



UPPER SAR HCP

UPPER SANTA ANA RIVER HABITAT CONSERVATION PLAN

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STAKEHOLDER DRAFT

Prepared for:
San Bernardino Valley
Municipal Water District
380 East Vanderbilt Way
San Bernardino, CA 92408

Prepared by:
ICF
525 B Street, Suite 1700
San Diego, CA 92101



Executive Summary

ES.1 Overview of the Habitat Conservation Plan

The Upper Santa Ana River (SAR) watershed is home to dozens of water districts, flood control districts, and other local water management agencies (collectively and generally referred to as *water agencies*) with an interest in the responsible management of water supply resources (e.g., storage, conveyance, treatment, flood protection, and recreation) and sustainable stewardship (e.g., water quality and biological resource protection) of the watershed. The challenges facing water districts and other local agencies in the Upper SAR include the effects of population growth that increase water demand and decrease natural hydrological processes and groundwater recharge, the reduction of imported water availability, and the effects of climate change. As a result of these pressures of urbanization, many of the species in the Upper SAR watershed are listed as threatened or endangered under the California and federal Endangered Species Acts (CESA and FESA, respectively). Therefore, many water agency activities potentially impacting these species, such as the Santa Ana sucker and San Bernardino kangaroo rat (see Section ES.3, *Covered Species*, below), may require permits from the United States Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) (collectively referred to as the *Wildlife Agencies*).

The Upper SAR Habitat Conservation Plan (HCP) has been developed to address the potential effects of water agency activities on the sensitive species and habitats in the watershed in order to receive Incidental Take Permits (ITPs) under Section 10 of FESA.

ES.1.1 Purpose of the Habitat Conservation Plan

The Upper SAR HCP is a regional, comprehensive program that would provide a framework to protect, enhance, and restore the habitat for Covered Species (Chapter 3, *Planning Area and Existing Environment*), while streamlining permitting for Covered Activities (Chapter 2). Within this framework, the Upper SAR HCP would achieve conservation goals and objectives and comply with FESA while streamlining planning and permitting for anticipated water resource management projects needed to serve the water resource needs of the public. The HCP will achieve the conservation goals and objectives through the establishment of the HCP Preserve System and implementation of the conservation actions as described in Chapter 5, *Conservation Strategy*, of this HCP.

ES.1.2 Cost and Benefit of the Habitat Conservation Plan

The HCP is estimated to cost approximately \$187.5 million, paid incrementally over the 50-year permit term and excluding inflation, and shared among the water agencies receiving ITPs under this HCP (see Section ES.2, *Incidental Take Permits*, below).

Over 50 years, the \$187.5 million in HCP costs will allow Permittee Agencies to develop over 4 million acre-feet of water for local use, or approximately 87,000 acre-feet per year (afy) by year 15 of HCP implementation. These water resources will reduce reliance on costly imports from other parts of the state, increasing the area's resilience to drought and regulatory restrictions that hamper water deliveries from the State Water Project, while also keeping more of the project spending in the local economy.

While there is a high initial investment cost, the economic benefits of the plan to water users and the local economy as a whole are substantially greater than the costs. Without the HCP in place, Permittee Agencies would need to acquire this additional 87,000 afy of water supply from more costly alternative sources. Even if it was possible to purchase that volume of water either from wholesalers or elsewhere in the market, the HCP is projected to save the region approximately \$952 million over the life of the HCP on a net present value basis, and create secondary benefits from investment in the local economy.¹ This represents a benefit-cost ratio of over 7.3,² which illustrates the enormity and importance of this effort. See Chapter 7, *Funding*, for additional information.

ES.1.3 Evolution of the Habitat Conservation Plan

The current set of Covered Activities in the Upper SAR HCP was determined through the partnership and the collaborative efforts with the Permittee Agencies, Wildlife Agencies, and involved stakeholders. The complete HCP conservation strategy for all Covered Species was also developed through this collaborative partnership, and includes a comprehensive strategy for long-term protection, restoration, and conservation to manage the natural resources and species of the Upper SAR watershed in a way that ensures long-term ecological value to the region and species recovery. Through this collaborative partnership, many modifications were made to the HCP to further reduce impacts on the Santa Ana River and increase conservation values to species in a way that protects and enhances the ecological function of the system.

Previous HCP iterations included Covered Activities that resulted in greater impacts on species and the riverine system than were acceptable or likely to be permissible under FESA and CESA. Preliminary impact analyses, including substantial hydrology modeling, led to the modifications to the Covered Activities to substantially reduce the potential biological and hydrological impacts resulting from the Covered Activities. Similarly, many iterations and additions to the conservation strategy led to substantial improvements in the measures to avoid and minimize take and the expected outcomes for each species covered by the HCP. The modifications resulted in reduced impact on the Santa Ana River and increased conservation values to species in a way that protects and enhances the ecological function of the system far more than earlier iterations of the HCP.

ES.2 Incidental Take Permits

ES.2.1 Permittee Agencies

The HCP was collaboratively developed for 11 water agencies with planned water supply or other infrastructure projects needing incidental take permit coverage for endangered and threatened species in the Santa Ana River watershed. These 11 water agencies (Permittee Agencies), together with Southern California Edison (SCE), which may receive its own incidental take permit in accordance with the HCP, comprise the 12 entities that will receive incidental take coverage through

¹ Refer to Section 7.6, *HCP Benefits*, for a detailed accounting of this estimate. Net present value (NPV) calculations are made using an interest rate of 4.61% based on the rate used by the State Water Project in calculating water prices. A general inflation rate is assumed to be 2%. The net discount rate is 2.61%.

