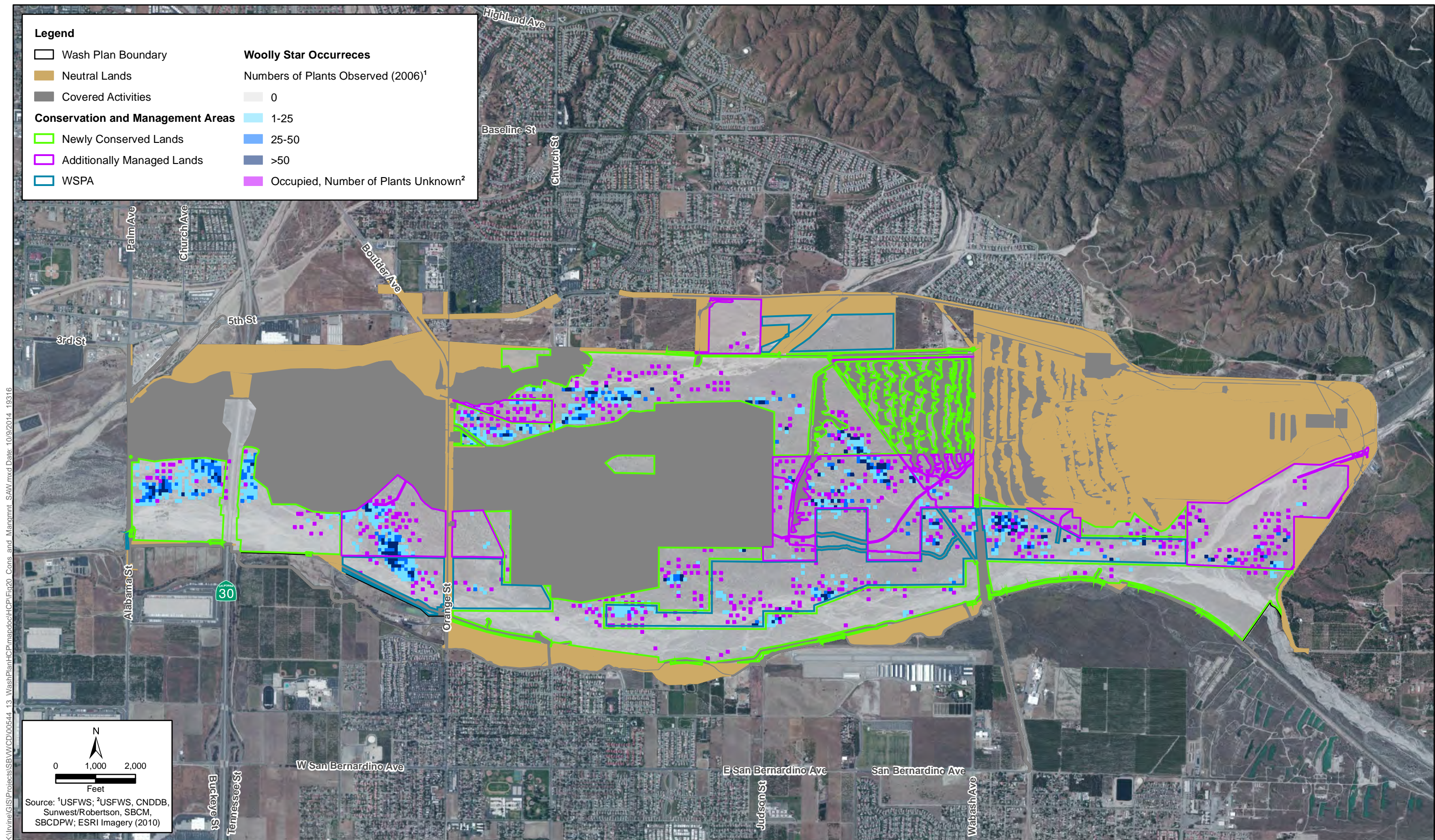


Figure 20
Conservation and Management for
Santa Ana Woolly Star Occurrences
Wash Plan HCP

Woollystar Population Monitoring

Grids previously surveyed on Newly Conserved and Additionally Managed Lands will be selected for ongoing monitoring of Woollystar populations. The process and criteria for selecting the monitoring grids and the monitoring data to be collected will be provided to USFWS and CDFW for review no later than year 5 of HCP implementation. Monitoring will begin no later than year 6 of plan implementation.

5.2.3 Gnatcatcher Conservation, Management and Monitoring

[Discuss with USFWS relative to Biological Goals, Objectives, and Actions]

Newly Conserved

Newly Conserved lands include approximately 704 acres of foraging habitat and 31 acres of potential nesting habitat for Gnatcatcher. Habitat management may entail some temporary impacts to foraging habitat. Up to 51 acres of foraging habitat would be removed in the area designated for the SBVWCD's Phase 3 water conservation facilities (see Figure 21). No adverse impacts to nesting habitat are anticipated. There is a high likelihood that the nesting habitat ultimately will support Gnatcatchers.

Additionally Managed

There are approximately 587 acres of foraging habitat and no acres of potential nesting habitat on the Additionally Managed lands. Habitat management may entail some impacts to foraging habitat. A portion of the area designated for the SBVWCD's Phase 3 facilities includes Additionally Managed Lands, and Gnatcatcher foraging habitat would be affected if the facilities are developed in that area. .

Management of Gnatcatcher foraging habitat will occur as part of non-native controls and related measures for SBKR and Woollystar. If nesting Gnatcatchers occur in the Plan Area, an adaptive management program to maintain and potentially expand nesting habitat will be developed and implemented. The nesting habitat management program will be subject to review by USFWS.

5.2.4 Cactus wren Conservation, Management and Monitoring

[Discuss with USFWS relative to Biological Goals, Objectives, and Actions]

Newly Conserved

Newly Conserved lands include approximately 704 acres of foraging habitat and 31 acres of potential nesting habitat for Cactus wren. Habitat management may entail some temporary impacts to foraging habitat. Up to 51 acres of foraging habitat would be removed in the area designated for the SBVWCD's Phase 3 water conservation facilities (see Figure 22). No adverse impacts to nesting habitat are anticipated. There is a high likelihood that the nesting habitat ultimately will support Cactus wrens.

Additionally Managed

There are approximately 587 acres of foraging habitat and no acres of potential nesting habitat on the Additionally Managed lands. Habitat management may entail some impacts to foraging habitat. A portion of the area designated for the SBVWCD's Phase 3 facilities includes Additionally Managed Lands, and Cactus wren foraging habitat would be affected if the facilities are developed in that area.

Management of Cactus wren foraging habitat will occur as part of non-native controls and related measures for SBKR and Woollystar. If nesting Cactus wrens occur in the Plan Area, an adaptive management program to maintain and potentially expand nesting habitat will be developed and implemented. The nesting habitat management program will be subject to review by USFWS.

5.2.5 SBKR Conservation, Management and Monitoring

[Discuss with USFWS relative to Biological Goals, Objectives, and Actions]

Newly Conserved

Newly Conserved lands include approximately 735 acres of SBKR habitat (283 acres with "high," 155 acres with "moderate," and 297 acres with "low" suitability for SBKR). Habitat management may entail some incidental take of SBKR and temporary impacts to suitable habitat. Up to 51 acres of habitat disturbance would be allowed in a joint use area designated for the SBVWCD's Phase 3 water conservation facilities (see Figure 23). The habitat within the Phase 3 area has low potential suitability for SBKR.

Additionally Managed

Additionally Managed lands include approximately 598 acres of SBKR habitat (315 acres with "high," 201 acres with "moderate," and 82 acres with "low" suitability for SBKR). Habitat management may entail some incidental take of SBKR and temporary impacts to suitable habitat. A portion of the area designated for the SBVWCD's Phase 3 facilities includes Additionally Managed Lands, and SBKR habitat would be affected if Phase 3 facilities are developed in that area.

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.

SBKR Habitat Management and Enhancement

Areas within Newly Conserved and Additionally Managed Lands will be managed and enhanced for the benefit of SBKR, primarily through measures to control non-native grasses and forbs and reducing the density of shrub cover.

Controlling Non-Native Grasses and Forbs

Efforts to control of non-native grasses and forbs will be planned and conducted in phases. In the first year of HCP implementation, SBKR habitat on Newly Conserved and Additionally Managed Lands will be assessed for the occurrence of non-native grasses and forbs and sites will be identified

