



California Department of Fish and Game  
4665 LAMPSON AVENUE, SUITE J  
LOS ALAMITOS, CA 90720

California Endangered Species Act  
Incidental Take Permit No. 2081-2005-008-06

CALIFORNIA WATER AND POWER AGENCIES  
LOWER COLORADO RIVER MULTI-SPECIES CONSERVATION PROGRAM

**Authority:** This California Endangered Species Act ("CESA") Incidental Take Permit ("permit") is issued by the Department of Fish and Game ("Department") pursuant to Fish and Game Code section 2081(b) and section 2081(c), and California Code of Regulations, title 14, subdivision 3, chapter 6, article 1, commencing with section 783. CESA prohibits the take<sup>1</sup> of any species of wildlife that is included in the list of endangered species, the list of threatened species, or the list of candidate species<sup>2</sup>. However, the Department may authorize, by permit, the take of such species if the conditions set forth in section 2081(b) and section 2081(c) are met. In 2003, the Legislature enacted legislation authorizing the Department to authorize the take of "fully protected" species from impacts attributable to the implementation of the Quantification Settlement Agreement and the IID Water Transfer Project. (Fish and Game Code, section 2081.7(a); Stats. 2003, Chapter 612.)

**Permittees:**

**Agency Name:** Bard Water District  
**Mailing Address:** 1473 Ross Road, Winterhaven, CA 92283-9715  
**Telephone Number:** 760-572-0704  
**Contact Person:** Ron Derma

**Agency Name:** Colorado River Board of California  
**Mailing Address:** 770 Fairmont Avenue, Suite 100, Glendale, CA 91203-1035  
**Telephone Number:** 818-543-4676  
**Contact Person:** Gerald R. Zimmerman

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<sup>1</sup>Pursuant to Fish and Game Code section 86, "'Take' means hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill."

<sup>2</sup>"Candidate species" are species of wildlife that have not yet been placed on the list of endangered species or the list of threatened species, but which are under formal consideration for listing pursuant to Fish and Game Code section 2074.2.

**Agency Name:** Coachella Valley Water District  
**Mailing Address:** P.O. Box 1058, Coachella CA 92236  
**Telephone Number:** 760-398-2651  
**Contact Person:** Steve Robbins

**Agency Name:** Imperial Irrigation District  
**Mailing Address:** P.O. Box 937, Imperial, CA 92251  
**Telephone Number:** 760-339-9477  
**Contact Person:** Jesse Silva

**Agency Name:** City of Los Angeles Department of Water and Power  
**Mailing Address:** 111 North Hope Street, Room 1121, Los Angeles, CA 90012  
**Telephone Number:** 213-367-0285  
**Contact Person:** Charles Holloway

**Agency Name:** The Metropolitan Water District of Southern California  
**Mailing Address:** P.O. Box 54153, Los Angeles, CA 90054-0153  
**Telephone Number:** 213-217-6242  
**Contact Person:** Laura Simonek

**Agency Name:** The City Of Needles  
**Mailing Address:** 817 Third Street, Needles, CA 92363-2933  
**Telephone Number:** 760-326-2113  
**Contact Person:** Richard Rowe

**Agency Name:** Palo Verde Irrigation District  
**Mailing Address:** 180 West Fourteenth Avenue, Blythe, CA 92225  
**Telephone Number:** 760-922-3144  
**Contact Person:** Ed Smith

**Agency Name:** San Diego County Water Authority  
**Mailing Address:** 4677 Overland Avenue, San Diego, CA 92123  
**Telephone Number:** 858-522-6752  
**Contact Person:** Laurence Purcell

**Agency Name:** Southern California Edison Company  
**Mailing Address:** 2244 Walnut Grove Avenue, Rosemead, CA 91770  
**Telephone Number:** 626-302-4459  
**Contact Person:** Nino Mascolo

**Agency Name:** Southern California Public Power Authority  
**Mailing Address:** 225 S. Lake Avenue, Suite 1250, Pasadena, CA 91101  
**Telephone Number:** 626-793-9364  
**Contact Person:** Bill D. Carnahan

**Project location:**

The project area includes the California portion of the Colorado River historical floodplain starting from the point at which it enters California extending downstream to the Northerly International Boundary ("NIB") with the Republic of Mexico. The project area also includes up to and including the full-pool elevation of Lake Havasu, which is defined by surface water elevation 450 feet National Geodetic Vertical Datum and corresponds to the top of the Parker Dam spillway gates (Bureau of Reclamation 1981). The historic floodplain includes all lands that are or have been affected by the meandering or regulated flows of the Colorado River, which historically have been confined by the change in elevation that forms the adjoining uplands within this segment of the lower Colorado River ("LCR").

The project area does not include the Imperial Irrigation District ("IID") Service Area, Coachella Valley Water District ("CVWD") Service Area, Metropolitan Water District's ("MWD") Service Area, San Diego County Water Authority ("SDCWA") Service Area, the Salton Sea, or the Salton Sink. Impacts to these areas are outside the defined project area and are not covered by this permit.

The project area is divided into discrete reaches. A full description of all river reaches that comprise the Lower Colorado River Multi-Species Conservation Program ("LCR MSCP") planning area is provided in LCR MSCP Habitat Conservation Plan ("HCP") Chapter 1. The geographic scope of the project is the California portion of Reaches 3-6 of the LCR MSCP planning area. For use in the analysis of impacts of the covered activities, the project area has been divided to correspond to LCR MSCP river reaches 3-6:

- Reach 3—from Davis Dam (River Mile [RM] 276) to Parker Dam (RM 192.3), including Lake Havasu up to full-pool elevation;
- Reach 4—from Parker Dam (RM 192.3) to Adobe Ruin and Reclamation Cibola Gage (RM 87.3) at the lower end of Reclamation's maintenance Cibola Division;
- Reach 5—from Reclamation Cibola Gage (RM 87.3) to Imperial Dam (RM 49.2); and
- Reach 6—from Imperial Dam (RM 49.2) to the NIB (RM 23.1).

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Water surface elevation and river miles were determined from LCR Maps, Colorado River Frontwork & Levee System, Arizona-California (Bureau of Reclamation 1976).

**Project background:**

The Permittees, the Bureau of Reclamation ("Reclamation") the U.S. Fish and Wildlife Service ("Service"), other federal agencies, and agencies of the states of Arizona and Nevada have cooperatively developed the LCR MSCP. The LCR MSCP provides the federal take authorization for the California covered activities provided for in this permit. The LCR MSCP includes a Conservation Plan that defines the avoidance, minimization and conservation measures developed to mitigate impacts to covered species from implementation of LCR MSCP covered activities, including those covered in this permit. Because of its oversight responsibility for the Colorado River, Reclamation will be responsible for implementation of the LCR MSCP Conservation Plan.

Permittees, Reclamation and other federal agencies, and agencies of the States of Arizona and Nevada have entered into the LCR MSCP Funding and Management Agreement ("FMA"), dated April 2005. The FMA obligates Reclamation to manage and implement the terms of the LCR MSCP, the Section 10(a)(1)(B) incidental take permit issued by the Service, and the Biological Opinion issued by the Service for the LCR MSCP. The mitigation measures presented in the Conditions of Approval section of this permit for Riparian, Marsh, and Aquatic covered species are derived from the LCR MSCP Conservation Plan. The Conservation Plan provides mitigation to offset impacts for the federal and non-federal LCR MSCP covered activities under the federal Endangered Species Act. California covered activities and mitigation are a subset of these LCR MSCP covered activities and mitigation.