² The benefit-cost ratio is the net present value of the benefits divided by the net present value of the costs. In this case, the benefits are the avoided future costs of more expensive water sources. A ratio above 1.0 indicates net positive benefits over the life of a project or program.

the HCP. The 11 water agencies will be issued a single joint ITP. The Permittee Agencies are listed in alphabetical order below.

- City of Rialto Public Works
- East Valley Water District
- Inland Empire Utilities Agency
- Metropolitan Water District of Southern California
- Orange County Water District
- Riverside Public Utilities
- San Bernardino Municipal Water Department
- San Bernardino Valley Municipal Water District
- San Bernardino Valley Water Conservation District
- West Valley Water District
- Western Municipal Water District of Riverside County

Southern California Edison Incidental Take Permit

A second ITP is expected to be issued to SCE to provide incidental take coverage for any Santa Ana suckers that may be translocated to waters covered by their licenses from the Federal Energy Regulatory Commission (FERC).

ES.2.2 Habitat Conservation Plan Planning Area and Permit Area

The Planning Area encompasses approximately 862,966 acres and was developed to ensure that the natural resources that might be affected by Covered Activities can be adequately assessed at a regional scale and that sufficient mitigation opportunities are available. The Permit Area is the geographic area where the impacts of the Covered Activities are expected to occur and is depicted as the ownership, easements, and areas of operation and maintenance where all Covered Activities are located within natural habitats. The Permit Area also includes the HCP Preserve System so that the ITPs cover the potential take associated with habitat mitigation, management, and monitoring. The Planning Area and Permit Area are shown on Figures 1-2 and 1-3 in Chapter 1, *Introduction and Background*.

ES.2.3 Permit Term

The Permittee Agencies are seeking a 50-year ITP, which would accommodate the expected schedule for construction of projects in the Permit Area and ongoing associated operations and maintenance. The permit term for the ITP for SCE will be independent of that of the Permittee Agencies' ITP. SCE operates and maintains hydroelectric facilities in accordance with three, 30-year licenses issued by the FERC in 2003, and the SCE ITP permit term may be established to coincide with the FERC relicensing cycles.

ES.3 Covered Species

There are 20 species covered by the HCP, including 9 listed and 11 non-listed species. There are also two additional Fully Avoided species that are listed but are not Covered Species and will be fully avoided during Covered Activities (Table ES-1). The avoidance and minimization measures included in Chapter 5 are expected to reduce any adverse effects on these species so that they would not result in take.

The incidental take authorization under Section 10 of FESA will apply to the wildlife species. The take of listed plant species is not prohibited under FESA or authorized under a Section 10(a)(1)(B) permit. However, the two plant species conserved by this HCP are listed in the 10(a)(1)(B) permit in recognition of the conservation measures and benefits provided for them under the HCP such that the Permittee Agencies will receive assurances pursuant to the USFWS “No Surprises” rule. Similarly, the unlisted species covered in the HCP will also receive assurances under the “No Surprises” rule should they become listed in the future. Federal authorization for incidental take of other species may be sought through the amendment process and in accordance with FESA Sections 10(a) and 7 (Table 1-1).

As noted above, this HCP establishes conservation strategies for a number of state-listed species. Although CDFW will not approve the HCP, the conservation strategies established for the HCP are intended to also support the issuance of state ITPs.

Table ES-1. Species Addressed in the Upper SAR HCP

Common Name	Scientific Name	Status	
		Federal	State
Covered Species			
Slender-horned spineflower	<i>Dodecahema leptoceras</i>	Endangered	Endangered
Santa Ana River woolly-star	<i>Eriastrum densifolium ssp. sanctorum</i>	Endangered	Endangered
Santa Ana sucker	<i>Catostomus santaanae</i>	Threatened	None
Arroyo chub	<i>Gila Orcuttii</i>	None	SSC
Santa Ana speckled dace	<i>Rhinichthys osculus ssp.</i>	None	SSC
Mountain yellow-legged frog (Southern California DPS)	<i>Rana muscosa</i>	Endangered	Endangered
Western spadefoot	<i>Spea hammondi</i>	None	SSC
California glossy snake	<i>Arizona elegans occidentalis</i>	None	SSC
South coast garter snake	<i>Thamnophis sirtalis sp.</i>	None	SSC
Southwestern pond turtle	<i>Emys pallida</i>	None	SSC
Tricolored blackbird	<i>Agelaius tricolor</i>	None	Threatened
Burrowing owl	<i>Athene cunicularia</i>	None	SSC
Cactus wren	<i>Campylorhynchus brunneicapillus</i>	None	SSC
Yellow-breasted chat	<i>Icteria virens</i>	None	SSC
Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	Threatened	Endangered
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Endangered	Endangered

Common Name	Scientific Name	Status	
		Federal	State
Coastal California gnatcatcher	<i>Poliophtila californica</i>	Threatened	SSC
Least Bell's vireo	<i>Vireo bellii pusillus</i>	Endangered	Endangered
Los Angeles little pocket mouse	<i>Perognathus longimembris brevinasus</i>	None	SSC
San Bernardino Merriam's kangaroo rat	<i>Dipodomys merriami parvus</i>	Endangered	Candidate
Fully Avoided Species ¹			
Delhi Sands flower-loving fly	<i>Rhaphiomida terminatus abdominalis</i>	Endangered	None
Arroyo toad	<i>Anaxyrus californicus</i>	Endangered	None

¹ Implementation of avoidance measures as described in Chapter 5 of this HCP would prevent the take of these species.