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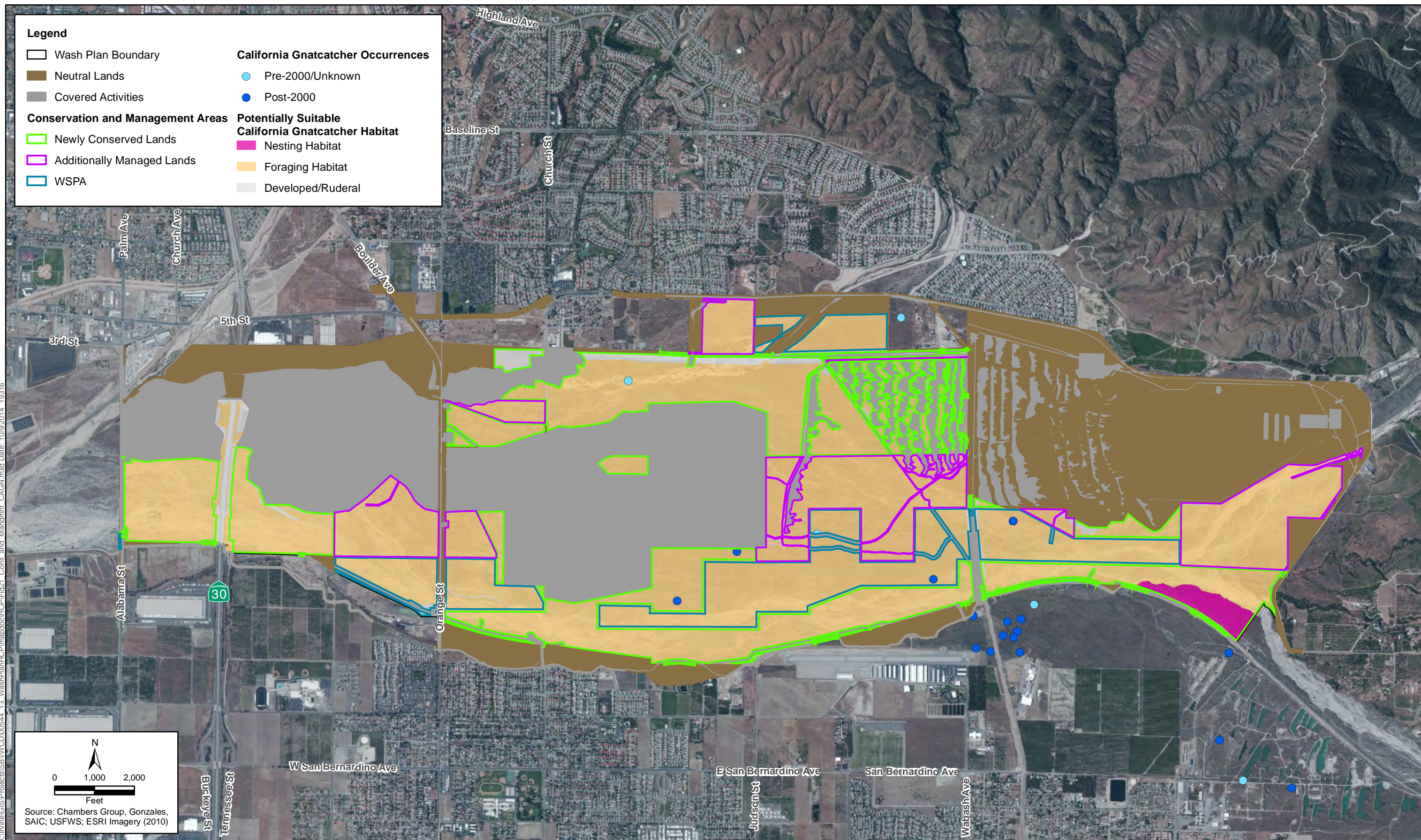
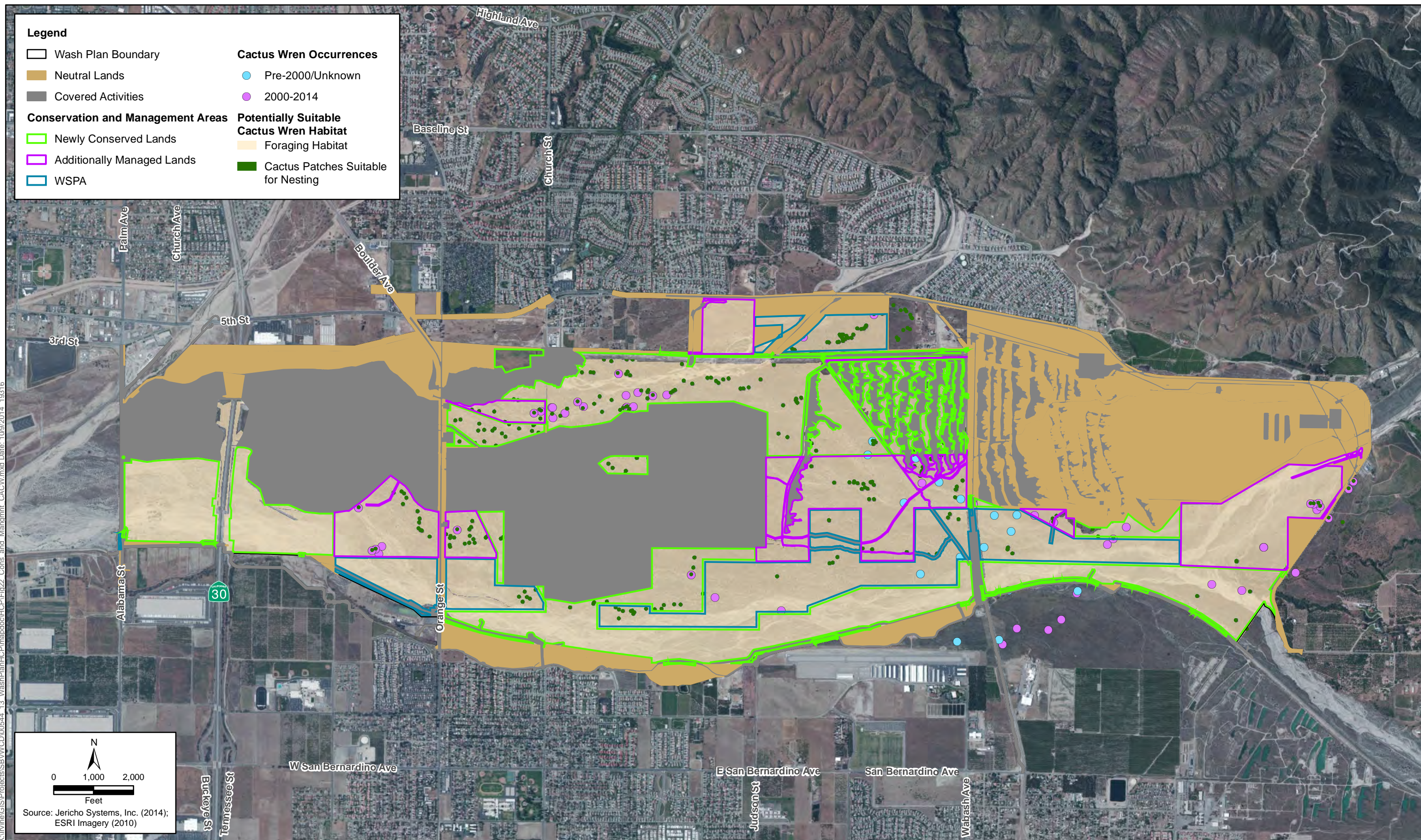
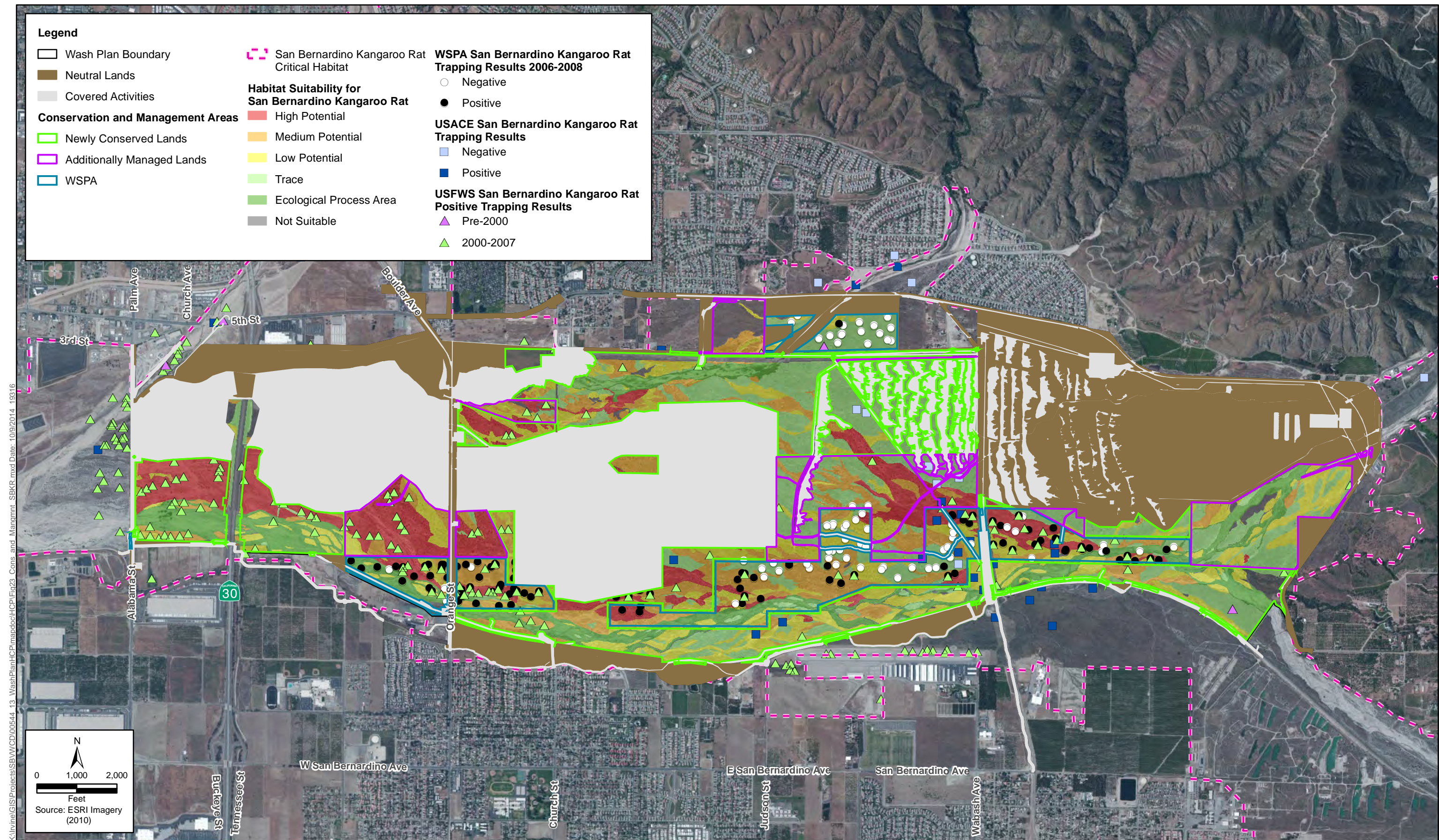


Figure 21
Conservation and Management
for California Gnatcatcher
Wash Plan HCP

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Figure 23
Conservation and Management for
San Bernardino Kangaroo Rat
Wash Plan HCP

and prioritized for management. Where possible, sites will be identified that include both SBKR and Woollystar habitat. The assessment will be conducted using aerial imagery and in field observations. Criteria for ranking sites, the methods to be used at each site, and criteria for evaluating the success of the measures will be subject to review by USFWS.

Implementation will be scheduled so that management measures have been initiated in the highest priority sites no later than year three of HCP implementation. The effectiveness of measures applied to an individual site will be evaluated and changed as needed if monitoring data for two consecutive years indicate that success criteria are not being met. The overall effectiveness of the measures in maintaining and enhancing habitat for SBKR will be evaluated after the highest priority sites have been managed and monitored for five years.