Reclamation, an agency of the United States, is not a Permittee, and in its role as implementing agency for the LCR MSCP, is not subject to the terms of this permit. For the Conditions of Approval in this permit that are implemented as part of the LCR MSCP, the Department will use reasonable efforts to coordinate its activities related to the oversight of this permit through the procedures established under the LCR MSCP.

**Project description:**

The project covered by this permit ("Covered Activities" or "Project") includes four categories of activities: 1) ongoing flow-related activities; 2) future flow-related activities; 3) non-flow-related activities; and 4) hydroelectric power activities. All of the Covered Activities would be implemented within the project area as defined in the "Project Location" section of this permit and take place for up to 50 years. Specific activities

associated with each of the four categories of Covered Activities are described in detail below.

#### A. Ongoing Flow-Related Covered Activities

Ongoing flow-related activities are: 1) diversion of up to 4.4 million acre-feet per year (maf) of California's full annual entitlement according to the Law of the River; 2) generation of return flows by existing entitled Colorado River water users in California (excluding take associated with total maximum daily loads ("TMDL") and water quality); and 3) additional diversions of water made available through California's share of any unused apportionment and designated surpluses, plus volume of return flows as applicable. Of the entities that divert a portion of California's 4.4 maf full annual entitlement only the following points of diversion and return flows are covered under this category of Covered Activities:

- 1.) City of Needles diversion from wells and return flows;
- 2.) The Metropolitan Water District of Southern California - all diversions and return flows through operation of the Whitsett Pumping Plant and Colorado River Aqueduct facilities in Lake Havasu;
- 3.) Palo Verde Irrigation District ("PVID") – all diversions at Palo Verde Diversion Dam and appurtenant works and features within the PVID. All return flows through the Palo Verde Outfall Drain sluiceways and spill channels, as well as other drain structures and features;
- 4.) Imperial Diversion Dam – all diversions at Imperial Dam including the desilting basins, appurtenant works and features, Pilot Knob Power Plant, and diversions into the All American Canal for delivery, and return flows (where appropriate) associated with:
  - Imperial Irrigation District
  - Coachella Valley Water District
  - Bard Water District component of the Yuma Project – Reservation Division
  - All diversions by the Imperial Irrigation District as operator of the Imperial Dam, Siphon Drop Power Plant and facilities, and the Pilot Knob Power Plant and facilities to deliver water to the Yuma County Water Users Association and to deliver portions of the Mexican Treaty obligation through the All American Canal and Siphon Drop.

- 5.) Lower Colorado Water Supply Project - The Project includes the diversion, use, and any associated return flow of up to a maximum of 10,000 afy of mainstream water (of which approximately 500 acre-feet of current use, and an anticipated 9,500 acre-feet of future use). Project water is intended to ensure that domestic water users using mainstream water within California are brought under contract with the Secretary of Interior pursuant to the Boulder Canyon Project Act and Lower Colorado Water Supply Act;
- 6.) Present perfected rights (PPRs)—identified in the Supreme Court Decree of 1964 in *Arizona v. California* (376 U.S. 340) and in the 1979, 1984 and 2000 U.S. Supreme Court Supplemental Decrees in *Arizona v. California*; and
- 7.) Other Colorado River contractors in California (as identified in Appendix G of the LCR MSCP Appendices) and legal mainstream Colorado River water diverters and their return flows.

#### B. Future Flow-Related Covered Activities

Future flow-related activities by California agencies are diversions, discharges, and return flows through existing facilities on the LCR associated with a change in point of diversion of up to 800,000 afy to the MWD Whitsett Pumping Plant diversion point at Lake Havasu. Those activities will result in a reduction of flow in reaches 4 and 5 (between Parker and Imperial Dam). The calculation of diversion is based on a total of 1.25 mafy diversions by MWD.

The future flow-related covered activities are: (1) the change in point of diversion and diversion of up to 200,000 afy of water from Imperial Dam to the MWD Whitsett Pumping Plant diversion point at Lake Havasu, pursuant to the Agreement for Transfer of Conserved Water by and between the Imperial Irrigation District and the San Diego County Water Authority, dated April 29, 1998, as amended (20,000 acre-feet are scheduled for transfer in 2004 based on a prescribed ramp-up schedule that would occur incrementally over a period of 10 to 20 years until the full amount is reached); (2) the change in point of diversion and diversion of up to 77,700 afy of water from Imperial Dam to the MWD Whitsett Pumping Plant diversion point at Lake Havasu transferred to the San Diego County Water Authority, as described in the Allocation Agreement among the United States of America, the Metropolitan Water District of Southern California, Coachella Valley Water District, Imperial Irrigation District, San Diego County Water Authority, the La Jolla, Pauma, Pala, Rincon, and San Pasqual Bands of Mission Indians, the San Luis Rey River Indian Water Authority, the City of Escondido, and Vista Irrigation District, dated October 10, 2003; and (3) the change in point of diversion and

diversion of up to 522,300 afy of water transferred to MWD at the MWD Whitsett Pumping Plant diversion point at Lake Havasu.

### C. Non-Flow-Related Covered Activities

Non-flow-related activities involve operation, maintenance, and replacement (OM&R) activities associated with the daily routine operation of existing water diversion and conveyance facilities listed below. Operation means all activities associated with routine operation and management of all existing structures, features and facilities through which the Covered Activities are implemented. Maintenance means those routine activities that maintain the capacity and operational features of existing facilities through which the Covered Activities are implemented. Replacement means all activities associated with appropriate periodic repair and/or replacement of all existing structures, features and facilities, within the existing facility footprint, through which the Covered Activities are implemented.

The non-flow-related Covered Activities are:

- 1.) OM&R activities associated with the daily routine operation of PVID and BWD existing water diversion and conveyance facilities (canals and drains) that result in loss and/or degradation of submerged aquatic and/or emergent aquatic vegetation, including removing silt deposits, chaining, and repairing eroded sections along 313 miles of canals within PVID and BWD, and periodic chaining or dredging of 172 miles of drains by PVID and/or BWD to maintain flow capacity; and
- 2.) OM&R activities associated with all diversion facilities, and desilting facilities associated with Imperial Dam, not including the Laguna Division desilting works, in the project area through which the Covered Activities are implemented, including for example pumps, valves, gates, trash racks, machinery, and bankline protection. Inspection and routine maintenance activities are likely to occur on an annual basis. Repair and replacement activities will only be conducted on an as-need basis.

### D. Hydroelectric Power Covered Activities

Hydroelectric power activities covered by this permit include only the contracting for, ordering of, and scheduling of hydroelectric power generated at the federally operated

dams along the Colorado River (e.g., Hoover Dam, Davis Dam, and Parker Dam) by California hydroelectric power contract holders. Electrical power generation at federally operated dams is a federal action, and therefore take of covered species resulting from hydropower generation (e.g. fish mortality from passing through the generator turbines) at the facilities is not covered by this permit.

**Covered Species:**

This permit covers the following species:

<b>Name</b>	<b>Status<sup>3</sup></b>
<u>Fish</u>	
1. Bonytail ( <i>Gila elegans</i> )	Endangered
2. Razorback sucker ( <i>Xyrauchen texanus</i> )	Endangered/ Fully Protected
3. Flannelmouth sucker ( <i>Catostomus latipinnis</i> )	unlisted
<u>Birds</u>	
4. Yuma clapper rail ( <i>Rallus longirostris yumanensis</i> )	Threatened/ Fully Protected
5. California black rail ( <i>Laterallus jamaicensis coturniculus</i> )	Threatened/ Fully Protected
6. Western yellow-billed cuckoo ( <i>Coccyzus americanus occidentalis</i> )	Endangered
7. Elf owl ( <i>Micrathene whitneyi</i> )	Endangered
8. Gilded flicker ( <i>Colaptes chrysoides</i> )	Endangered

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<sup>3</sup>Refers to status under CESA. Under CESA, a species may be on the list of endangered species, the list of threatened species, or the list of candidate species. Species may also be designated as "fully protected" species under Fish and Game Code sections 3511, 4700, 5050, and 5515. All other species are "unlisted."