DPS = Distinct Population Segment; SSC = CDFW Species of Special Concern.

ES.4 Covered Activities

The Upper SAR HCP must identify the activities that could result in take of Covered Species within the Planning Area. The types of activities covered by the HCP (Covered Activities) should include all actions that the Permittee Agencies want to have covered by FESA Section 10 and CESA 2081(b) permits. Covered Activities include both specific projects and ongoing activities (e.g., operations and maintenance).

- *Projects* are well-defined actions that occur **once** in a discrete location (e.g., construction of new facilities, infrastructure development, capital improvement projects).
- *Operations and maintenance activities* are actions that occur **repeatedly** in one area or over a wide area (e.g., bank stabilization, storm-damage repair, maintenance of facilities).

Covered Activity types are listed in Table ES-2, and include construction, infrastructure development, and operations and maintenance of water conservation, water infrastructure development, flood control, habitat restoration, and solar energy facility activities. The Covered Activities are described in detail in Chapter 2, *Covered Activities*, including the size of the impacted area, frequency of activity, and the type and intensity of impact. The potential effects of the Covered Activities on Covered Species are analyzed in Chapter 4, *Take Assessment and Impact Analysis*.

Table ES-2. Covered Activity Types Included in the Upper SAR HCP

Activity Type	Description
Water Reuse Projects (Figure 2-1)	Activities related to projects associated with water reuse, including construction of new water treatment plants and associated facilities, and operations and maintenance of existing and new water treatment plants and associated facilities.
Groundwater Recharge (Figure 2-4)	Activities related to construction of new structures associated with diversions, operations and maintenance of existing and new diversion structures for groundwater recharge, activities related to construction of new recharge basins, and operations and maintenance of existing and new recharge basins.

Activity Type	Description
Wells and Water Conveyance Infrastructure (Figure 2-14)	Activities related to the creation of new wells and associated development (e.g., pipelines, access roads, reservoirs, bridges) and the operations and maintenance of this infrastructure and associated development.
Solar Energy Development (Figure 2-21)	Activities related to the construction and the operations and maintenance of new solar facilities.
Routine Operations and Maintenance (See other figures)	Activities that occur repeatedly in one location and/or in many locations over a wide area and include minor construction, earth-moving, or vegetation clearing activities to infrastructure.
Habitat Enhancement, Management, and Monitoring (Figure 2-21)	Activities that support the restoration and management of habitat values in the Planning Area, including species surveys, monitoring, research, and adaptive management activities.

Covered Activities are also anticipated to occur in different phases during implementation of the HCP. These HCP phases are as follows:

- **Phase 1**—0 to 5 years from permit issuance
- **Phase 2**—6 to 10 years from permit issuance
- **Phase 3**—11 to 15 years from permit issuance
- **Phase 4**—16 years from permit issuance to end of permit term

Activities not covered by the HCP and the incidental take authorizations are described in Chapter 2, Section 2.3, *Projects and Activities Not Covered by the HCP*.

ES.5 Take Assessment and Impact Analysis

The Covered Activities will have effects on Covered Species through the alternation of hydrology in the Santa Ana River and tributaries, which in turn may affect depth to groundwater for some groundwater-dependent ecosystems. Alteration of hydrology may also affect sediment transport, a natural ecological process that shapes the ecology of the alluvial fan sage scrub community and the aquatic and riparian communities. Other Covered Activities will affect Covered Species by direct ground-disturbing impacts on the vegetation supporting their habitat. Chapter 3 describes the current distribution of species and habitats in the Planning Area, and uses hydrology modelling to describe the sediment transport processes in the watershed. The hydrology model is integrated with a groundwater model to describe the existing surface water and groundwater conditions as they relate to aquatic habitats and groundwater-dependent ecosystems. These models are used in Chapter 4 to estimate the effects that Covered Activities have on sediment transport, surface water flows, and groundwater so that an estimate of potential incidental take of Covered Species can be made. The Covered Activities are also evaluated to determine the amount of Covered Species habitat directly lost due to ground-disturbing impacts.

These take estimates are as accurate as possible using the methods described in Chapter 4 and given the available details of the Covered Activities at the time of HCP preparation. These take estimates

represent a maximum potential take estimate for each species. With the implementation of avoidance and minimization measures and more precise project-specific design, the take is expected to be lower than estimated in most cases. In no case will the take of any species be allowed to exceed the take estimate established by this HCP. Furthermore, these methods to estimate take are based on habitat suitability models and the potential impacts on modeled habitat, not occupied habitat. The area of potentially suitable habitat predicted by the models is much larger than the area of occupied habitat at any given moment in time, such that the actual impacts on occupied habitat will be substantially less. Actual impacts will be further minimized through the implementation of general and species-specific avoidance and minimization measures.

ES.5.1 Summary of Effects on Species

The mitigation provided by the conservation actions (Chapter 5) will provide significant net benefits to Covered Species through the addition of permanent protections, restoration and enhancement, monitoring, and management. The potential impacts from Covered Activities should be considered in the context of the net benefit to species resulting from the implementation of the conservation strategy.