Reducing Shrub Cover

Reducing the density of shrub cover in select areas has the potential to maintain or re-establish conditions suitable for SBKR on Newly Conserved and Additionally Managed Lands, especially in areas no longer scoured by flood events. Potential sites for shrub cover reduction will be identified at the same time as the assessment of SBKR habitat for non-native grasses and forbs. Three sites will be selected as study plots for testing and refining shrub removal techniques. Criteria for selecting study plots, the methods to be used at each plot, and criteria for evaluating the success of the measures will be subject to review by USFWS. The implementation of measures on the study plots will be initiated no later than year three of HCP implementation. The effectiveness of the techniques in maintaining or re-establishing conditions suitable for SBKR will be evaluated after the study plots have been managed and monitored for five years. If the evaluation demonstrates that the technique is effective, the measures will be applied to other sites. The other sites will be selected based on criteria determined as part of the five-year evaluation.

SBKR Population Monitoring

SBKR occurrence on some Newly Conserved and Additionally Managed Lands is not well known. Trapping will occur in select areas during the first three years of HCP implementation, so that management goals and strategies can be more clearly defined. The recommended methodology is to use a series of small 5×5 grids (25 total traps per grid) set at 7-meter spacing; the “footprint” of each grid would be 28 meters × 28 meters (= 784 m² or 0.784 ha).

A method for ongoing monitoring of SBKR populations on Newly Conserved and Additionally Managed Lands will be developed and submitted to USFWS for review no later than year 5 of HCP implementation. Methods may include but are not limited to establishment of monitoring plots and/or presence/absence surveys.

Monitoring and Maintaining SBKR Movement Corridors

SBKR movement corridors are essential to the dispersal of SBKR into areas of suitable habitat as seral stages change and to the genetic health of the local SBKR population. Two types of management actions will be applied to Newly Conserved and Additionally Managed Lands to ensure that SBKR can move across the landscape, especially between Plunge Creek and the Santa Ana River:

1. Managing long-linear strips of habitat to maintain relatively open conditions conducive to SBKR movement; and
2. If feasible, re-establishing a movement corridor over D-dike.

To maintain or replicate corridor conditions, management measures will be used to remove grasses and forbs and reduce shrub cover in long linear strips. There will be larger patches of suitable habitat where SBKR could reside along the linear strip. The strips would be at least as wide as the average dirt road (which are known to be used SBKR), approximately 7 meters in width, with live-in patches of suitable habitat at least 15 meters x 15 meters in size and spaced at least every 100 meters (the distance SBKR can move within a single evening). The ultimate goal would be to increase movement of SBKR between two larger occupied areas that may be currently separated by less suitable habitat. A study "strip" for this technique will be identified as part of the vegetation and species occurrence database updates in year three of HCP implementation. Criteria for selecting the study strip, the methods to be applied, and criteria for evaluating success will be subject to review by USFWS. The measures will be initiated at the study strip no later than year five of HCP implementation, and their effectiveness will be evaluated after the strip has been managed and monitored for five years. If the evaluation demonstrates that the technique is effective, the measures will be applied to other sites.

Once vegetation management techniques have been applied to the southeast trending corridor between Plunge Creek and the Santa Ana River, one or more crossings of D-dike will be considered. Based on conceptual plans, the crossing(s) would need to be approximately 10 meters wide, constructed of a suitable sandy substrate, and strategically placed where trapping results indicate presence of SBKR and/or where historical scouring has occurred. A native seed mix would be applied to achieve sparse vegetative cover. Although there are several potential designs for crossing D-dike, the simplest may be to create an earthen land bridge with a perpendicular culvert underneath to allow unrestricted flow of percolation water. Figure 11 shows potential locations for crossings. The SBVWCD will consult with a qualified SBKR biologist and USFWS to select a corridor design that is cost-effective and biologically functional. Final decisions regarding the corridor(s) across D-dike would not occur until year 10 of HCP implementation (or later).

SBKR Habitat Suitability Model Update and Evaluation

The SBKR habitat suitability model will be used in connection with assessing habitat conditions and monitoring plan implementation, with the model's databases and parameters updated and refined as needed. The first update and evaluation will occur when the vegetation database for the Plan Area has been updated. Criteria for evaluating the effectiveness of the model will be established as part of the AMMP. The efficacy of the model as a planning and monitoring tool will be evaluated at least every five years.

5.2.6 Habitat Management Treatment Areas

An important part of the adaptive management of the Newly Conserved and Additionally Managed areas is the application of a number of habitat management treatments. The primary focus of these management treatments is to control and reduce the extent of nonnative grasses and other invasive plants that reduce the habitat quality for SBKR and compete with the spineflower and woollystar.

There are five basic habitat management treatments planned in various parts of the Plan Area, which could be applied with a full and extensive treatment, a partial treatment, or a spot treatment, depending on the context of the particular area and the applicability of the selected treatment type(s).

Spot Treatment: Limited to herbicide application to control very localized invasive plant issues.

Partial Treatment: Includes herbicide application in a broader area, typically in combination with one or two additional treatment methods including thinning, mowing, grazing, or controlled burning.

Full Treatment: Includes herbicide application and two or three other treatment types, typically over a larger area where the invasive plant issue is more extensive and/or a larger threat.

Figure 24 shows the proposed locations of Spot, Partial, and Full treatment areas, which were identified based on field observations and aerial photo delineation of the extent of the invasive plant distribution and density.

5.2.7 Habitat Restoration and Maintenance

There are a number of additional activities contemplated that would be necessary to improve and maintain habitat quality in the Plan Area. One such activity is the removal of the Santa Ana River levee near the eastern boundary (Greenspot Road) of the Wash area that will restore regular flooding and scour to a significant habitat area on the site. Additional work is planned for Plunge Creek, where vegetation will be removed and thinned. In addition, the stream course will be widened. This project is intended to restore natural scour patterns on approximately 30 acres.

San Bernardino County Flood Control District dedicated 365.5 acres of alluvial habitat in the active channel immediately south of the Woolly Star Preservation Area (WSPA) in the Santa Ana River Wash. This property dedication provides an important linkage between the main river channel and the WSPA and results in more than 700 contiguous acres of quality habitat. The dedicated property is intended to mitigate for routine maintenance and emergency repair activities on Flood Control District facilities within the Wash Plan area in the Santa Ana River, and on Mill, Plunge, City and Elder Creeks. Additionally, acreage dedicated in excess of that needed to cover Flood Control District mitigation for maintenance needs shall be used by the Flood Control District to provide future mitigation for Flood Control District infrastructure construction, maintenance and permitting activities in ecologically-similar areas outside the Wash Plan area, as needed. The Cities of Highland and Redlands also have similar land or mitigation credit dedications.

Habitat management activities may include seed collection, herbicide application to control invasive plant species, hand thinning of vegetation, prescribed burning to control invasive annual grasses, and sheep grazing. Planning for all management activities will include input from resource agencies and Task Force participants.

Land dedication, habitat restoration and maintenance activities are described below:

- Construction and Maintenance of Enhanced Facilities (114.6 acres total)
 - Greenspot Road levee removal (4.6 acres)
 - Plunge Creek Habitat Management (110.0 acres)
- Easement and Land Dedication, including management activities (390.5 acres)
 - Enhanced Spreading Basin Habitat Dedication (25 acres)
 - Flood Control Property Dedication (365.5 acres)
 - Other temporal impacts for restoration efforts (undefined)

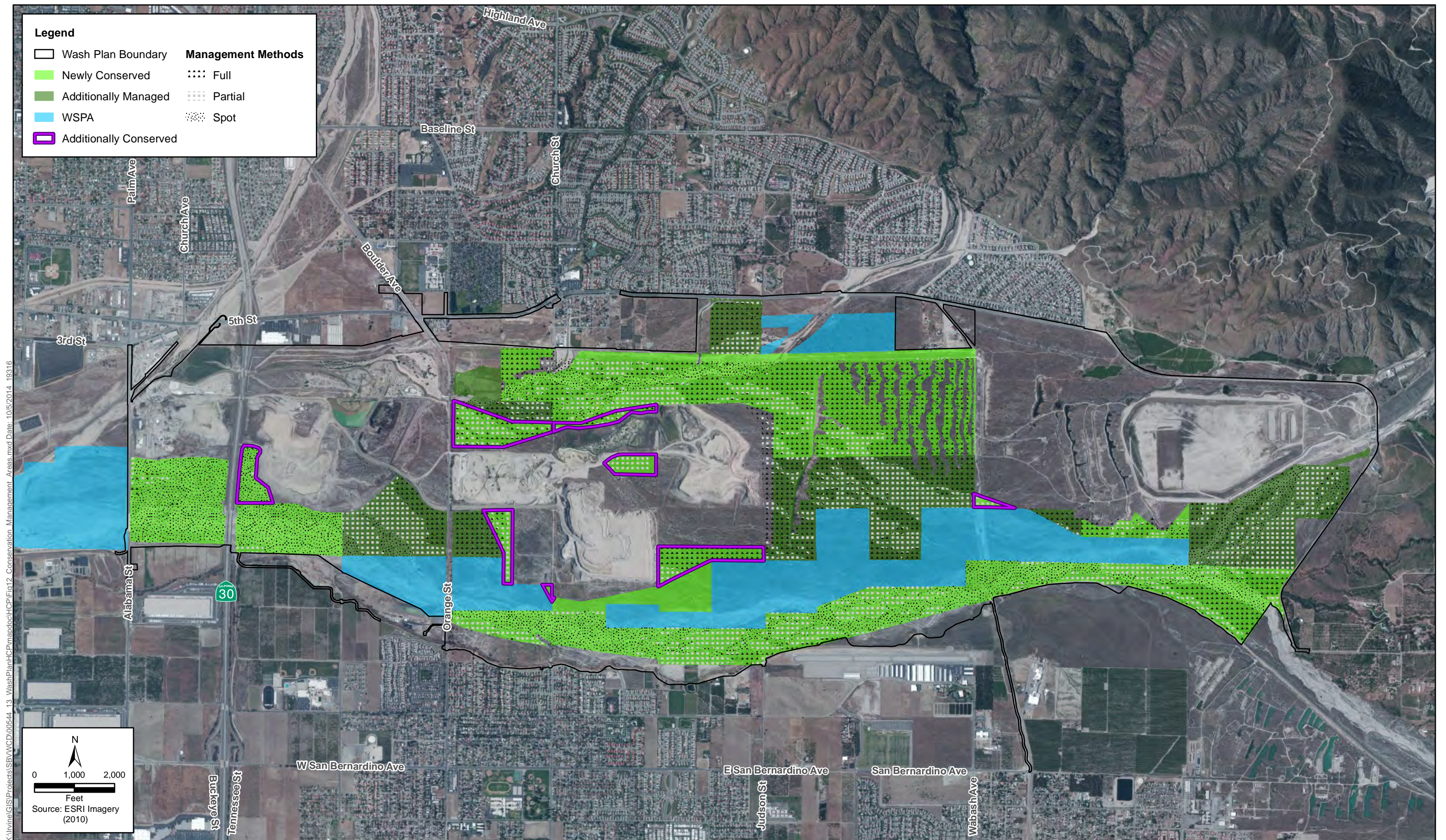
5.3 Adaptive Management and Monitoring Program