- |  |            |
|--|------------|
| 9. Gila woodpecker ( <i>Melanerpes uropygialis</i> )                     | Endangered |
| 10. Southwestern willow flycatcher ( <i>Empidonax traillii extimus</i> ) | Endangered |
| 11. Arizona Bell's vireo ( <i>Vireo bellii arizonae</i> )                | Endangered |
| 12. Western least bittern ( <i>Ixobrychus exilis hesperis</i> )          | unlisted   |
| 13. Vermilion flycatcher ( <i>Pyrocephalus rubinus</i> )                 | unlisted   |
| 14. Sonoran yellow warbler ( <i>Dendroica petechia sonorana</i> )        | unlisted   |
| 15. Summer tanager ( <i>Piranga rubra</i> )                              | unlisted   |

Mammals

- |   |          |
|---|----------|
| 16. Western red bat ( <i>Lasiurus blossevillii</i> )              | unlisted |
| 17. Western yellow bat ( <i>Lasiurus xanthinus</i> )              | unlisted |
| 18. Colorado River cotton rat ( <i>Sigmodon arizonae plenus</i> ) | unlisted |

These species and only these species are hereinafter referred to as "Covered Species."

**IMPACT ASSESSMENT:**

This section identifies and describes the effects, within the Project area, of implementing the Covered Activities on Covered Species and their habitats. A stepwise process is used to estimate the level of "take" and impacts to the Covered Species. First, the habitat-based concept is used in defining and delineating Covered Species habitat. This involves the development of habitat models based on the likelihood for each land cover type to support a species' habitat, and delineation of actual habitat within the project area. Second, an analysis of effects to habitat, defined by habitat models, and the Covered Species are presented for each category of covered activity. Changes in environmental conditions that determine and characterize the Covered Species habitat are described. The expected physical, chemical, and biological changes in the habitat provide the basis for assessing the effects on Covered Species.

## Covered Species Habitats - Habitat Models

This section defines habitat for each of the Covered Species and describes the extent of existing habitat in the project area for species for which such information is available. To define and delineate Covered Species habitat, habitat models were developed using the best available information about the known or potential distribution of Covered Species habitat in the project area, and are defined either by:

- the likelihood for each land cover type to support a species (17 species), and
- delineation of actual habitat within the project area (one species).

With the exception of the southwestern willow flycatcher, all other Covered Species habitats have not been directly field delineated in the project area. The models define habitat for each Covered Species as the LCR MSCP land cover types that would be most likely to encompass the constituent elements of each Covered Species' habitat within the river reaches where each species is known or assumed to occur. Several sources of information, including published manuscripts, technical references, and the various documents/impact assessments developed as part of the LCR MSCP were used to determine the physical and biological attributes associated with each of the LCR MSCP land cover types that can reasonably be correlated to represent Covered Species habitat. Occupied southwestern willow flycatcher habitat within salt cedar is used to represent the extent of suitable Covered Species habitat present in salt cedar cover types. All other occupied southwestern willow flycatcher habitat is included within the other land cover types. Habitat models are based on the land cover types described in Section 3.4 of the LCR MSCP HCP and information used to construct the LCR MSCP GIS land cover database. The land cover type classification system used in the LCR MSCP is derived from previous classifications developed by Anderson and Ohmart (1984b), Younker and Anderson (1986), Salas et al. (1996), and Ogden Environmental and Energy Services (1998).

Species habitat models are presented in Table 1. Application of the habitat models produced the calculated extent of existing habitat for Covered Species by land cover type in river reaches 4 and 5 of the project area and is presented in Table 2. For each Covered Species, the existing distribution of habitat, assessment of impacts on Covered Species habitat, and assessment of expected outcomes of implementing the Covered Activities with conservation measures is based on application of these models.

**Table 1. Land cover types that provide habitat for Covered Species based on application of habitat models.**

i) Covered Species	Land Cover Types	Structural/Compositional Types
<b>Mammals</b>		
Western (desert) red bat <i>Lasiurus blossevillii</i>	Cottonwood-Willow	I, II
	Honey Mesquite	III
Western yellow bat <i>Lasiurus xanthinus</i>	Cottonwood-Willow	I, II
	Honey Mesquite	III
Colorado River cotton rat <i>Sigmodon arizonae plenus</i>	Marsh	I-VII
<b>Birds</b>		
Western least bittern <i>Ixobrychus exilis hesperis</i>	Marsh	I-VII
California black rail <i>Laterallus jamaicensis coturniculus</i>	Marsh	I-VII
Yuma clapper rail <i>Rallus longirostris yumanensis</i>	Marsh	I-VII
Western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	Cottonwood-Willow	I, II, III
	Salt Cedar	III
	Salt Cedar/Screwbean Mesquite	III
	Salt Cedar/Honey Mesquite	III
	Honey Mesquite	III
Southwestern willow flycatcher <i>Empidonax traillii extimus</i>	Cottonwood-Willow	I, III, IV
	Marsh	I, II, III, IV
	Salt Cedar	III, IV, V, VI
	Salt Cedar/Screwbean Mesquite	IV
	Salt Cedar/Honey Mesquite	IV
Elf owl <i>Micrathene whitneyi</i>	Cottonwood-Willow	I, II, III
	Salt Cedar/Screwbean Mesquite	III
	Salt Cedar/Honey Mesquite	III
	Honey Mesquite	III
Gilded flicker <i>Colaptes chrysoides</i>	Cottonwood-Willow	I, II, III
	Honey Mesquite	III
Gila woodpecker	Cottonwood-Willow	I, II, III, IV
	Salt Cedar	III, IV

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i) Covered Species	Land Cover Types	Structural/Compositional Types
<i>Melanerpes uropygialis</i>	Salt Cedar/Screwbean Mesquite	III, IV
	Salt Cedar/Honey Mesquite	III, IV
	Honey Mesquite	III, IV
Arizona Bell's vireo <i>Vireo bellii arizonae</i>	Cottonwood-Willow	III, IV
	Salt Cedar	III, IV
	Salt Cedar/Screwbean Mesquite	III, IV
	Salt Cedar/Honey Mesquite	III, IV
	Honey Mesquite	III, IV
Vermilion flycatcher <i>Pyrocephalus rubinus</i>	Salt Cedar/Screwbean Mesquite	III, IV
	Salt Cedar/Honey Mesquite	III, IV
	Honey Mesquite	III, IV
Sonoran yellow warbler <i>Dendroica petechia sonorana</i>	Cottonwood-Willow	I-VI
	Salt Cedar	III, IV, V, VI
	Salt Cedar/Screwbean Mesquite	IV
	Salt Cedar/Honey Mesquite	IV
Summer tanager <i>Piranga rubra</i>	Cottonwood-Willow	I,II
<b>Fish</b>		
Bonytail <i>Gila elegans</i>	Aquatic	River, Reservoir, and Backwater
Razorback sucker <i>Xyrauchen texanus</i>	Aquatic	River, Reservoir, and Backwater
Flannelmouth Sucker <i>Catostomus latipinnis</i>	Aquatic	River, Reservoir, and Backwater

**Table 2. Delineation of land cover type acreages that provide covered species habitat on the California side of river reaches 4 and 5. Extent of covered species habitat derived from application of habitat models.**

Land Cover Types	Structural/Compositional Types	Extent of Covered Species Habitat (ac)
<b>Riparian</b>		
Cottonwood-Willow	I-VI	626
Salt Cedar	III-VI	546

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Land Cover Types	Structural/Compositional Types	Extent of Covered Species Habitat (ac)
Salt Cedar/Screwbean Mesquite	III, IV	2,333
Salt Cedar/Honey Mesquite	III, IV	1,319
Honey Mesquite	III, IV	114
<b>Total Riparian Habitat</b>		<b>4,938</b>
<b>Marsh</b>		
Marsh	I-VII	2,927
<b>Total Marsh Habitat <sup>a</sup></b>		<b>2,927</b>
<b>Aquatic</b>		
Aquatic	River, Reservoir, and Backwater	6,389
<b>Total Aquatic Habitat <sup>b</sup></b>		<b>6,389</b>

Notes:

<sup>a</sup> Total marsh habitat delineated from Table 3-11 of the LCR MSCP HCP. Assumed 50% of total habitat in reaches 4 and 5 is in California.