Table ES-3. Summary of Estimated Impacts and Expected Outcome of Actual Take

Common Name	Estimated Total Impacts on Modeled Habitat (acres)	Mitigation (acres of Modeled and restored Habitat in the HCP Preserve System)	Expected Outcome of Actual Take of Species
Covered Species			
Slender-horned spineflower	400 ¹ (no impacts on extant occurrences)	877	Strict avoidance and minimization measures will ensure direct take of individual plants is near zero. Suitable habitat will be monitored and managed to enhance habitat conditions for this species and will be protected in perpetuity.
Santa Ana River woolly-star	446	728	Strict avoidance and minimization measures will ensure direct take of individual plants is near zero. Suitable habitat will be monitored and managed to enhance habitat conditions for this species and will be protected in perpetuity.
Santa Ana sucker	1.25	5.1 (including 1.5 acres of enhancement in mainstem Santa Ana River and 3.6 acres of tributary restoration) Santa Ana sucker will also be translocated to a minimum of three montane streams and actively managed	A majority of actions in the USFWS Recovery Plan for this species will be implemented within the HCP Preserve System through implementation of the HCP Conservation Strategy. Habitat enhancement and restoration will occur ahead of any impacts on suitable habitat. Population stability and distribution will be substantially improved through tributary restoration and translocation before

Common Name	Estimated Total Impacts on Modeled Habitat (acres)	Mitigation (acres of Modeled and restored Habitat in the HCP Preserve System)	Expected Outcome of Actual Take of Species
			any direct impacts on the species can occur. Suitable habitat will be monitored and managed to enhance habitat conditions for this species and will be protected in perpetuity. While the suitable habitat in the mainstem of the Santa Ana River will be reduced as a result of implementation of Covered Activities, the restoration, enhancements and translocation actions within the HCP Preserve System will offset these impacts and make major contributions to the recovery of the Santa Ana Sucker.
Arroyo chub	2.4	5.1 (1.5 acres of enhancement in mainstem Santa Ana River and 3.6 acres of tributary restoration)	Population stability and distribution will be substantially improved through tributary restoration before any direct impacts on the species can occur. Suitable habitat in all occupied reaches of the Santa Ana River and tributaries will be monitored and managed to enhance habitat conditions for this species. All areas of suitable habitat within the HCP Preserve System will be protected in perpetuity.
Santa Ana speckled dace	0.01	0.0	Strict avoidance and minimization measures will ensure direct take of this species is near zero. Any individuals found in downstream reaches during surveys will be relocated back to occupied reaches of montane streams. Direct impacts on habitat are very limited.
Mountain yellow-legged frog	128 (including 4 acres of aquatic habitat)	264 (including 16 acres of aquatic habitat)	Less than 2% of the impacted habitat is aquatic habitat. The remaining 124 acres are refugia, foraging, and dispersal upland habitats. Strict avoidance and minimization measures will ensure direct take of this species is near zero. Population stability and distribution will be improved through HCP contributions to the mountain yellow-legged frog translocation program. Suitable habitat will be monitored and managed to enhance habitat conditions for this species and will be protected in perpetuity.
Western spadefoot	723	987	Avoidance and minimization measures will ensure direct take of this species is

Common Name	Estimated Total Impacts on Modeled Habitat (acres)	Mitigation (acres of Modeled and restored Habitat in the HCP Preserve System)	Expected Outcome of Actual Take of Species
			substantially lower than the estimated impact on modeled habitat. Suitable habitat within the HCP Preserve System, including ephemeral pools and groundwater recharge basins used for breeding, will be monitored and managed to enhance habitat conditions for this species and will be protected in perpetuity.
California glossy snake	897	1,209	Avoidance and minimization measures will ensure direct take of this species is substantially lower than the estimated impact on modeled habitat. Suitable habitat within the HCP Preserve System will be monitored and managed to enhance habitat conditions for this species and will be protected in perpetuity.
South coast garter snake	21	193 (including restoration of 129 acres of riparian and 3.5 miles of aquatic stream habitat)	Avoidance and minimization measures will ensure direct take of this species is substantially lower than the estimated impact on modeled habitat. Suitable habitat within the HCP Preserve System will be monitored and managed to enhance habitat conditions for this species and will be protected in perpetuity.
Southwestern pond turtle	34 (including 2 acres of aquatic habitat)	344 (29 acres aquatic habitat and 315 upland habitat, including restoration of 193 acres riparian habitat and 3.5 miles of aquatic stream habitat)	Avoidance and minimization measures will ensure direct take of this species is substantially lower than the estimated impact on modeled habitat. Suitable habitat within the HCP Preserve System will be monitored and managed to enhance habitat conditions for this species and will be protected in perpetuity.
Tricolored blackbird	425 (including 54 acres of unoccupied but suitable colony habitat and 370 acres of foraging habitat)	387 (including 86 acres of modeled colony habitat, 131 acres of created colony habitat, 157 acres of modeled foraging habitat, and 14 acres of created foraging habitat)	Avoidance and minimization measures will ensure no occupied colonies are disturbed. An additional 30 acres of suitable colony habitat will be restored. Suitable habitat within the HCP Preserve System will be monitored and managed to enhance habitat conditions for this species and will be protected in perpetuity.
Burrowing owl	876	1,031	Avoidance and minimization measures will reduce the potential for occupied burrows to be disturbed. Suitable habitat within the HCP Preserve