This section describes the Adaptive Management and Monitoring Program (AMMP) for the Plan. The purposes of this program are to ensure compliance with the Plan; to assess the status of covered species in the Plan Area; and to evaluate the effects of management actions such that the biological goals and objectives of the Plan are achieved. Adaptive management and monitoring will be integrated into one cohesive program where monitoring will inform and change management actions to continually improve outcomes for covered species. An overview of the program, monitoring and management actions, and data and reporting requirements are found below.

The AMMP is intended to be implemented on the Newly Conserved and Additionally Managed Lands within the Plan Area, and are not prescriptions for activities within the WSPA, which is managed under a separate habitat management plan.

5.3.1 Regulatory Context

By regulation, an HCP must incorporate monitoring of conservation measures and the response of covered species to these measures (50 CFR 17.22[b][1][iii] and 50 CFR 222.22[b][5][iii]). An adaptive management strategy is a recommended component of Plans with data gaps that would substantively affect how the species is managed and monitored in the future (65 FR 35251). The USFWS and NMFS Five-Point Policy (65 FR 35241–35257) describes adaptive management as an integrated method for addressing uncertainty in natural resource management and states that management must be linked to measurable biological goals and monitoring. Section 5-2 of this HCP integrates biological goals and objectives, and conservation actions, with monitoring actions to ensure that the AMMP evaluates the success of the conservation actions to achieve the biological goals and objectives.



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5.3.2 Adaptive Management

Adaptive Management is a decision-making process promoting flexible management such that actions can be adjusted as uncertainties become better understood or as conditions change. Monitoring the outcomes of management is the foundation of an adaptive approach, and thoughtful monitoring can both advance scientific understanding and modify management actions iteratively (Williams et al. 2007).

Adaptive management is necessary because of the degree of uncertainty and natural variability associated with ecosystems and their responses to management. Based on the best scientific information currently available, it is expected that the Plan's conservation actions will effectively implement the conservation actions described in Section 5.2. However, there are varying degrees of uncertainty associated with the management techniques and conditions within and outside the plan area. In addition, the status of covered species and natural communities may change in unexpected ways during Plan implementation. It is possible that additional and different management measures not identified in the HCP will be identified in the future and proven to be more effective in implementing the conservation action described in Section 5.2 than those currently implemented. Results of effectiveness monitoring may also indicate that some management measures are less effective than anticipated. To address these uncertainties, an adaptive approach will be used to inform management; the monitoring program will be designed to support this adaptive approach.

The adaptive management process will be administered by the San Bernardino Valley Water Conservation District, who will coordinate and share the results of monitoring and targeted studies, as appropriate with the wildlife agencies. A well-coordinated and scalable monitoring program will enable the Conservation District to measure and evaluate change in resources and threats within the Plan Area.

In summary, adaptive management is the land manager's response to new information. Adaptive management actions will likely take place at the following junctures:

1. In response to the results of targeted studies including pilot projects,
2. In response to downward trends in the status of covered species or key natural-community variables,
3. When new information from the literature or other relevant research indicates that a feasible and superior alternative method for achieving the biological goals and objectives exists,
4. When monitoring indicates that the expected or desired result of a management action did not take place, and
5. Proactively, when threats are identified through the monitoring efforts in the Plan Area.

Most adaptive management measures will occur when conservation actions do not produce the desired outcome or when species trends decrease. In these cases, new actions would be implemented to try and improve the outcome for species. Such actions include but are not limited to the following:

1. Alter the timing, location, intensity or type of grazing;

2. Reduce, increase or otherwise change the pattern of prescribed burning;
3. Change the flow regime in target streams (e.g., timing, frequency, magnitude of flow levels or events);
4. Re-evaluate and, if necessary, alter avoidance and minimization measures;
5. Modify age, timing, location, or type of seedling transplantation for vegetation community restoration;
6. Prioritize or de-emphasize one aspect of noxious weed control such as targeted pesticide use;
7. Increase, decrease or desist species-specific conservation actions such as translocation of individuals based on experimental results.

Any of the conservation actions proposed in Section 5.2 can be modified in response to new information following the principles of adaptive management.

5.3.3 Program Objectives

The overarching objective of the AMMP is to ensure that the conservation action described in Section 5.2 and associated biological goals and objectives are being achieved. This chapter presents a foundation for accomplishing this task. Additional objectives of the monitoring and adaptive management program are listed below.

1. Provide an organizational framework and decision-making process for evaluating monitoring, targeted studies, and other data to adjust management actions.
2. Document the baseline condition of biological resources in the Plan Area using existing data, modeling, and the results of ongoing field surveys.
3. Develop conceptual models for natural communities and covered species, if applicable, that can be used as the basis for collecting information, verifying hypotheses, and designing and changing management practices.
4. Incorporate hypothesis testing and experimental management, including targeted studies to address key uncertainties and to improve management and monitoring efforts.
5. Develop and implement scientifically valid monitoring protocols at multiple levels to ensure that data collected will inform management and integrate with other monitoring efforts.
6. Ensure that monitoring data are collected, analyzed, stored, and organized so the data are accessible to San Bernardino Valley Water Conservation District, the Permittees, regulatory agencies, scientists and, as appropriate, the public.

5.4 General Impact Avoidance and Minimization Measures

To avoid and minimize actual instances of take and reduce the effects of unavoidable take, the following measures will apply to Covered Activities in the Plan Area (Table 5-3). [Link Measures to Avoid and Minimize Take more directly to proposed Covered Activities. Use covered activity codes.]

Table 5-3. Identification of Avoidance and Minimization Measures Applicable to Covered Activities

Covered Activity Type and Code	Avoidance and Minimization Measures
To be completed	1. Prior to land disturbance in a designated impact area, the covered party will be responsible for the following measures as applicable:
	a. Conduct surveys for Spineflower if suitable habitat is present and the area has not been surveyed for Spineflower;
	b. Provide USFWS and CDFW with the opportunity to collect Woollystar seed and salvage Spineflower for the relocation program; and
	c. Identify sensitive resources adjacent to the impact area and use onsite monitors and temporary fencing to prevent impacts to those resources
	2. [Reevaluate with USFWS & CDFW] Take of Spineflower in the center of Section 11 in the Mining Area (between the existing quarries) shall be avoided until USFWS and CDFW have determined that the Spineflower enhancement and relocation program is successful or decide to modify or abandon the program. If the program is successful, take of the previously avoided Spineflower will be mitigated through implementation of the applicable relocation and enhancement measures. If the program is abandoned or modified, take from that point on will be mitigated through measures determined in cooperation with USFWS and CDFW at that time. Failure of the Spineflower enhancement and relocation program will constitute a Changed Circumstance.
	3. The SBVWCD's Phase 2 and 3 water conservation projects will be planned and designed to limit total habitat impacts to 31% of the total acreage within each Phase (92 and 51 acres, respectively) and to avoid impacts to Spineflower (if found to occur in the areas).
	4. All covered mining activities shall be conducted within the Mining Impact Area; impacts shall not extend into adjacent habitat, regardless of whether the adjacent habitat is conserved or not.

Covered Activity Type and Code	Avoidance and Minimization Measures
	5. All covered road and bridge projects improvements shall be conducted within the Road Impact Area; impacts shall not extend into adjacent habitat, regardless of whether the adjacent habitat is conserved or not.
	6. O&M activities by the SBVWCD and SBCFCD within the Plan Area shall be conducted to minimize the potential for direct harm to individual SBKR or Gnatcatcher that might be incidentally present.
	7. If a Covered Activity would entail vegetation clearing or ground disturbance in an area with Gnatcatcher foraging or nesting habitat. Gnatcatcher surveys will be conducted in the nesting season prior to the proposed activity. If Gnatcatcher nests are found in or near the impact area for the Covered Activity, vegetation clearing and ground disturbance will not be allowed during the Gnatcatcher breeding season (mid-February through mid-August) and may not proceed until after fledging occurs or it is demonstrated that the nest(s) have failed.
	8. Vehicular traffic off of maintained roads in Newly Conserved and Additionally Managed areas will be restricted to daylight hours to avoid road kill of SBKR, except for emergency response.
	9. New and improved roads and bridges will be limited to those identified in the list of Covered Activities.
	10. Public trails will make use of existing roads and pathways to the maximum extent possible.
	11. Covered Activities on Newly Conserved and Additionally Managed Lands will be conducted to avoid take of covered species to the maximum extent possible, and the habitat impacts on these lands resulting from the SBVWCD's Phase 3 water conservation facilities shall not exceed 52 acres.
	12. Implementation of the impact avoidance and minimization measures will be overseen by a biological monitor with qualifications acceptable to USFWS and CDFW (also see "Compliance Monitoring and Reporting").

5.5 GIS Database and Vegetation Map Updates

A GIS database for management and monitoring will be established and maintained for the duration of HCP implementation. The database will include but not be limited to property ownership, conservation easements, utility and road easements and rights of way, existing facilities and land uses, Plan Area boundaries, the boundaries of Plan Area subcomponents, vegetation types, species occurrence records, watersheds, location of monitoring and study plots, areas where habitat has been removed by Covered Activities, areas where habitat has been enhanced under the HCP, and other information relevant to plan implementation.