<sup>b</sup> Total aquatic habitat delineated from Table 3-11 of the LCR MSCP HCP. Assumed 50% of total habitat in reaches 4 and 5 is in California.

## Analysis of Impacts and Level of Take

### A. Ongoing Flow-Related Covered Activities

The only "take" covered under the ongoing flow-related activity category is that which occurs as a result of entraining covered fish species (i.e., razorback sucker, bonytail, and flannelmouth sucker) at existing California diversion points (as identified in Appendix G of the LCR MSCP Appendices). For purposes of organization, the effects of entrainment caused by diversions associated with future flow-related Covered Activities are analyzed in this section, as well. With few exceptions, the majority of California's full annual entitlement is diverted at Metropolitan's Pumping Plant at Lake Havasu (Reach 3), PVID's diversions at Palo Verde Diversion Dam in Reach 4, and at Imperial Dam in Reach 5.

### ***Bonytail***

#### *Entrainment Resulting From Ongoing Flow-Related Diversions*

Based on known entrainment of razorback suckers in water diversions (Bureau of Reclamation 1996), diversions from the LCR are likely to entrain the bonytail. The potential for entrainment of bonytail has increased in recent years as a result of stocking

bonytail in LCR under federally authorized bonytail augmentation programs. There are relatively few diversions directly from the river segment of Reach 3, with the exception of the large diversion at Metropolitan's Whitsett Pumping Plant in Lake Havasu. The diversions from the river channel are small relative to river flow, and potential individual entrainment losses is assumed to be small; however, entrainment of bonytail could affect the population because of the low population numbers.

#### *Entrainment Resulting From Future Flow-Related Diversions*

Future diversions from Lake Havasu and the increased proportion of flow diverted in Reach 4 may increase entrainment losses of bonytail. Bonytail, especially larvae and juveniles, may be entrained in diversions. The number of fish entrained is a function of fish density within the area of diversion influence. Change in fish density within the area of influence is dependent on fish behavior and environmental conditions that are largely independent of the diversion (e.g., habitat abundance and quality). Any increase in entrainment of bonytail would likely be small.

Assuming that bonytail are reintroduced into Reaches 4 and 5, entrainment into the canals and other diversions (e.g., Senator Wash Reservoir) would result in impacts to the population. Canals at Headgate Rock Dam, Palo Verde Diversion Dam, and Imperial Dam divert most of the flow from the river. High diversions at Headgate Rock Dam and Palo Verde Diversion Dam would coincide with the potential occurrence of the planktonic larval life stage of bonytail in the summer, a period of potentially high entrainment vulnerability.

The number of bonytail that could be entrained is expected to increase with implementation of the LCR MSCP HCP Conservation Plan, which will include augmenting the existing population by stocking 620,000 bonytail in the LCR. Increasing the abundance of bonytail through LCR MSCP conservation measures to augment the existing population is expected to increase fish density and the number of fish potentially entrained in diversions.

Over the term of this Permit, it is estimated that entrainment of bonytail as a result of ongoing and future flow-related diversions will not exceed 1% percent of the projected bonytail population occurring in reaches 3, 4, and 5 following completion of bonytail augmentation measures required by this Permit. The projected bonytail population is derived from the most current population estimate of bonytail in reach 3 (3,000 fish), added to an expected 10% survivorship of the proposed 620,000 augmented fish.

## **Razorback Sucker**

### *Entrainment Resulting From Ongoing Flow-Related Diversions*

Diversions from the LCR may entrain razorback sucker. The potential for entrainment of razorback sucker has increased in recent years as a result of stocking razorback sucker in LCR under federally authorized razorback sucker augmentation programs. Razorback suckers have been observed in Senator Wash Reservoir, which may indicate entrainment with water diverted from the LCR. Razorback suckers observed in the reservoir, however, may also have been surviving fish from those stocked in the reservoir by CDFG between 1987 and 1990.

There are relatively few diversions directly from the river segment of Reach 3, with the exception of the large diversion at Metropolitan's Whitsett Pumping Plant in Lake Havasu. The diversions from the river channel are small relative to river flow, and potential individual entrainment losses is assumed to be small; however, entrainment of razorback sucker could affect the population because of the low population numbers.

Entrainment of razorback sucker from the river in Reaches 4 and 5 into the canals and other diversions (e.g., Senator Wash Reservoir) would result in impacts to the population. Canals at Headgate Rock Dam, Palo Verde Diversion Dam, and Imperial Dam divert most of the flow from the river. High diversions at Headgate Rock Dam and Palo Verde Diversion Dam would coincide with the potential occurrence of the planktonic larval life stage of razorback sucker in the summer, a period of potentially high entrainment vulnerability.

### *Entrainment Resulting From Future Flow-Related Diversions*

Future diversions from Lake Havasu and the increased proportion of flow diverted in Reach 4 may increase entrainment losses of razorback sucker. Razorback sucker, especially larvae and juveniles, may be entrained in diversions. The number of fish entrained is a function of fish density within the area of diversion influence. Change in fish density within the area of influence is dependent on fish behavior and environmental conditions that are largely independent of the diversion (e.g., habitat abundance and quality). Any increase in entrainment of razorback sucker would likely be small.

The increase in the proportion of flow diverted from the river with implementation of future flow-related covered activities could increase the number of razorback sucker entrained into the canals. Entrainment into the canals is assumed to result in an impact to the population. The level of entrainment of razorback suckers in Reach 5 is not

expected to increase from existing conditions because nearly all of the river flow in this reach is diverted at Imperial Dam, and diversions to Senator Wash Reservoir will not change.

The number of razorback suckers that could be entrained is expected to increase with implementation of the LCR MSCP HCP Conservation Plan, which will include augmenting the existing population by stocking 660,000 razorback suckers in the LCR. Increasing the abundance of razorback suckers through LCR MSCP conservation measures to augment the existing population is expected to increase fish density and the number of fish potentially entrained in diversions.

Over the term of this permit, it is estimated that entrainment of razorback sucker as a result of ongoing and future flow-related diversions will not exceed 1% percent of the projected razorback sucker population occurring in reaches 3, 4, and 5 following completion of razorback augmentation measures required by this permit. The projected razorback sucker population is derived from the most current population estimate of razorback suckers in reaches 3, 4, and 5 (8,600 fish), added to an expected 10% survivorship of the proposed 660,000 augmented fish.

### ***Flannelmouth Sucker***

Only Reach 3 supports flannelmouth sucker.