Common Name	Estimated Total Impacts on Modeled Habitat (acres)	Mitigation (acres of Modeled and restored Habitat in the HCP Preserve System)	Expected Outcome of Actual Take of Species
			System will be monitored and managed to enhance habitat conditions for this species and will be protected in perpetuity.
Cactus wren	821	1,069	Avoidance and minimization measures will ensure active nests are not disturbed. Suitable habitat within the HCP Preserve System will be monitored and managed to enhance habitat conditions for this species and will be protected in perpetuity.
Yellow-breasted chat	150	257 (including restoration of 221 acres of riparian habitat)	Avoidance and minimization measures will ensure active nests are not disturbed. Suitable habitat within the HCP Preserve System will be monitored and managed to enhance habitat conditions for this species and will be protected in perpetuity. A total of 221 acres of habitat will be restored, including restoration of 51 acres that are not currently identified as modeled habitat.
Western yellow-billed cuckoo	17	143	Avoidance and minimization measures will ensure active nests and occupied habitat are not disturbed. Suitable habitat within the HCP Preserve System will be monitored and managed to enhance habitat conditions for this species and will be protected in perpetuity.
Southwestern willow flycatcher	150	257 (including restoration of 221 acres of riparian habitat)	Avoidance and minimization measures will ensure active nests and occupied habitat are not disturbed. Suitable habitat within the HCP Preserve System will be monitored and managed to enhance habitat conditions for this species and will be protected in perpetuity. A total of 221 acres of habitat will be restored, including restoration of 51 acres that are not currently identified as modeled habitat.
Coastal California gnatcatcher	444	843 (including 222 acres of alluvial fan sage scrub restoration)	Avoidance and minimization measures will ensure active nests are not disturbed. Suitable habitat within the HCP Preserve System will be monitored and managed to enhance habitat conditions for this species and will be protected in perpetuity. A total

Common Name	Estimated Total Impacts on Modeled Habitat (acres)	Mitigation (acres of Modeled Habitat in the HCP Preserve System)	Expected Outcome of Actual Take of Species
Least Bell's vireo	150	257 (including restoration of 221 acres of riparian habitat)	of 222 acres of alluvial fan sage scrub habitat will be enhanced and restored. Avoidance and minimization measures will ensure active nests are not disturbed. Suitable habitat within the HCP Preserve System will be monitored and managed to enhance habitat conditions for this species and will be protected in perpetuity. A total of 221 acres of habitat will be restored, including restoration of 51 acres that are not currently identified as modeled habitat.
Los Angeles little pocket mouse	739	1,007 (including 220 acres of alluvial fan sage scrub restoration)	Suitable habitat within the HCP Preserve System will be monitored and managed to enhance habitat conditions for this species and will be protected in perpetuity. A total of 220 acres of alluvial fan sage scrub habitat will be enhanced and restored.
San Bernardino Merriam's kangaroo rat	552	894 (including 220 acres of alluvial fan sage scrub restoration)	Avoidance and minimization measures will ensure that take of individuals and occupied habitat is reduced to the greatest extent practicable. These measures include habitat assessments, exclusionary fencing, trapping surveys, relocation, topsoil sequestration, and timing and night-lighting limitations. Suitable habitat within the HCP Preserve System will be monitored and managed to enhance habitat conditions for this species and will be protected in perpetuity. A total of 220 acres of alluvial fan sage scrub habitat will be enhanced and restored to be suitable for this species.
Fully Avoided Species ("No Take" Species)¹			
Delhi Sands flower-loving fly	101 ¹ (No impact on occupied habitat)		Strict avoidance measures will ensure no take of this species.
Arroyo toad	82 ¹ (No impact on occupied habitat)		Strict avoidance measures will ensure no take of this species.

¹ Implementation of avoidance measures as described in Chapter 5 would prevent the direct take of these species.

ES.6 Habitat Conservation Plan Conservation Strategy

The Upper SAR HCP conservation strategy (Chapter 5) is designed to avoid, minimize, and mitigate impacts of the taking of the Covered Species to the maximum extent practicable. The strategy meets the regulatory requirements of FESA and CESA.

Implementation of the Conservation Strategy is the responsibility of the Upper SAR Sustainable Resources Alliance (Alliance), which will be established as a Joint Powers Authority (JPA) of the HCP. The Alliance will be responsible for implementing the HCP and all conservation actions described in the Conservation Strategy and assisting the other Permittee Agencies in complying with the conditions of the HCP Incidental Take Permit in connection with their Covered Activities.

ES.6.1 Elements of the Conservation Strategy

The conservation strategy includes all conservation actions as mitigation to offset the impacts of take of Covered Species. The conservation actions are based on the biological needs of the Covered Species and, when fully implemented, will meet the biological goals and objectives of the HCP. The elements of the conservation strategy are listed below and are described in more detail in the sections that follow. The phasing of the implementation of these conservation actions in relationship to the implementation of Covered Activities is also described below.

Elements of the Upper SAR HCP Conservation Strategy:

- Biological Goals and Objectives
- HCP Preserve System
 - Conservation Areas (acquisitions and easements)
 - Restoration Areas (Santa Ana sucker, wetland/riparian, and alluvial fan scrub)
- Hydrologic Manipulation and Substrate Management
- Captive Rearing and Translocation
- Species and Habitat Research
- Conservation Bank Credits
- Species-Specific Conservation Strategies
- Fully Avoided Species
- Measures to Avoid and Minimize Take
- Comprehensive Adaptive Management and Monitoring Program (CAMMP)

ES.6.2 Habitat Conservation Plan Goals and Objectives

The Upper SAR HCP has four overarching goals and seven HCP Objectives as listed below.

The HCP Goals will be accomplished within the HCP Preserve System and are as follows:

- **HCP Goal 1:** Conserve Covered Species and their habitats to contribute to the recovery of listed species or those that may become listed under the ESA.
- **HCP Goal 2:** Sustain the ecological processes necessary to maintain the functionality of the natural communities and habitats upon which the Covered Species depend.
- **HCP Goal 3:** Maintain and improve habitat connectivity in the HCP Preserve System and to adjacent protected habitat areas to facilitate movement and genetic exchange between populations of Covered Species.
- **HCP Goal 4:** Actively manage lands within the HCP Preserve System to maintain or improve conditions for the benefit of Covered Species.