The vegetation database will be updated based on an infield assessment and use of aerial imagery within three years of plan and ITP approval. Thereafter, the vegetation data base will be updated at least every five years. Species occurrence layers will be updated as new data become available, with the update made on a scheduled basis and at least annually.

5.6 Existing Conserved Areas within the Plan Area

There are several existing conservation areas within the Plan Area. While the acreages of habitat within these areas are not considered to offset and mitigate for the impacts of the covered activities, these areas do contribute to the overall success of the conservation strategy by contributing to the connectivity and total area of habitats conserved and managed for covered species. These existing conserved areas are discussed briefly below.

5.6.1 Santa Ana River Woollystar Preserve Area (WSPA)

The WSPA is an existing preserve established as mitigation for the effects of the Seven Oaks Dam on Woollystar. [Insert full description]

5.6.2 Robertson's Ready Mix Haul Road Mitigation Land

[Insert full description]

5.6.3 City of Highland Biological Mitigation Area

[Insert full description]

5.6.4 San Bernardino Flood Control Mitigation Area

San Bernardino County Flood Control District dedicated 365.5 acres of alluvial habitat in the active channel immediately south of the WSPA in the Santa Ana River Wash. This property dedication provides an important linkage between the main river channel and the WSPA and results in more than 700 contiguous acres of quality habitat. The dedicated property is intended to mitigate for routine maintenance and emergency repair activities on Flood Control District facilities within the Wash Plan area in the Santa Ana River, and on Mill, Plunge, City and Elder Creeks. Additionally, acreage dedicated in excess of that needed to cover Flood Control District mitigation for

maintenance needs shall be used by the Flood Control District to provide future mitigation for Flood Control District infrastructure construction, maintenance and permitting activities in ecologically-similar areas outside the Wash Plan area, as needed. The Cities of Highland and Redlands also have similar land or mitigation credit dedications.

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6.1 Plan Implementation

Implementation of the Wash Plan HCP begins when the Implementing Agreement (IA) is executed and the Section 10(a)(1)(B) incidental take permit is issued. Primary responsibility for Plan implementation rests with the permittees, with support by USFWS and CDFW to review annual reports and provide guidance and input as needed. The successful implementation of the conservation strategy, monitoring program, covered activities, and reporting that are part of the Plan require coordinated actions among the permittees and the wildlife agencies.

This chapter describes the overall implementation structure of the Plan, including institutional arrangements, organizational structure, approval processes, and roles and responsibilities of signatories to the Implementing Agreement.

6.2 Compliance Monitoring and Reporting

This HCP must be monitored over time to determine if implementation measures are achieving goals and objectives of the Plan. Two tracking processes will be undertaken: impacts and biological monitoring. Results of these efforts will be discussed at annual coordination meetings and in annual public reports.

6.2.1 Tracking of Conservation and Impacts

The SBVWCD as Program Administrator will be responsible for the annual accounting of the acreage, type, and location of vegetation communities conserved and impacted by permitted land uses and other activities within the Plan Area. Records will be maintained in a GIS database.

6.2.2 Annual Reporting

An annual public report will be prepared and distributed that will demonstrate compliance with the terms and conditions of the HCP, ITP, and IA. Amendments or administrative corrections will also be reported.

Annual reports will be prepared and submitted to USFWS by October 31 of each year to evaluate compliance with the HCP and to determine if the goals and objectives of the HCP are being met. These reports will include:

1. Results of the monitoring and management program for the covered species;
2. Habitat impacts from Covered Activities in the prior year;
3. Progress made in meeting the biological goals and objectives of the HCP;
4. Any instances of non-compliance with the terms of the ITP;

5. An accounting of expenditures and available funds for HCP implementation; and
6. Problems or issues identified during implementation and the steps taken or recommended to address them.

A copy of the report will be provided to CDFW.

If, after 10 years, the goals and objectives are being met, reporting can be decreased to every five years, with approval from USFWS.

6.3 Responses to Changed Circumstances

6.3.1 Summary of Circumstances

Section 10 regulations [(69 Federal Register 71723, December 10, 2004 as codified in 50 Code of Federal Regulations (C.F.R.), Sections 17.22(b)(2) and 17.32(b)(2))] require that an HCP specify the procedures to be used for dealing with changed and unforeseen circumstances that may arise during the implementation of the HCP. In addition, the HCP No Surprises Rule [50 CFR 17.22 (b)(5) and 17.32 (b)(5)] describes the obligations of the permittee and USFWS. The purpose of the No Surprises Rule is to provide assurance to the non-Federal landowners participating in habitat conservation planning under the ESA that no additional land restrictions or financial compensation will be required for species adequately covered by a properly implemented HCP, in light of unforeseen circumstances, without the consent of the permittee.

Changed circumstances are defined in 50 CFR 17.3 as changes in circumstances affecting a species or geographic area covered by an HCP that can reasonably be anticipated by the permittees and USFWS and for which contingency plans can be prepared (e.g., a fire, or other natural catastrophic event in areas prone to such event). If additional conservation and mitigation measures are deemed necessary to respond to changed circumstances and these additional measures were already provided for in the plan's operating conservation program (e.g., the conservation management activities or mitigation measures expressly agreed to in the HCP), then the permittee will implement those measures as specified in the plan. However, if additional conservation management and mitigation measures are deemed necessary to respond to changed circumstances and such measures were not provided for in the plan's operating conservation program, USFWS will not require these additional measures absent the consent of the permittee, provided that the HCP is being "properly implement" (properly implemented means the commitments and the provisions of the HCP and the IA have been or are fully implemented).

The Wash Plan HCP has identified and addresses seven Changed Circumstances that can be reasonably anticipated in the Plan Area: Climate Change, Fire, Drought, Flood, Invasion of Exotic Species, Future Listing of Non-Covered Species, and Failure of Spineflower Enhancement and Relocation Program. Each of these Changed Circumstances are described below.

Climate Change

There are clear scientific data indicating that alteration of the atmosphere is causing changes in climate, including increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising sea levels. In California, it is anticipated that there will be warmer temperatures (Cayan et al. 2006), greater extremes in weather, and larger variation between wet and dry years (Franco 2005) but precipitation patterns are more difficult to project (Lenihan et al. 2006). Higher nighttime temperatures are predicted, perhaps altering days of frost, daily temperature extremes, and distribution of some species (IPCC 2007). Some of the most dramatic potential climate change impacts include increased frequency and severity of extreme events, such as heat waves, wildfires, and flooding (Lenihan et al. 2006, IPCC 2007). To accommodate shifts in distribution, species will need a range of large core habitat areas connected by landscape-level linkages (Franco 2005). The species most at risk are those that have specific habitat requirements, have limited ability to relocate, or are surrounded by development (leaving few relocation options) (NPS 2006).

Although the extent and nature of impacts from climate change within the Plan Area are unknown, some climatic models suggest that there may be changes in vegetation patterns and increases in wildfire size and frequency (Franco 2005).

Response to Climate Change: The Wash Plan conservation strategy protects and enhances through restoration and management the habitat connectivity of the region. Protection of habitat connectivity, especially along ecological gradients such as elevational gradients and along natural hydrologic features, provide the opportunity for species to shift their range and area of occupied habitat in response to climate change. Additional adaptive management may be needed to enhance connectivity at key locations, or to translocate individuals across existing barriers to movement.

Fire

A repetitive fire that results in or substantially increases the risk of type conversion (e.g., converting shrublands to nonnative grasslands) constitutes a changed circumstance. The USFWS has indicated that for sage scrub and riparian habitat, repeat fires within the same footprint within 10 years of the original burn can adversely hamper natural regrowth and interrupt the ability of the habitat to rejuvenate. Diffendorfer et al. (2007) cite several sources that indicate fire cycles of one to three years within sage scrub can increase the presence of exotic weeds and lead to conversion to grassland. Ten years after a fire, shrub dominated habitat types are expected to be fully re-established and capable of natural regeneration.

Based on the frequency, extent, and severity of damage from a repetitive fire, specific adaptive management tasks will be identified and implemented. Natural regrowth within the damaged area will be monitored and measures to control invasion of exotic plant species, excessive erosion, and and/or type conversion will be applied as part of AMMP implementation.

Drought

For the purpose of defining Changed Circumstances, drought is defined as climatic drought of 5 to 10 years in length, as declared by the California State Department of Water Resources and/or the SBVWCD. Longer periods of drought are considered unforeseen circumstances.

Depending upon the extent and severity of the drought, a specific adaptive management action plan will be developed and implemented. Management activities may include controlling non-native weeds and other invasive species as part of AMMP implementation.

Flood

A 100-year flood event as classified by the Federal Emergency Management Agency (FEMA) and determined by the SBCFCD constitutes a changed circumstance under this HCP. However, flooding is a natural event and is not anticipated to cause sufficiently severe damage that would prevent natural regeneration within the preserve. If the extent and severity of flood damage indicate a need for monitoring or management, measures will be identified and applied as part of AMMP implementation.

Invasion of Exotic Species

For the purpose of defining Changed Circumstances, invasion of invasive exotic species is defined as an introduction of a species within conserved habitat that has either: (a) not previously been known to occur in the Plan Area and has been noxious elsewhere; or (b) is a particularly noxious variety of non-native species that is resistant to typical control measures. Unforeseen circumstances would be defined as invasion within a preserve of a species not currently known to be a noxious elsewhere, but that becomes so upon introduction to the preserve.

When invasive species are discovered, actions designed to reduce such species will be applied. If an unanticipated invasion by exotic species occurs as a result of another Changed Circumstance identified in this section (e.g., repeated fires), USFWS will be notified. The damage caused by the unanticipated invasion by exotic species will be addressed as follows: The invasive species will be mapped and their abundance at each location will be noted;

- Actions to improve habitat conditions and reduce the threat(s) will be implemented;
- The response of species/habitats to the action(s) taken will be monitored.

If the influx of invasive species involves a species included on the California Invasive Plant Council (CalIPC) "List A" or state or federal "noxious" weeds, USFWS and CDFW will be notified and a plan of action will be determined within 30 days of such notice.

Future Listings of Non-Covered Species

In the event that a species that is not a covered species under this HCP is listed by the USFWS subsequent to the issuance of the ITP, such listing will be considered a Changed Circumstance. Appropriate action to avoid take of the newly listed species or to add the species to the HCP and ITP through the amendment process will be taken.