#### *Entrainment Resulting From Ongoing Flow-Related Diversions*

Diversions from the LCR may entrain flannelmouth sucker. There are relatively few diversions directly from the river segment of Reach 3, with the exception of the large diversion at Metropolitan's Whitsett Pumping Plant in Lake Havasu. The diversions from the river channel are small relative to river flow, and potential individual entrainment losses is assumed to be small; however, entrainment of flannelmouth sucker could affect the population because of the low population numbers.

#### *Entrainment Resulting From Future Flow-Related Diversions*

Future diversions from Lake Havasu may increase entrainment losses of flannelmouth sucker. Flannelmouth sucker, especially larvae and juveniles, may be entrained in diversions. The number of fish entrained is a function of fish density within the area of diversion influence. Change in fish density within the area of influence is dependent on fish behavior and environmental conditions that are largely independent of the diversion

(e.g., habitat abundance and quality). Any increase in entrainment of flannelmouth sucker would likely be small.

Over the term of this permit, it is estimated that entrainment of flannelmouth sucker as a result of ongoing and future flow-related diversions will not exceed 1% percent of the flannelmouth sucker population occurring in reach 3. The flannelmouth sucker population is derived from the most current population estimate of flannelmouth suckers in reach 3 (8,000 fish).

#### B. Future Flow-Related Covered Activities

Future flow-related activities by California agencies are diversions, discharges, and return flows through existing facilities on the LCR associated with a change in point of diversion of up to 0.8 million acre feet per year (maf) at the MWD Whitsett Pumping Plant diversion point at Lake Havasu. Effects to Covered Species from diverting the 0.8 maf associated with future flow-related activities are included within the diversion of the 4.4 maf analyzed above. California's 0.8 maf changes in point of diversion is part of the 1.574 maf change in point of diversion covered in the LCR MSCP HCP that will result in flow and ground water reductions in reaches 4 and 5. Implementation of the 1.574 maf change in point of diversion will have impacts on California Covered Species, however, only the impacts attributable to California's 0.8 maf change in point of diversion are covered by this permit. To calculate California's impacts caused by the 0.8 maf change in point of diversion, it is assumed that California's contribution to impacts is 50.8% of the total impacts caused by the 1.574 maf change in point of diversion.

Within the land cover types and when sufficient species habitat information is available, the changes in environmental conditions specific to each species' habitat are assessed to determine the affected habitat area. Limited information reduced the ability to precisely quantify the effects for many species. Where information is minimal, worst-case assumptions provide an overestimate of adverse effects on species and are assumed to err for the benefit of the Covered Species. For example, where information on specific environmental conditions that characterize habitat for a species is lacking, the assumed impact is the degradation or loss of all the acreage of the land cover types that are assumed to provide habitat for the species even though only a portion of the land cover type may provide habitat. Although this "worst-case" assumption may result in an overestimate of the actual effects on the species, it is based on the best available scientific information.

In the discussion that follows, the effects of California's 0.8 maf change in point of

diversion on Covered Species and their habitat (as defined by habitat models) in Reaches 4 and 5 is presented below.

*Reaches 4 and 5*

The 0.8 mafy change in point of diversion will cause a reduction in flows and lower groundwater levels in the river between Parker and Imperial Dams (Reaches 4 and 5). The reduction in flows and ground water elevations has the potential to reduce riparian, marsh, and aquatic land cover area that provides Covered Species habitat. This analysis of effects on backwater, marsh, and riparian land cover type habitat areas is used to assess the effects of changes in points of diversions on the extent of Covered Species habitats in Reaches 4 and 5. First, changes in environmental conditions that determine and characterize the Covered Species habitat are described. Second, the expected physical, chemical, and biological changes in the habitat provide the basis for assessing the effects on Covered Species.

The effects of California's 0.8 mafy change in point of diversion on Covered Species habitat in Reaches 4 and 5 are summarized in Table 3. Effects from California's 0.8 mafy change in point of diversion on Covered Species habitat constitutes 50.8% of the total effects on Covered Species habitat expected to occur from implementing the 1.574 mafy change in point of diversion covered under the LCR MSCP HCP.

**Table 3. Summary of estimated extent of Covered Species habitat affected in California with implementation of Lower Colorado River Multi-Species Conservation Program Habitat Conservation Plan (LCR MSCP HCP) 1.574 million acre feet per year (mafy) and California's 0.8 mafy portion of the 1.574 mafy change in point of diversion.**

Covered Species Habitat	Acres of Covered Species Habitat in Reaches 4 & 5 Affected by the LCR MSCP 1.574 mafy Change in Point of Diversion	Acres of Covered Species Habitat in Reaches 4 & 5 Affected by California's 0.8 mafy Portion of the 1.574 mafy Change in Point of Diversion
<b>Riparian Habitat</b>		
Cottonwood-Willow I-VI	626	318
Salt Cedar I-VI	546	277
Salt Cedar/Screwbean Mesquite III, IV	2,333	1,185
Salt Cedar/Honey Mesquite III, IV	1,319	670
Honey Mesquite III, IV	114	58
<b>Marsh Habitat</b>		
Marsh I-VII that provides Yuma clapper rail and western least bittern habitat	75	38

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Covered Species Habitat	Acres of Covered Species Habitat in Reaches 4 & 5 Affected by the LCR MSCP 1.574 mafy Change in Point of Diversion	Acres of Covered Species Habitat in Reaches 4 & 5 Affected by California's 0.8 mafy Portion of the 1.574 mafy Change in Point of Diversion
Marsh I-VII that provides California black rail habitat	28	14
Marsh I-VII that provides Colorado River cotton rat habitat	57 <sup>a</sup>	29 <sup>a</sup>
<b>Aquatic Habitat</b>		
River and backwater that provides razorback sucker and bonytail chub habitat	191	97

Notes:

<sup>a</sup> Affected Colorado River cotton rat habitat acreage is subsumed under the affected acreage of Yuma clapper rail and western least bittern, and California black rail habitat.

#### i. Effects on Riparian Habitat

The reduction in river flow attributable to future flow-related Covered Activities may lower groundwater levels under several thousand acres of lands adjacent to the river. Stands of riparian land cover type with the appropriate structure listed in Table 2 are assumed to provide habitat for the following species: southwestern willow flycatcher, western yellow-billed cuckoo, elf owl, gilded flicker, Gila woodpecker, vermilion flycatcher, Arizona Bell's vireo, Sonoran yellow warbler, summer tanager, western red bat, and western yellow bat ("Riparian Covered Species").

Reductions in river flow and surface area, and the lowering of groundwater elevations under areas supporting riparian land cover types in Table 2 ("Riparian Habitat") most likely will result in the degradation or loss of the vegetation or would remove or degrade environmental conditions that determine and characterize the constituent elements of habitat for Riparian Covered Species. Reductions in flow and groundwater elevations in Reaches 4 and 5 will result in the loss and/or degradation of: 1) 318 acres of cottonwood-willow I-VI, 2) 277 acres of salt cedar III-VI, 3) 1,185 acres of Salt Cedar/Screwbean Mesquite III, IV, 4) 670 acres of Salt Cedar/Honey Mesquite III, IV, and 5) 58 acres of Honey Mesquite III, IV that provide Riparian Covered Species habitat (Table 4). The types of effects to Riparian Habitat that could be expected by groundwater and river surface reductions are discussed in the following paragraphs followed by the expected effects to Riparian Covered Species.