The following seven HCP Objectives will support the HCP Goals:

- **HCP Objective 1:** Conserve and manage 1,901.5 acres of native habitat in the HCP Preserve System.
- **HCP Objective 2:** Restore and re-establish 538.6 acres of habitat for Covered Species.
- **HCP Objective 3:** Reduce anthropogenic and environmental threats to the HCP Preserve System.
- **HCP Objective 4:** Maintain and enhance existing Santa Ana sucker habitat.
- **HCP Objective 5:** Maintain and enhance existing San Bernardino kangaroo rat habitat.
- **HCP Objective 6:** Implement Relocation or Translocation of Covered Species.
- **HCP Objective 7:** Improve knowledge of Covered Species.

ES.6.3 Habitat Conservation Plan Preserve System

The Alliance—as the HCP Implementing Entity—will provide for the permanent conservation of approximately 1,902 acres within the HCP Preserve System. The HCP Preserve System will be assembled through a combination of property acquisitions, establishment of conservation easements, and other permanent conservation land designations. All habitat restoration will occur on land within the HCP Preserve System. The HCP Preserve System will be managed and monitored through the CAMMP that will be implemented by the Alliance. The HCP Preserve System is divided into five Preserve Units(Figure 5-1).

HCP implementation has been separated into four phases that align with the phases of Covered Activity implementation (Table ES-4). Conservation actions and associated mitigation will occur before, and stay ahead of, the impacts of Covered Activities (Table ES-5). The phasing is based on best estimates for approximate timing. The actual implementation of Covered Activities, restoration, and conservation may vary. Regardless, the restoration and conservation as mitigation established by the HCP will stay ahead of the impacts by a minimum of 10%. The Alliance will ensure that HCP implementation is in compliance with this Stay Ahead Provision by monitoring and tracking the establishment of the HCP Preserve System and restoration projects along with tracking of impacts using the impact and mitigation tracking of the Mitigation Reserve Program described below.

Table ES-4. Approximate Phasing of Conservation of Vegetation Communities in the HCP Preserve System (acres)

Conserved Vegetation Types	Implementation Period (years)				HCP Preserve System Total
	Phase 1 (0-5)	Phase 2 (6-10)	Phase 3 (11-15)	Phase 4 (>15)	
Riparian	126.9	92.7	--	--	219.6
Wetlands	64.0	25.4	--	--	89.3
Permanent Water	35.5	17.2	--	--	52.7
Water in Existing Basins	--	--	--	--	--
Dry Channel/Shrubland ¹	121.0 (98.0)	48.2 (4.7)	--	--	169.3 (102.7)
Shrublands ¹	856.0 (741.9)	266.6 (35.1)	--	--	1,122.6 (776.9)
Woodlands	21.0	--	--	--	21.0
Grasslands	155.2	44.8	--	--	200.0
Rock Outcrops	26.7	0.2	--	--	26.9
Total by Phase	1,406.3	495.2	--	--	1,901.5
<i>Total Alluvial Fan Sage Scrub by Phase¹</i>	<i>839.9</i>	<i>39.8</i>	<i>--</i>	<i>--</i>	<i>879.6</i>

¹ Shrublands and Dry Channel/Shrubland include alluvial fan sage scrub acres as shown in parentheses.

Table ES-5. Stay Ahead Provision Tracking by HCP Phase

	Implementation Period (years)				Total
	Phase 1 (0-5)	Phase 2 (6-10)	Phase 3 (11-15)	Phase 4 (>15)	
Conservation	65%	35%	--	--	100%
Restoration	43%	51%	6%	--	100%
Covered Activity Impacts	46%	35%	10%	9%	100%

Mitigation Reserve Program (Mitigation Accounting)

The Alliance will establish a Mitigation Reserve Program to account for and track the development of mitigation value (i.e., “credits”) and application of those mitigation values to future permit requirements for HCP Covered Activities. The purpose of the Mitigation Reserve Program is to establish a common understanding and legal framework for the conservation and mitigation values created by HCP conservation actions, and to establish a transparent mechanism for tracking those values (debits and credits) over time. In this way, the Mitigation Reserve Program will be used to inform and track regulatory compliance of the HCP Covered Activities, including species and aquatic resource mitigation, and ensure that HCP implementation is in compliance with the Stay Ahead Provision.

ES.6.4 Comprehensive Adaptive Management and Monitoring Program Framework

The HCP includes an adaptive management and monitoring framework for the HCP, including guidelines, and specific recommendations that will help the Alliance develop the Upper SAR HCP CAMMP. The purposes of this CAMMP framework—and one of the primary purposes of the CAMMP itself—are to ensure compliance with the HCP, to assess the status of Covered Species within the HCP Preserve System, and to evaluate the effects of management actions such that the conservation strategy, including the biological goals and objectives of the HCP, are achieved. Adaptive management and monitoring are integrated processes in the CAMMP, and monitoring will inform and change management actions to continually improve outcomes for Covered Species.

ES.7 Funding Implementation of the Habitat Conservation Plan

Chapter 7 provides planning-level estimates of the costs to implement the HCP, identifies funding sources to pay for implementation, and describes the rationale for funding assurances. The HCP is estimated to cost approximately \$187.5 million in 2020 dollars, including costs over 50 years without discounting and inflation. Tables ES-6 through ES-8 summarize the total, capital, and operational costs estimated to be necessary to carry out the HCP.