Failure of Spineflower Enhancement and Relocation Program

Failure of the Spineflower Relocation and Enhancement Program will be considered a Changed Circumstance. Criteria for determining what would constitute failure of the Spineflower program will be identified in the detailed plans for the program. Actions to reduce take or provide for additional management of known populations will be considered.

6.4 Responses to Unforeseen Circumstances

Unforeseen circumstances are defined in 50 CFR 17.3 as changes in circumstances that affect a species or geographic area covered by the HCP that could not reasonably be anticipated by the permittee or USFWS at the time of the HCP's negotiation and development and that result in a substantial and adverse change in status of the covered species. The purpose of the No Surprises Rule is to provide assurances to non-Federal landowners participating in habitat conservation planning under the ESA that no additional land restrictions or financial compensation will be required for species adequately covered by a properly implemented HCP, in light of unforeseen circumstances, without the consent of the permittee.

In case of an unforeseen event, SBVWCD shall immediately notify USFWS staff who have functioned as the principal contacts for the proposed action. In determining whether such an event constitutes an unforeseen circumstance, USFWS shall consider, but not be limited to, the following factors: size of the current range of the affected species; percentage of range adversely affected by the Wash Plan HCP; percentage of range conserved by the Wash Plan HCP; ecological significance of that portion of the range affected by the Wash Plan HCP; level of knowledge about the affected species and the degree of specificity of the species' conservation program under the Wash Plan HCP; and whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected species in the wild.

If USFWS determines that additional conservation and mitigation measures are necessary to respond to the unforeseen circumstances where the Wash Plan HCP is being properly implemented, the additional measures required of the SBVWCD must be as close as possible to the terms of the original Wash Plan HCP and must be limited to modifications within any conserved habitat area or to adjustments within lands or waters that already set-aside in the Wash Plan HCP's operating conservation program. Additional conservation and mitigation measures shall not involve the commitment of additional land or financial compensation or restrictions on the use of land or other natural resources otherwise available for use by covered activities under original terms of the Wash Plan HCP, unless agree to by SBVWCD.

6.5 HCP Amendment Process

6.5.1 Minor Amendments

Minor amendments are changes that would not appreciable affect the Wash Plan HCP's impacts associated with covered activities, implementation of the conservation strategy, or amount of take. A minor amendment is not appropriate to add a new species to be covered under the plan, or to

change significantly the boundaries of the HCP. Examples of minor amendments include correction of spelling errors or minor corrections in boundary descriptions. The minor amendment process would be accomplished through an exchange of letters between SBVWCD holder and the USFWS Field Office.

6.5.2 Major Amendments

Major amendments to the Wash Plan HCP would also require an amendment to the permit. Major amendments involve changes that do affect the amount of impact from covered activities, implementation of the conservation strategy, or increase in the amount of take. A major amendment is required to add new species, or to change significantly the boundaries of the HCP. Major amendments often require amendments to the USFWS decision documents, including the NEPA document, the biological opinion, and findings and recommendations document. Major amendments will often require additional public review and comment.

6.5.3 Suspension/Revocation

USFWS may suspend or revoke their respective permits if SBVWCD fails to implement the Wash Plan HCP in accordance with the terms and conditions of the permits or if suspension or revocation is otherwise required by law. Suspension or revocation of the Section 10(a)(1)(B) permit, in whole or in part, by USFWS shall be in accordance with 50 CFR 13.27-29, 17.32 (b)(8).

6.5.4 Permit Renewal

Upon expiration, the Section 10(a)(1)(B) permit may be renewed without the issuance of a new permit, provided that the biological circumstances and other pertinent factors affecting covered species are not significantly different than those described in the original Wash Plan HCP. To renew the permit, SBVWCD shall submit to USFWS, in writing:

- a request to renew the permit; reference to the original permit number;
- certification that all statements and information provided in the original Wash Plan HCP and permit application, together with any approved HCP amendments, are still true and correct, and inclusion of a list of changes;
- description of all take that has occurred under the existing permit; and
- a description of any portions of covered activities still to be completed.

If USFWS concurs with the information provided in the request, it shall renew the permit consistent with permit renewal procedures required by Federal regulation (50 CFR 13.22). If SBVWCD files a renewal request and the request is on file with the issuing USFWS office at least 30 days prior to the permits expiration, the permit shall remain valid while the renewal is being processed, provided the existing permit is renewable. However, SBVWCD may not take listed species beyond the quantity authorized by the original permit or change the scope of the Wash Plan HCP. If SBVWCD fails to file a renewal request within 30 days prior to permit expiration, the permit shall become invalid upon expiration. SBVWCD must have complied with all annual reporting requirements to qualify for a permit renewal.

6.6 Institutional Structure

Implementation of the Wash Plan HCP will proceed under the following institutional and administrative arrangements:

1. Consistent with its role as the entity responsible for coordinating implementation of the Wash Plan, the SBVWCD shall be the Program Administrator for HCP implementation and shall administer the Section 10(a)(1)(B) permit and Section 7 incidental take authorization.
2. In its capacity as Program Administrator, the SBVWCD shall provide for an HCP Implementation Team to administer the HCP. The HCP Implementation Team shall consist of an Executive Director, Habitat Conservation Program Manager, Biological Consultants, and a Wash Plan Advisory Committee.
 - a. The General Manager for the SBVWCD shall serve as the Executive Director, and will be responsible for overall administration of the HCP program, including preparation of the annual budget, submittal of annual reports to USFWS and CDFW, maintenance of all program records, and serve as chairperson of the Advisory Committee. The Executive Director will ensure that there is full compliance by all parties covered by the 10a Permit with the terms and conditions of the ITP.
 - b. The Habitat Conservation Program Manager shall be responsible for overseeing development and implementation of the management programs for conserved habitat, preparation of annual reports, consultation with the USFWS and CDFW as needed, preparation of annual work programs and the completion of implementation actions in fulfillment of HCP commitments. The Program Manager will oversee any and all consultant work performed to implement the HCP programs.
 - c. Biological Consultants shall be retained to provide required technical assistance in the development and implementation of the adaptive management and monitoring programs and compliance with habitat management measures, species surveys and other biological oriented activities.
 - d. The Wash Plan Advisory Committee shall include representatives of the covered parties and one at-large member. The USFWS, CDFW, BLM, and a WSPA Management Committee representative will participate as ad hoc members. The Committee will provide advice to the SBVWCD on HCP activities.
3. With regard to the authorizations for incidental take, the SBVWCD shall be the permittee for the ITP and non-federal project proponent for the Section 7 take authorization statement. Take associated with Section 7 authorizations involve Wash Plan activities on federal land administered by the BLM. These activities consist of: a) construction of Phase III water conservation facilities, b) modifications to "D-Dike" for SBKR corridor movement and c) in cooperation with the cities, establishing hiking/interpretive trails within existing disturbed alignments. The authorization for incidental take would be conditioned on preservation of the proposed Newly Conserved Lands under conservation easements or comparable arrangements, execution of an agreement between the SBVWCD and BLM and other entities as needed regarding the Additionally Managed Lands, and ensuring compliance with permit terms and conditions by each covered party.

4. All covered parties (i.e., all entities covered by the authorizations for incidental take) will be required to notify the SBVWCD of specific activities covered by the ITP and Section 7 take authorizations prior to performing ground disturbing work. Covered parties will provide a certification with the terms and conditions of the ITP attesting to the party's performance in compliance with ITP requirements. Covered parties will identify the lands where the impacts will occur, the required impact avoidance and minimization measures, the process by which the measures will be implemented, and post-impact monitoring requirements. The information on the certification will be reviewed for conformance with the approved HCP by the Executive Director. Certifications will be included in the annual reports submitted to the USFWS and CDFW.
5. Implementation of the HCP will be overseen by the Wash Plan Advisory Committee. All meetings of the Advisory Committee shall be open to the public.
6. USFWS, CDFW, and BLM shall provide technical advice to the HCP Implementation Team and HCP Advisory Committee and shall participate in meeting discussions and program review.
7. Time deadlines for review periods, responses to required consultations, and coordination of activities are established in the HCP and will be reiterated in the IA.
8. Implementation of the HCP will be planned and conducted under annual and five-year work plans prepared by the Executive Director with the assistance of the Habitat Conservation Program Manager and approved by the Advisory Committee and the SBVWCD's Board of Directors. The five-year work plans will identify administrative, management, monitoring, and other tasks required during the period, cost estimates for the work in each year, and funding projections for the period. The annual work plans will specify tasks for the year and a line-item budget. The first five-year plan will be adopted within two years of plan and ITP approval. Annual work plans will guide implementation on a yearly basis. Thereafter, the five-year work plan will be updated every three years. The schedule for approval of the annual and five-year work plans shall coincide with the SBVWCD's adoption of its annual work program and budget.

7.1 Funding Requirements, Sources, and Assurances

This chapter provides planning-level estimates of the costs to implement the Wash Plan HCP, identifies funding sources to pay for implementation, and describes the rationale for funding assurances. The general cost analysis was based on a number of assumptions regarding the timing of implementation of various components of the HCP and the estimated unit cost of labor and materials. Unit cost estimates were based on the best available information and represent average unit costs. The costs of individual items will fluctuate above and below these averages. The total cost presented herein should therefore be regarded as a planning-level estimate to aid in the determination of the eventual amount of funding likely to be necessary to implement the Plan.

7.1.1 Implementation Costs

There are three implementation areas of an HCP that requiring funding assurances for direct and indirect costs: 1) land acquisition; 2) habitat management, and; 3) monitoring and reporting. Financial assurances are important for the ongoing activities during the 30 year permit duration, but also critical is a non-wasting endowment to fund management activities in perpetuity. Examining these three areas in more detail for the Wash Plan HCP indicate a focus on endowment development is critical.