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**Table 4. Summary of estimated extent of covered species habitat lost or degraded (impacts) in California as a result of California's 0.8 million acre feet per year (maf) change in point of diversion and non-flow-related covered activities**

Covered Species Habitat	Non-Flow Impacts (ac)	Change in Point of Diversion Impacts (ac)	Total Impacts on Species Habitat (ac)
<b>Riparian Habitat</b>			
Cottonwood-Willow I-VI	0	318	318
Salt Cedar I-VI	0	277	277
Salt Cedar/Screwbean Mesquite III, IV	0	1,185	1,185
Salt Cedar/Honey Mesquite III, IV	0	670	670
Honey Mesquite III, IV	0	58	58
<b>Total Riparian Habitat Impacts</b>			<b>2,508</b>
<b>Marsh Habitat</b>			
Marsh I-VII that provides Yuma clapper rail and western least bittern habitat	56	38	94
Marsh I-VII that provides California black rail habitat	28	14	42
Marsh I-VII that provides Colorado River cotton rat habitat	0	29 <sup>a</sup>	29 <sup>a</sup>
<b>Total Marsh Habitat Impacts</b>			<b>136</b>
<b>Aquatic Habitat</b>			
River and backwater that provides razorback sucker and bonytail chub habitat	0	97	97
<b>Total Aquatic Habitat Impacts</b>			<b>97</b>

Notes:

<sup>a</sup> Affected Colorado River cotton rat habitat acreage is subsumed under the affected acreage of Yuma clapper rail and western least bittern, and California black rail habitat.

***Cottonwood-Willow Riparian Habitats***

The extent and quality of cottonwood-willow land cover would be expected to decline relative to existing conditions. In the next 50 years, losses in the extent, vigor, and recruitment of cottonwood-willow land cover types, or further degradation of environmental conditions within existing stands are anticipated as a result of flow and groundwater elevation reductions downstream from Parker Dam. This would inhibit the future establishment of cottonwood-willow that could provide suitable nesting habitats when mature.

The extent of cottonwood-willow riparian habitats or the number of individual cottonwood and willow trees could be reduced along river segments of Reaches 4 and 5 because of mortality associated with lower groundwater levels. Presuming groundwater

elevations do not drop below the root zone, saplings and mature trees will likely survive the gradual change in groundwater level because their roots are expected to grow downward at rates commensurate with the rate of groundwater lowering (Jones and Stokes 2001). However, the potential growth rate of cottonwood and willow roots does not insure high success in response to rapidly declining water tables. This is because floodplain soils in the arid southwest often consist of coarse-textured alluvium that does not readily maintain the moist soil continuum necessary for inducing deeper rooting (Stromberg et al. 1992). Therefore, direct loss of existing cottonwood and willow trees attributable to ground water reductions cannot be precisely determined because baseline groundwater elevations are unknown and the reduction in groundwater elevation will occur over an extended period (i.e., 30 or more years) (Jones and Stokes 2001).

Groundwater reduction can cause direct loss or affect factors such as height, foliage area, canopy mortality, leaf size and number, and xylem water potential of cottonwoods and willows. Loss of tall and mature trees will result in limiting nesting sites for cavity and upper canopy nesting species. Loss of high foliage density in the upper canopy will affect midsummer canopy-nesting species by reducing shading and evapotranspiration that would buffer high midsummer ambient temperatures, thus possibly hindering nesting efforts of these species (Hunter et al. 1985, Hunter et al. 1987).

The ability for cottonwood-willow stands to naturally regenerate may be reduced where groundwater levels drop sufficiently to preclude future establishment and growth of seedlings. Studies from the Hassayampa River indicate that Fremont cottonwood seedlings naturally established on suitable surfaces within 0.2–1.0 meter (0.7–3.3 feet) of groundwater. The studies indicate that the highest success of seedling recruitment occurred where groundwater is within 0.2–0.4 meter (0.7–1.3 feet) of the ground surface (Stromberg 1993). Consequently, cottonwood-willow stands in locations where flow reductions drop groundwater levels below 1 meter (3 feet) from the soil surface during the growing season may no longer be able to regenerate. In addition, existing cottonwood-willow stands could be permanently lost to wildfires where groundwater levels drop sufficiently to preclude regeneration of burned stands. Reduced groundwater elevation may also increase the difficulty of future restoration of cottonwood-willow land cover.

Reduction in groundwater levels could also affect the composition of understory vegetation in cottonwood-willow stands (Stromberg et al. 1996). Studies along the Hassayampa and San Pedro Rivers show that streamside herbaceous vegetation was associated with mean groundwater depths of 0.30–0.45 meter (1.0–1.5 feet) (Richter 1993 and Stromberg et al. 1996). Where lower groundwater elevations affect the composition understory vegetation, micro-habitat conditions (e.g., higher temperature,

lower humidity), percent plant cover, and the type and biomass of invertebrate production in cottonwood-willow stands would be expected to change. Structure and food web support for Riparian Covered Species that forage on flying insects would be substantially reduced in cottonwood-willow stands that currently have saturated soils or pond water during some periods, but which would no longer have these conditions following a reduction in groundwater elevation.

### ***Salt Cedar Riparian Habitats***

With implementation of future flow-related activities, the quality of some saltcedar stands would be expected to decline relative to baseline conditions. Future flow-related activities could affect saltcedar land cover by lowering mean groundwater elevations, and by reducing the frequency of flood events in Reaches 4 and 5.

Lowered groundwater elevations could be sufficient to adversely affect micro-habitat conditions (e.g., higher temperature, lower humidity) and the type and biomass of invertebrate production in some saltcedar stands. Effects on micro-climate and food web support are likely to be greatest in saltcedar stands that currently have saturated soils or pond water during some periods, but which would no longer have these conditions following a reduction in groundwater elevation. Removing standing water and/or moist soils from a site may affect the abundance, distribution, occupancy, prey base, and nesting success of Riparian Covered Species.

### ***Honey Mesquite and Mesquite Mixed Riparian Habitats***

Mesquite owe their existence to shallow alluvial water tables (Stromberg 1993). Reduced instream flows and groundwater elevations in Reaches 4 and 5 could inhibit the future establishment of honey mesquite, and screwbean mesquite that could provide suitable nesting habitats when mature. In the next 50 years, losses in the extent, vigor, and recruitment of honey mesquite, screwbean mesquite along the LCR are anticipated as a result of lower surface and groundwater elevations downstream from Parker Dam (Jones and Stokes 2001).

The extent of honey mesquite and mesquite mixed riparian habitats or the number of individual mesquite trees could be reduced along river segments of Reaches 4 and 5 because of mortality associated with lower groundwater levels. Presuming groundwater elevations do not drop below the root zone, saplings and mature trees will likely survive the gradual change in groundwater level because their roots are expected to grow downward at rates commensurate with the rate of groundwater lowering (Jones and Stokes 2001). However, the high potential growth rate of mesquite roots does not insure high success in response to rapidly declining water tables. This is because

floodplain soils in the arid southwest often consist of coarse-textured alluvium that does not readily maintain the moist soil continuum necessary for inducing deeper rooting (Stromberg et al. 1992). Therefore, direct loss of existing mesquite trees attributable to ground water reductions cannot be precisely determined because baseline groundwater elevations are unknown and the reduction in groundwater elevation will occur over an extended period (i.e., 30 or more years) (Jones and Stokes 2001).

The ability for mesquite trees to naturally regenerate may be compromised where groundwater levels drop sufficiently to preclude future establishment and growth of seedlings. Floodplains where depth to the water table ranges from 1 to 2 m (3.3–6.6 feet) and in close proximity to the primary channel (less than 35 m [155 feet]) provide optimal conditions for mesquite recruitment (Stromberg et al. 1991, Stromberg 1993). Consequently, regeneration of mesquite in some stands could be adversely affected as a result of groundwater reductions. As a result, mesquite stands in locations where flow reductions drop groundwater levels below 2 m (6 feet) from the soil surface during the growing season may no longer be able to regenerate. In addition, existing mesquite and mesquite mixed stands or the number of individual mesquite trees could be permanently lost to wildfires where groundwater levels drop sufficiently to preclude regeneration of burned stands.