The cost analysis is based on a number of assumptions regarding the timing of implementation of various components of the HCP and the estimated unit costs of land, 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 approximate amount of funding needed to implement the HCP. Specific costs will be refined as they are ascertained during the first years of HCP implementation, and any adjustments to the overall costs, cost-sharing agreements among Permittee Agencies, and endowment requirements will be made as needed.

Table ES-6. Summary of Upper SAR HCP Total Implementation Costs (1,000s 2018 dollars)

Total Costs ¹	Implementation Period (years)					Total Costs ³
	Initial 0 ²	Phase 1 1–5	Phase 2 6–10	Phase 3 11–15	Phase 4 16–20	
Land Acquisition & Easements	\$0	\$26,372	\$6,843	\$0	\$0	\$33,215
Restoration	\$24,350	\$5,811	\$4,548	\$973	\$1,561	\$37,243
Fish Translocation	\$255	\$381	\$122	\$72	\$504	\$1,334
Management and Maintenance	\$0	\$1,788	\$2,065	\$2,138	\$14,966	\$20,957
Monitoring and Reporting	\$0	\$722	\$722	\$722	\$4,798	\$6,964

Total Costs¹	Implementation Period (years)					Total Costs³
	Initial 0²	Phase 1 1-5	Phase 2 6-10	Phase 3 11-15	Phase 4 16-20	
Staffing and Program Administration	\$0	\$6,245	\$6,245	\$6,117	\$42,819	\$61,426
Endowment Fund	\$0	\$1,484	\$1,484	\$1,484	\$10,388	\$14,840
Changed Circumstance Reserve	\$3,660	\$3,809	\$1,659	\$392	\$1,952	\$11,472
Total	\$28,265	\$46,612	\$23,688	\$11,898	\$76,988	\$187,451
Total Per Year		\$9,322	\$4,738	\$2,380	\$2,200	\$3,749

¹ All costs rounded to the nearest \$1,000.

² Year 0 costs are costs that will have been incurred prior to the start of the HCP.

³ Total Costs sum across all years with no discounting

Table ES-7. Summary of Upper SAR HCP Capital Costs (1,000s 2018 dollars)

Capital Costs¹	Implementation Period (years)					Total Costs³
	Initial 0²	Phase 1 1-5	Phase 2 6-10	Phase 3 11-15	Phase 4 16-20	
Land Acquisition & Easements	\$0	\$26,372	\$6,843	\$0	\$0	\$33,215
Restoration	\$24,350	\$3,711	\$800	\$750	\$0	\$29,611
Fish Translocation	\$255	\$0	\$0	\$0	\$0	\$255
Management and Maintenance	\$0	\$0	\$0	\$0	\$0	\$0
Monitoring and Reporting	\$0	\$0	\$0	\$0	\$0	\$0
Staffing and Program Administration	\$0	\$0	\$0	\$0	\$0	\$0
Endowment Fund	\$0	\$0	\$0	\$0	\$0	\$0
Changed Circumstance Reserve	\$3,660	\$3,194	\$804	\$113	\$0	\$7,771
Total	\$28,266	\$33,277	\$8,447	\$863	\$0	\$70,852
Total Per Year		\$6,655	\$1,689	\$173	\$0	\$1,417

¹ All costs rounded to the nearest \$1,000.

² Year 0 costs are costs that will have been incurred prior to the start of the HCP.

³ Total Costs sum across all years with no discounting.

Table ES-8. Summary of Upper SAR HCP Operating Costs (1,000s 2018 dollars)

Operating Costs ¹	Implementation Period (Years)					Total Costs ³
	Initial 0 ²	Phase 1 1-5	Phase 2 6-10	Phase 3 11-15	Phase 4 16-20	
Land Acquisition & Easements	\$0	\$0	\$0	\$0	\$0	\$0
Restoration	\$0	\$3,065	\$4,713	\$922	\$6,453	\$15,153
Fish Translocation	\$0	\$1,108	\$849	\$547	\$3,832	\$6,337
Management and Maintenance	\$0	\$2,978	\$3,256	\$3,626	\$25,385	\$35,245
Monitoring and Reporting	\$0	\$1,744	\$1,744	\$1,964	\$13,494	\$18,946
Staffing and Program Administration	\$0	\$2,340	\$2,340	\$2,212	\$15,484	\$22,376
Endowment Fund	\$0	\$1,484	\$1,484	\$1,484	\$10,386	\$14,837
Changed Circumstance Reserve	\$0	\$616	\$855	\$280	\$1,952	\$3,703
Total	\$0	\$13,335	\$15,240	\$11,036	\$76,986	\$116,597
Total Per Year		\$2,667	\$3,048	\$2,207	\$2,200	\$2,332

¹ All costs rounded to the nearest \$1,000.

² Year 0 costs are costs that will have been incurred prior to the start of the HCP.

³ Total Costs sum across all years with no discounting.

ES.7.1 Funding Sources and Assurances

The single joint ITP permit structure was determined to be the best arrangement to facilitate ongoing coordination among the Permittee Agencies. In particular, this structure will allow the Permittee Agencies to enter into enforceable arrangements to allocate operational and funding responsibilities and rectify any occurrence of non-compliance by a Permittee Agency. The costs of the HCP will be borne by the Permittee Agencies in accordance with the Joint Powers Authority Agreement and a separate Participation and Financing Agreement (PFA) that fully accounts for and assigns financial responsibility of the Alliance among the Permittee Agencies. The PFA will describe the financial responsibilities of each of the Permittee Agencies with respect to the HCP and the Alliance. The cost of plan implementation will be shared among the Permittee Agencies, based on a cost-sharing mechanism developed and approved by all agencies. The cost-sharing mechanism will account for impacts of the individual Covered Activity, as well as both the financial and in-kind contributions by the Permittee Agencies

Each of the Permittee Agencies will be fully responsible for any Covered Activity undertaken by that agency under the HCP and will be required to coordinate with the Alliance staff in order to ensure consistency of the Covered Activity with the HCP. Any cost resulting from non-compliance with the terms of the ITP by any Permittee Agency will be the responsibility of the non-complying agency.