Land Acquisition Costs and Assurances

The majority of the 1925 [Check] acres conserved as part of this plan are in public ownership and all of the land is owned by members of the Wash Plan Task Force. Nominal estimates of \$25,000 per acre, place the value of the land contributed to the plan at \$48 Million. The lands placed into conservation are primarily owned by the San Bernardino Valley Water Conservation District, with additional holdings by the BLM, San Bernardino County Flood Control District and the City of Redlands. Appropriate assurances of long-term conservation will be provided within the first five years of the plan implementation, either through conservation easements or other agreement acceptable to the resource agencies. With the exception of flood control lands, the bulk of these lands will be placed in conservation within five years of permit issuance. In some cases, where habitat impacts take place in a “rough step” later during the permit duration, lands will be placed under a conservation easement or another habitat protection vehicle prior to the “rough step” covered activity receiving take authority. This process is primarily intended to cover mining activities where the ground disturbance associated with mining occurs over the entire 30 year permit duration. While this could apply to any project, most of the other covered activities and their species impacts primarily occur within the first five years of the incidental take permit. These activities are followed with O & M activities associated with these newly constructed facilities.

San Bernardino County Flood Control has placed land in excess of what is needed for mitigation of the County's similar impacts within the plan area. They will provide mutually acceptable assurances to the resource agencies that lands will be conserved to mitigate for impacts to listed species from flood and maintenance activities through one or more conservation easements or other mutually-agreed upon mechanism for all listed construction and maintenance impacts prior to their occurrence. Additional lands will be placed into conserved status based on the needs of the Wash Plan agencies which will occur before any impact or modification to habitat occurs. This tracking system will demonstrate to agencies with covered activities, the resource agencies and the public that all lands are clearly identified as reserved for conservation purposes. This tracking system and how it will be implemented will be described in detail in the Implementing Agreement.

The BLM normally does not place easements or other restrictions on lands they hold. However, lands slated for additional management as conservation lands are listed as Areas of Critical Environmental Concern (ACEC), a conservation ecology program in the western United States, managed by the BLM as part of the 1976 Federal Lands Policy and Management Act (FLPMA). Through FLPMA, BLM is directed to protect important riparian corridors, threatened and endangered species habitats, cultural and archeological resources and unique scenic landscapes that the agency assesses as in need of special management attention by designation as ACEC. Clearly, the lands owned by BLM and slated for additional management activities have the intent of Congress for protection in perpetuity. The ACEC program was conceived in which established the first conservation ecology mandate for the BLM.

This protection is similar to land protections afforded in the Coachella Valley MSHCP where BLM ACEC lands were considered to be level two lands where land is maintained to protect its current natural land values, but some existing activities, such as water conservation may occur. In this scenario, the only higher level of protection provided by BLM, level one, indicates Wilderness Areas declared by legislative action. If needed for BLM lands, the HCP may include additional agreements to provide assurance to the resource agencies.

Land Stewardship and Habitat Management Costs

General Land Stewardship Costs

Habitat management can be viewed as the sum of two activities: 1) the general land management required to maintain a property in its current state (i.e., basic land stewardship), and; 2) activities and actions related to the management of habitat for listed and other covered species through the Wash Plan HCP.

General land management activities include:

- trash removal,
- minimization and clean-up of illegal dumping,
- restricting unauthorized access ,
- and maintenance of facilities and equipment needed for habitat management.

Unauthorized access and illegal dumping will be additionally addressed through city or County law enforcement and through a reimbursement agreement with BLM for the patrol services of Peace Officer Standards Training (POST) certified rangers. It is anticipated that adequate patrol would consist of alternating weekend days when illegal activity is most likely. This patrol service is estimated to cost approximately \$40,000/ year in current dollars.

Habitat Management Costs

In addition to general land management activities, specific actions intended to improve habitat conditions and to expand suitable habitat for covered species have been documented in the Wash Plan HCP. An annual workplan will be prepared for specific habitat management actions and prescriptions by the Wash Plan Habitat Management Committee. The Committee shall consist at a minimum of a representative from the USFWS, the CADFW, and the SBVWCD. The annual workplan will focus habitat management efforts on areas adjacent to existing high quality habitat locations and corridors providing connectivity with other habitat areas.

Development of the annual workplan will use:

1. HCP prescriptions for species covered in the wash plan;
2. data collected during monitoring and reporting activities;
3. a GIS-based treatment plan developed for the HCP and updated as additional information becomes available;
4. funds available for habitat management activities, and
5. additional site specific information collected over the previous year, including wildfire and other unanticipated impacts.

Both general land management and habitat management activities will be accomplished through the use of current and additional SBVWCD staff and contractors. The SBVWCD has adequate space available for administrative and field and shop maintenance activities, including large equipment storage and repair in existing facilities used for Operations and Maintenance of SBVWCD recharge facilities. It is estimated that the annual cost of providing general and specific land management is \$200,000 a year.

Because woollystar habitat management and population enhancement was specifically identified as critical for the success of the Wash Plan HCP, each annual workplan will identify actions specific to woollystar and the Habitat Management Committee will cooperatively endeavor to obtain additional funding to conduct research on this species through specific grants or other funding mechanisms.

The annual workplan will provide a mechanism to track habitat enhancement beyond what is required in this plan. Activities that go beyond what is required for the mitigation of covered activities and would allow the resource agencies to direct additional mitigation for other projects or activities on to the Wash Plan lands. These additional activities will be tracked and reported separately and would benefit covered or other important species. If the additional activities benefit a species not considered a covered species in the Wash Plan HCP it is understood that act benefiting other species cannot impact covered species and all proposed additional actions require approval by resource agencies.

Trail Management Costs

The Wash Plan HCP provides only take authorization of covered species and mitigation measures for the operations and maintenance of the documented trail system within the Wash Plan boundary. Development and maintenance of staging areas are planned for areas outside the Wash Plan boundaries and are as such not considered here. Incidental Take approval for the trail system is considered permissive. It is conditioned because it depends on the formal approval of a trail plan by the resource agencies. This plan must include the activities and measures undertaken to avoid, minimize or mitigate impacts associated with the operation of the trail system. Some minimization or mitigation activities will require specific additional maintenance, such as trash can placement, additional patrols provided either by volunteers or paid rangers, and placement and repair of signage. These costs are not considered here and are the responsibility of those operating the trail system. It is expected that members of the Wash Plan Task Force will cooperate to provide and meet the requirements for the trail system.

Monitoring and Reporting Costs

A comprehensive annual report of activities undertaken as part of the annual workplan, including all required work, unplanned work, enhancement and land commitment tracking will be provided to the Habitat Management Committee to demonstrate progress and inform the process of preparing the next annual workplan. Both the annual report and workplan will be presented for consideration of approval by the SBVWCD and will be provided to all participating Task Force entities for comment prior to approval.

The Species covered in the Wash Plan HCP will be monitored regularly as indicated in the annual workplan; however it is not necessary to provide monitoring data annually for every species. It should be noted that during the initial five years of the Wash Plan permit spine flower will continue to be monitored annually as the SBVWCD has done for several years. Where protocols exist for species monitoring, those protocols should be used by qualified biologists. In other cases, an acceptable sampling protocol will be developed and approved as part of the development of the annual workplan. It is expected that avian species be monitored by qualified ornithologists using standard methods every 2-3 years and San Bernardino kangaroo rat be monitored every 3-5 years. Annual cost of annual workplan preparation and monitoring are estimated to cost \$55,000 per year in current year dollars. Additional costs associated with data preparation and database management and analysis, including the preparation of maps and figures estimated to cost \$15,000 per year in current dollars.

Rough Step Process and Jump Start

As described above some covered activities such as mining occur in various Rough Steps throughout the duration of the HCP implementation. However, many of the construction activities and most of the maintenance activities occur in the earliest phase of Wash Plan HCP implementation. Because of this it is important that adequate conservation activities occurring early in HCP implementation to mitigate these early impacts. The Wash Plan HCP implementation will provide a “jump start” on mitigation efforts to ensure that sufficient mitigation occurs in these early years. Jump Start activities provide for 200 acres of focused management to take place in the first two years of

implementation. These activities focus on: 1) controlling invasive vegetation, primarily grasses, in areas known to support spineflower and 2) enhancing the quality of the important biological corridor by thinning or controlling invasive vegetation along the corridor margins. These activities are estimated to cost \$125,000 per year for only the first two years.

Addition impacts associated with mining would occur in increments or “rough steps” at approximately five year intervals. Prior to the rough step covered activity the associated rough step mitigation activity will be completed so that mitigation is in advance of the initiation of the covered activity.

Endowment Management

It is expected that during the duration of the HCP, not only will the ongoing costs of the program be covered by the participants, but that an endowment will be developed to fund the costs of management, monitoring and administration in perpetuity. The amount of the endowment will be determined by the PAR process and will account for “rough step” contributions as covered activities are initiated.

It is anticipated that during the Wash Plan HCP permit duration that funding will be provided by a combination of endowment funds and operating funds provided by members of the Wash Plan Task Force. The Implementation Agreement (IA) will detail financial obligations of the parties and will provide assurances that adequate funding will be provided. Construction or permanent impact covered activities will pay their allocated mitigation amount to the District to be contributed to the Endowment six months prior to the planned initiation of ground disturbing activities.

It is expected that some operations and maintenance activities will fund the cost of their share of annual activities plus endowment contribution on an annual basis. This annual payment will begin 12 months after initiation of HCP implementation. All covered activities will participate in the Jump Start funding. If an entity who only has operations and maintenance activities elects to pay annually, their Jumps Start amount will include the prepayment of 2 years of annual contributions. Annual payments will always be paid in full at least a minimum of 12 months in advance of the beginning of the current year. If not paid after notice, the Incidental Take Authority will be revoked and the resource agencies notified.

The endowment shall be managed in a prudent manner to provide ongoing operating funding to implement the Annual Workplan.

Should the endowment not generate sufficient funds to implement the annual workplan, the Wash Plan Task Force will consult with the resource agencies and develop modifications to the Wash Plan HCP.

7.1.2 Funding Sources

The cost of plan implementation will be shared by the covered parties, based on the formula identified in the IA. In addition, the HCP Implementation Team will seek monitoring and research grants from government, non-profit, and private sources.

7.1.3 Funding Assurances

As an assurance that adequate funding is available for plan implementation, the covered parties will establish and maintain a fund adequate to cover the first five-years of program implementation. Based on the estimated costs, the initial fund will be approximately \$X.X million.

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Chapter 8

Alternatives Considered

As part of the development of this HCP, multiple alternatives were considered regarding ways to avoid take of listed species and other conservation strategies. The primary alternatives considered and the reasons why each alternative was not selected are as follows.