Water stress caused by further ground water reduction may cause substantial decline in the vegetative and reproductive productivity of mesquite (Mooney et al. 1977, Felker et al. 1983, Nilsen et al. 1984). Stromberg et al. (1996) found that small groundwater declines may affect factors such as size and productivity. As a result it would be expected to incur cascading effects on higher trophic levels, such decreased abundance of mesquite flowers and fruits followed by a reduction in insects and insectivores (Kingsolver et al. 1977, Simpson et al. 1977).

Reduction in flow and groundwater levels could also affect the tree species composition, structural characteristics, and composition of understory shrub and herbaceous plant associations in mesquite and mesquite mixed stands (Stromberg et al. 1991, Stromberg et al. 1996). Flow reductions may exacerbate flow buffering to the point where instream flows are no longer capable of flushing accumulated salts from many parts of the lower Colorado River bank. This greatly increases the likelihood that salts will accumulate to the extent that salinity will negatively affect establishment and growth rates of native riparian species (Briggs 1996). Pinckney (1992) noted in his review of revegetation projects along the lower Colorado River that most native riparian species of this region have low tolerances to salt. As a result, increased soil salinity would be expected to cause reduced recruitment and restricted plant growth affecting both plant species composition and structural characteristics within mesquite and mesquite mixed riparian habitat.

Moisture availability has strong influences on size and growth rate of mature mesquite (Stromberg 1993). Within riparian zones, several structural traits of mesquite stands including canopy height and vegetation volume, have been shown to vary continuously with depth to groundwater (Meinzer 1927, Stromberg et al. 1992, Stromberg 1993). Stromberg et al. (1996) found that small changes in groundwater decline may affect factors such as height, foliage area, canopy mortality, leaf size and number, and xylem water potential. Thus, continued groundwater declines would be expected to affect the health and structural characteristics of existing and new stands.

Groundwater declines are also expected to change the composition of understory shrub and herbaceous plant associations. Studies show that streamside herbaceous vegetation was associated with mean groundwater depths of 0.30–0.45 m (1.0–1.5 feet) (Richter 1993, Stromberg et al. 1996). In addition, lower groundwater elevations could affect the recruitment rates of all or some of the shrubby species, including arrow weed, quailbush, four-winged saltbush, allscale, wolfberry, or inkweed (Yunker and Andersen 1986). Because seedlings of some plant species can establish at lower groundwater elevations than seedlings of other species, lowering the groundwater elevation could change the composition of herbaceous and understory shrub vegetation in some existing and/or new stands over the long term. Where lower groundwater elevations affect the composition understory vegetation, microhabitat conditions (e.g. higher temperature, lower humidity), percent plant cover, and the type and biomass of invertebrate production in mesquite and mesquite mixed stands would be expected to change. Structure and food web support, in mesquite and mesquite mixed stands that currently support moist soil conditions (i.e. higher groundwater elevations, periodically inundated, etc.) during some periods, but which would no longer have these conditions following a reduction in flow and groundwater elevations, would be most affected (Jones and Stokes 2001). Moisture in the soils provides the proper humidity, ground cover, solar protection, and supports the diversity and abundance of prey species (e.g., insects). As such, changes in points of diversion may adversely affect nesting success and suitability of occupied habitat if groundwater and river surface elevations lower sufficiently to remove surface water or moist soil conditions.

In addition, groundwater and flow reduction may preclude the regeneration, impede the growth or growth rates, or cause a reduction in canopy vegetation volume of honey and screwbean mesquite, thereby changing both species composition and structural characteristics within stands. Groundwater reduction can cause direct loss or affect factors such as height, foliage area, canopy mortality, leaf size and number, and xylem water potential of honey and screwbean mesquite. Loss of tall and mature trees will result in limiting nesting sites for cavity and upper canopy nesting species. Loss of high foliage density in the upper canopy will affect midsummer canopy-nesting species by

reducing shading and evapotranspiration that would buffer high midsummer ambient temperatures, thus possibly hindering nesting efforts of these species (Hunter et al. 1985, Hunter et al. 1987). As a result this would affect nesting success and suitability of occupied habitat.

Implementation of Future Flow-related Covered Activities will have adverse impacts to the physical and biological characteristics of riparian habitat supported within plant communities dominated or co-dominated by mesquite land cover types. Based on the best available information, mesquite and mesquite mixed communities support habitat for the following species: Western yellow-billed cuckoo, Elf owl, gilded flicker, Gila woodpecker, Vermilion flycatcher, Arizona bell's vireo, Sonoran yellow warbler, Western red bat, and Western yellow bat. These species extensively use and depend on mesquite plant communities to fulfill critical life history requirements. The California side of the lower Colorado River lies at the western edge of the Elf owl, gilded flicker, Gila woodpecker, Vermilion flycatcher, Arizona bell's vireo, Sonoran Yellow warbler, Western red bat, and Western yellow bat geographic range. Consequently, the continued existence of these species in California is seriously threatened by further loss and/or degradation of breeding habitat located at the western edge of their range and represents a significant loss of habitat within California.

### ***Southwestern Willow Flycatcher***

Occupied southwestern willow flycatcher nesting habitat occurs along all reaches of the project area, and migrants are widespread in all reaches of the LCR (McKernan and Braden 2001). Habitats occupied by nesting southwestern willow flycatchers can vary from site to site based on the species composition of vegetation, elevation, patchiness, humidity, temperatures, standing water and soil moisture, proximity to suitable foraging areas, and other factors (USBR 2000, Jones & Stokes 2000, McKernan and Braden 2000). Occupied southwestern willow flycatcher habitat is defined as "a contiguous area with consistent physical and biotic characteristics where territorial males or pairs of flycatchers have been documented during previous breeding seasons (generally after June 15) at least once since 1996, assuming the habitat has not been degraded or otherwise altered in the interim; if a portion of the contiguous habitat is or was used, the entire contiguous area is considered occupied" (USBR 2000).

Future changes in points of diversion may adversely affect the southwestern willow flycatcher in reaches 4 and 5. Regionally significant occurrences of the southwestern willow flycatcher occur between Parker and Imperial Dams. Future flow and groundwater reductions may cause the loss of a large proportion of this regionally significant southwestern willow flycatcher population. In 2000, there were 13 pairs in

Reaches 4 and 5, and the majority of these pairs could be adversely affected due to loss of standing water or moist soils in their nesting territories. Of the 1,460 acres of occupied willow flycatcher habitat between Parker and Imperial Dams 909 acres are located within California (USFWS 2001). Removing standing water and/or moist soils from a site may affect the abundance, distribution, occupancy, prey base, and nesting success of southwestern willow flycatchers. Also, such changes may affect the future extent of suitable flycatcher migration habitat.

Changes in points of diversion will reduce instream flows and groundwater elevations in Reaches 4 and 5, which could inhibit the future establishment of cottonwoods and willows that could provide suitable southwestern willow flycatcher nesting habitats when mature. In the next 50 years, losses in the extent, vigor, and recruitment of cottonwood-willow land cover types along the LCR or further degradation of environmental conditions are anticipated as a result of lower surface and groundwater elevations downstream from Parker Dam.

Loss of habitat or degradation of environmental conditions within habitat will increase competition for limited nesting habitat and resources, forcing individuals to nest in suboptimal habitat. This may result in higher rates of mortality associated with predation, starvation, hatching failure, and adverse weather conditions. Defending a territory is also costly in terms of energy and time, and can interfere with courtship, mating, feeding, and rearing young, decreasing the probability of survival and decreasing reproductive success.