ES.7.2 Cost-Effectiveness of the Habitat Conservation Plan

Over the 50-year life of the HCP, the \$187.5 million investment will allow Permittee Agencies to develop over 4 million acre-feet of water cumulatively for local use, or approximately 87,000 afy by year 15. These water resources will reduce reliance on imported water from other parts of the state, increasing the area's resilience to drought and regulatory restrictions that hamper water deliveries from the State Water Project. The net benefits of this investment to water users and the local economy amount to an estimated \$952 million as a whole, generating a benefit-cost ratio in excess of 7.3. This total net benefit illustrates the enormity of this HCP effort.

Without the benefit of the water projects facilitated by the HCP, potential alternatives to meet the full 87,000 acre-feet of water include purchasing additional water or desalination, options that are costly compared to both current water supplies and to alternatives facilitated by the HCP. Imported water from the Metropolitan Water District of Southern California (Metropolitan) currently costs \$2,007 per acre-foot for treated Tier 2 water. This Tier 2 rate is set at Metropolitan's cost of purchasing water transfers north of the Sacramento-San Joaquin Delta and includes all costs associated with moving that water to Southern California. The Tier 2 rate is the best proxy for the price Permittee Agencies would have to pay if they pursued their own private water transfers. Desalination is the other alternative water supply option available to Southern California that does not depend on moving water through the Delta. It is estimated to cost about \$2,019 per acre-foot based on the midpoint of existing desalination projects in Southern California. Using the lower Metropolitan price as a proxy for what HCP partner agencies would need to spend to acquire new supplies, the same volume of water would cost \$3.2 billion over the life of the HCP, on a net present value (NPV) basis.³ However, there is no guarantee that such a large volume of water would even be reliably available for purchase, and developing sufficient equivalent capacity of desalination projects presents its own regulatory and geographic hurdles. For these reasons, the \$3.2 billion cost for an alternative portfolio is considered to be conservative and biased toward a low estimate of projected savings made possible by the HCP.

With the HCP Covered Activities in place, Permittee Agencies will be able to develop the same amount of water at an NPV cost of approximately \$2.2 billion. The NPV of water supply costs without the HCP is \$3.2 billion, compared to an NPV of \$2.2 billion with the HCP. This is an estimated savings of over \$1.1 billion from water supply projects.

This potential savings puts the HCP total cost in perspective. The \$187.5 million undiscounted total HCP cost translates to a NPV of \$129 million. Based on the savings estimated from water supply projects and the cost of the HCP, pursuing the HCP over alternative water supply options could result in net savings of \$952 million or more in NPV. This cost saving will be passed on to commercial and residential water customers throughout the HCP area (Table ES-9).

Table ES-9. HCP Net Savings Estimate in Net Present Value (\$1,000s)

	Water Supply Cost	HCP Cost	Net Savings (cost)
With HCP	\$2,162	\$129 ¹	
Without HCP	\$3,243	\$0	
Total savings (cost)	\$1,081	-\$129	\$952

³ NPV calculations are made using an interest rate of 4.61% based on the rate used by the State Water Project in calculating water prices. The general inflation rate is assumed to be 2%. The net discount rate is 2.61%.

¹ Note that this total HCP cost is presented in NPV. It is equivalent to the \$187.5 million undiscounted total cost presented elsewhere in this chapter, but shown in NPV so that it can be compared to alternative scenarios on a comparable basis.

ES.8 From Conflict to Collaboration

Remarkably, this HCP was born from the depths of conflict and legal battles over the listing of the Santa Ana sucker as a federally threatened species and the subsequent designation of Critical Habitat. The growing population of the Upper SAR watershed was in need of a reliable source of water, resilient to the extended droughts, effects of climate change, reduced State Water Project supplies, and increasing costs. The listings of the Santa Ana sucker and the other Federal and State listed species were standing in the way, pitting people against fish, water agencies against regulatory agencies, and human needs against the needs of the environment. It was a fight with no winners, and it became increasingly clear that the only path forward was a path of collaboration. Failure was not an option.

Through the acceptance that people need water and so do fish and what's good for the River is good for people too, a spirit of interagency collaboration emerged. The water agencies, regulatory agencies, and other stakeholders each took a seat at the table with a firm commitment to work together, understanding each other's needs and interests, finding common ground to craft a solution that was good for everyone—the people, the species, the water.

The preparation of this HCP is *the* viable solution to balancing the competing demands on the limited availability of water. This HCP exists through the partnership and the collaborative efforts of the Permittee Agencies, Wildlife Agencies, and involved stakeholders. Through this collaboration, this regional, comprehensive program will provide the necessary framework to protect, enhance, and restore the habitat for Covered Species, while streamlining permitting of Covered Activities, providing a reliable source of water for people. This HCP will enable the water agencies to continue to provide and maintain a secure source of water for the residents and businesses in the watershed, and to conserve and maintain natural habitats that provide a home for the diversity of unique and rare species in the watershed.