8.1 Complete Avoidance of Take

Under this alternative, activities in the Wash Plan Area would be conducted to avoid take of SBKR, Gnatcatcher, Woollystar, and Spineflower. Because of the broad distribution of SBKR and Woollystar, complete avoidance of take of all listed species would require substantial changes to existing and future O&M activities and to the design and implementation of planned projects in the Wash by all of the proposed covered parties. The impracticality of this alternative was the trigger for preparation of the Wash Plan as well as this HCP. The alternative was rejected in favor of reconciling land use and species/habitat conservation goals for the Wash and seeking authorization for incidental take.

8.2 No Take of Spineflower

Of the four proposed covered species, Spineflower is the most at risk. The Plan Area is one of only eight remaining locations for this narrow endemic plant species and one of only two locations in San Bernardino County. Further, the cryptic nature of this plant and limitations on what is known about why it occurs in certain areas make it difficult to plan for its conservation or to identify effective mitigation for impacts. Excluding Spineflower from the list of species covered by the plan and authorizations for take was considered in the early stages of HCP preparation but was rejected in favor of the approach developed in cooperation with USFWS and CDFW. That approach conditions take of Spineflower on the successful development of a relocation and habitat enhancement program for Spineflower in the Wash as part of HCP implementation. Because of the known and potential occurrence of Spineflower on lands that would be managed under the HCP, development of the relocation and enhancement program has the potential to directly contribute to the recovery of this species. In that context, a limited amount of incidental take could occur without posing jeopardy to the species.

8.3 Reduced Take of SBKR and Woollystar

Under this alternative, impacts to SBKR and Woollystar would be reduced either by setting a limit on the acres of habitat or number of individuals taken or by limiting the size and location of the areas where take could occur in connection with mining and the SBVWCD's proposed water conservation projects (the two Covered Activities that would entail substantial impacts to both species). Limits on the size and locations of impact areas were considered in detail in the Wash Plan EIR, which analyzed a reduced mining area impact area, alternate locations for mining operations, and

alternate plans for the water conservation projects. These options were rejected in favor of increasing the amount of conservation in proportion to take and creating a Wash-wide preserve system for these species by adding conserved lands in areas adjacent to the WSPA.

8.4 Comprehensive Multiple Species Conservation Program

Under this alternative, an NCCP or other comprehensive multiple species conservation program would be prepared and implemented for the Plan Area instead of the HCP for the four listed species. This approach was considered at several stages in the planning process, and a preliminary draft of a multiple species HCP was prepared while the Wash Plan was being completed. The decision to focus on the four listed species was a matter of expediting implementation of the Wash Plan rather than a rejection of a multiple species conservation strategy. Nothing in the HCP for the four species precludes a multiple species program for the Wash. Further, implementation of the HCP will be coordinated with the Wash Plan HEP and the USACE's proposed MHMP for the WSPA.

Chapter 9

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Chapter 11

Glossary

Adaptive Management – A decision process that promotes flexible decision making, which can be adjusted in the face of uncertainties as outcomes from management actions and other events are better understood. Careful monitoring of these outcomes advances scientific understanding and allows for the adjustment of policies and/or operations as part of an interactive learning process. Adaptive management also recognizes the importance of natural variability in contributing to ecological resilience and productivity.

California Environmental Quality Act – California Public Resources Code 21000 21177 et seq., including all regulations promulgated pursuant to that Act.

California Endangered Species Act – California Fish and Game Code section 2050 et seq., including all regulations promulgated pursuant to that Act. CESA prohibits CDFW from authorizing any Incidental Take of a state-listed threatened or endangered species if that take would jeopardize the continued existence of the species; all impacts to state-listed species must be fully mitigated.

Changed Circumstances – Changes affecting a species or geographic area covered by the Plan that can reasonably be anticipated and planned for by Plan developers and the USFWS.

Clearing – The removal of natural vegetation by any means, including brushing and grubbing.

Conserve – To protect land for its natural resource values.

Corridor – A specific route that is used for movement and migration of species. A corridor may be different from a linkage because it represents a smaller or narrower avenue for movement.

Covered Activities – activities in the Plan Area undertaken by the plan participants and covered by the authorizations for incidental take.

Covered Species – Those species within the HCP that will be adequately conserved through implementation of the HCP.

Developed Land – Land that has been constructed upon or otherwise covered with a permanent or semi-permanent unnatural surface shall be considered developed (Holland 12000). Regardless of substrate, areas covered by a large amount of debris or other materials may also be considered developed.

Disturbed Land – Land which has been significantly modified by previous legally authorized human activity, but continues to retain a soil substrate shall be considered disturbed land (Holland Code 11300). This shall include areas that have been graded, repeatedly cleared for fuel management purposes, and/or experienced recurring use resulting in compacted soils and minimal potential for natural revegetation (i.e., dirt parking lots, incised trails, etc.).

Edge Effects – Indirect impacts to a preserve area caused by development adjacent to the preserve area. Indirect impacts can be temporary and/or permanent, such as: drainage, invasive species, lighting, brush management, trails, contour grading and construction/operational noise.

Emergency – An event or situation that poses considerable risk to human health and safety. This includes, but is not strictly limited to, loss of human life, property damage, or air and water contamination threatening human health and safety.

Endangered Species – A species listed as endangered under the federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA).

Endangered Species Act – The federal Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 et seq.), including all regulations promulgated pursuant to that Act.

Fully Protected Species – Those species listed in Sections 3511 (Fully Protected Birds), 4700 (Fully Protected Mammals), 5050 (Fully Protected Reptiles and Amphibians), and 5515 (Fully Protected Fish) of the California Fish and Game Code that may not be taken or possessed at any time and for which no licenses or permits may be issued for their Take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock.

Grading - Any excavating or filling or combination thereof, including the land in its excavated or filled condition according to the County's Grading Ordinance.

Grubbing – The removal of natural vegetation by any means, including removal of the root system.

Incidental Take Permit – The permit granting take of listed species provided such take is incidental to and not the purpose of the carrying out of an otherwise lawful activity. For purposes of the section 10(a)(1)(B) permit, Incidental Take refers solely to species other than plant species.

Linkage – An area of land which supports or contributes to the long-term movement of wildlife and genetic exchange by providing live-in habitat that connects to other habitat areas, including agricultural lands that contribute to wildlife movement.

Migratory Bird Treaty Act – The federal Migratory Bird Treaty Act (16 U.S.C. § 701 et seq.), including all regulations promulgated pursuant to that Act.

Non-native Grassland – Land which supports non-native grassland (Holland 42200) as generally indicated by the presence of *Avena*, *Bromus*, *Erodium*, *Brassica*, and other annual species.

Plan Area – the lands covered by the HCP and its authorizations and requirements.

Population – An interbreeding group of individuals of the same species. The geographical limits of a population should be delineated as most appropriate for that species depending on its mobility, method of reproduction, and known distribution. Portions of a population shall generally be determined based on the number of individuals; however, area may be appropriate for some species.

Rare Species – A species that exists in such small numbers throughout all or a significant portion of its range that it may become endangered or threatened, as defined by CESA or ESA, if factors affecting its survival worsen.

Section 10(a)(1)(B) Permit – A permit issued by the USFWS under section 10(a)(1)(B) of the ESA (16 U.S.C. § 1539(a)(1)(B)) to allow the Incidental Take of Species Adequately Conserved and/or Covered Species, to the extent Take of such species is otherwise prohibited under section 9 of the ESA. The Take of listed plant species is not prohibited under the ESA or authorized under a section 10(a)(1)(B) permit. However, plant species adequately conserved by this Plan are listed in the 10(a)(1)(B) permit in recognition of the conservation measures and benefits provided for them under the Plan and receive assurances pursuant to the USFWS “No Surprises” Rule.

Section 1600 – Section 1600 of the California Fish and Game Code, which regulates alterations to permanent or intermittent stream courses.

Section 4(d) Special Rule – The regulation concerning the California gnatcatcher published by the USFWS on December 10, 1993 (58 Fed. Reg. 65088) and codified at 50 C.F.R. section 17.41(b) pursuant to the ESA which describes one particular set of conditions under which the Incidental Take of the California gnatcatcher in the course of certain land use activities is lawful.

Section 7 – Section 7(a)(2) of the ESA (16 U.S.C. § 1536 (a)(2)) which requires that any federal agency that permits, licenses, funds, or otherwise authorizes activities that may affect species listed under the ESA consult with the USFWS to ensure that its actions will not jeopardize the continued existence of any listed species or adversely modify the designated critical habitat of a listed species.

Sensitive Species – Species which meet any of the following criteria: (1) those species that are included on generally accepted and documented lists of plants and animals of endangered, threatened, candidate, or of special concern by the federal government or State of California; (2) narrow endemic species or sensitive plant species (as defined herein); or (3) those species that meet the definition of “rare or endangered species” under section 15380 of the CEQA Guidelines.

Suitable habitat - An area that meets the habitat needs of a species and is likely to be utilized by that species at some point within a 5-year period. If an area appears to contain the appropriate elements for a species and is within dispersal distance of known populations and without substantial barriers, it should be considered suitable unless demonstrated otherwise through appropriate and adequate field surveys.

Take – Refers to the meaning provided by the ESA and the California Fish and Game Code, including relevant regulations and case law. Under the ESA, “take” is defined as to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct (16 U.S.C. § 1532(19)) and “harm” has been further defined to “include any act which actually kills or injures fish or wildlife” including “significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife (40 Fed. Reg. 44412 and 46 Fed. Reg. 54748).

Take Authorization – Permit authority granted through a section 10(a)(1)(B) permit pursuant to the ESA, a section 2081 permit granted pursuant to CESA, or a section 2835 permit pursuant to the NCCPA.

Threatened Species – A species listed as “threatened” under the ESA or CESA that is likely to become endangered in the foreseeable future.

Unforeseen Circumstances – Changes in circumstances affecting a species or geographic area covered by the Plan that could not reasonably have been anticipated by Plan developers or the USFWS at the time of the Plan's negotiation and development, which result in a substantial and adverse change in the status of the Covered Species.

Viable – Capable of maintaining normal ecosystem functions over the long term that sustain a full suite of native or naturalized species without intensive direct human intervention.



Passion. Expertise. **Results.**