Structure and food web support, in riparian stands that currently support moist soil conditions (i.e. higher groundwater elevations, periodically inundated, etc.) during some periods, but which would no longer have these conditions following a reduction in flow and groundwater elevations, could be lost or substantially degraded (Jones and Stokes 2001). Moisture in the soils supports the diversity and abundance of prey species (e.g., insects) essential in supporting insectivores. Where lower groundwater elevations affect the composition understory vegetation, microhabitat conditions (e.g. higher temperature, lower humidity), percent plant cover, and the type and biomass of invertebrate production in riparian stands would be expected to degrade. Reductions in flow and ground water elevations could degrade the forage base reducing survival rates. The degradation of the food chain could result in starvation, increased vulnerability to disease and predation, increased chick death, and desertion.

Groundwater reduction can cause direct loss or affect factors such as foliage area, canopy mortality, leaf size and number, and xylem water potential of riparian forest. Loss of high foliage density in the canopy will affect midsummer nesting activities, by reducing shading and evapotranspiration that would buffer high midsummer ambient

temperatures. Environmental conditions within nesting habitat will be further degraded where lower groundwater elevations affect the composition understory vegetation, microhabitat conditions (e.g. higher temperature, lower humidity), and percent plant cover. Moisture in the soils provides the proper humidity, ground cover, and solar protection. Loss or degradation of high foliage density, understory vegetation, microhabitat conditions, or moisture in soil could result in higher mortality rates attributed to hatching failure, desertion, and adverse weather conditions (Hunter et al. 1985, Hunter et al. 1987).

### ***Western Yellow-Billed Cuckoo***

Occupied western yellow-billed cuckoo nesting habitat is present in Reaches 3, 4, and 5 of the project area. Because of its large extent and mosaic of riparian vegetation, the Bill Williams River NWR, adjacent to the LCR MSCP planning area, has historically been a stronghold for western yellow-billed cuckoos in the southwest, and it currently supports the largest population in western Arizona or southeastern California. Since 1996, nesting pairs have also been found along the LCR at Cibola NWR (Reach 4), Imperial NWR and Picacho State Recreation Area (Reach 5) (Haltermann pers. comm), and at Eherenberg (Reach 4).

Occupied western yellow-billed cuckoo habitats are present in these Reaches, and lowering of groundwater elevations as a result of changing points of diversion would likely adversely affect suitable western yellow-billed cuckoo habitat in Reaches 4 and 5. Lowering groundwater may affect occupied western yellow-billed cuckoo habitats at Cibola NWR and Eherenberg in Reach 4, and at Imperial NWR and Picacho State Recreation Area in Reach 5. If moist soils are removed from a site, it may affect the abundance, distribution, occupancy, prey base, and nesting success of western yellow-billed cuckoos there. Changes in points of diversion will reduce instream flows and groundwater elevations in Reaches 4 and 5, which could inhibit the future establishment of suitable western yellow-billed cuckoo nesting habitats. Also, such changes may affect the future extent of suitable cuckoo migration habitat.

Loss of habitat or degradation of environmental conditions within that habitat will increase competition for limited nesting habitat and resources, forcing individuals to nest in suboptimal habitat. This may result in higher rates of mortality associated with predation, starvation, hatching failure, and adverse weather conditions. Defending a territory is also costly in terms of energy and time, and can interfere with courtship, mating, feeding, and rearing young, decreasing the probability of survival and decreasing reproductive success.

Structure and food web support, in riparian stands that currently support moist soil conditions (i.e. higher groundwater elevations, periodically inundated, etc.) during some periods, but which would no longer have these conditions following a reduction in flow and groundwater elevations, could be lost or substantially degraded (Jones and Stokes 2001). Moisture in the soils supports the diversity and abundance of prey species (e.g., insects) essential in supporting insectivores. Where lower groundwater elevations affect the composition understory vegetation, microhabitat conditions (e.g. higher temperature, lower humidity), percent plant cover, and the type and biomass of invertebrate production in riparian stands would be expected to degrade. Reductions in flow and ground water elevations could degrade the forage base reducing survival rates. The degradation of the food chain could result in starvation, increased vulnerability to disease and predation, increased chick death, and desertion.

Groundwater reduction can cause direct loss or affect factors such as foliage area, canopy mortality, leaf size and number, and xylem water potential of riparian forest. Loss of high foliage density in the canopy will affect midsummer nesting activities, by reducing shading and evapotranspiration that would buffer high midsummer ambient temperatures. Environmental conditions within nesting habitat will be further degraded where lower groundwater elevations affect the composition understory vegetation, microhabitat conditions (e.g. higher temperature, lower humidity), and percent plant cover. Moisture in the soils provides the proper humidity, ground cover, and solar protection. Loss or degradation of high foliage density, understory vegetation, microhabitat conditions, or moisture in soil could result in higher mortality rates attributed to hatching failure, desertion, and adverse weather conditions (Hunter et al. 1985, Hunter et al. 1987).

In addition, groundwater and flow reduction may preclude the regeneration, or impede the growth or growth rates of cottonwoods, Goodding's willow, and honey and screwbean mesquite thereby changing both species composition and structural characteristics within forest stands. The loss of tall and mature trees will result in limiting nesting sites, especially for upper canopy and cavity nesting species. The reduction in growth or growth rates could affect foliage height diversity reducing the number of foraging layers and available nest sites. Loss of these habitat characteristics could increase competition for limited nesting sites, especially for upper canopy and cavity nesting species, forcing many individuals to nest in suboptimal habitat, which may result in higher rates of mortality associated with predation, starvation, hatching failure, and adverse weather conditions.

### *Elf Owl*

The elf owl is only known to nest in stretches of Reaches 3 and 4 of the project area. Because of its large extent and mosaic of riparian vegetation, the Bill Williams River NWR, adjacent to the LCR MSCP planning area, has been a stronghold for elf owls along the LCR. During 1987, elf owls were also found along the LCR at the Fort Mojave area, Headrock Gate Dam, Wilson Road 2 km east of highway 95, Waterwheel Camp 21 km north of Blythe, Aha Quin trailer park 18 km north of Blythe, near Ehrenberg, Walter's Camp and elsewhere in Cibola NWR (Reach 4) and Picacho State Recreation Area (Reach 5) (Halterman et al. 1989).

Changes in points of diversion may adversely affect the elf owl in reach 4. Effects of future flow-related activities on occupied and suitable nesting and migration habitats along the LCR may occur from reducing instream flows and lowering surface and groundwater elevations. Lowering groundwater elevations can adversely affect elf owls by causing direct loss of occupied or suitable nesting habitat. In addition to the potential for direct loss of nesting habitat, a loss of surface water or moist soil conditions associated with lowering groundwater elevations could also affect the abundance, distribution, occupancy, prey base, and nesting success of elf owls.

Changes in points of diversion will reduce instream flows and groundwater elevations in Reach 4, which could inhibit the future establishment of cottonwoods, willows, and mesquite that could provide suitable elf owl nesting habitats when mature. In the next 50 years, losses in the extent, vigor, and recruitment of cottonwood-willow and mesquite land cover along the LCR are anticipated because of lower surface and groundwater elevations downstream from Parker Dam.

Loss of habitat or degradation of environmental conditions within habitat will increase competition for limited nesting habitat and resources, forcing individuals to nest in suboptimal habitat. This may result in higher rates of mortality associated with predation, starvation, hatching failure, and adverse weather conditions. Defending a territory is also costly in terms of energy and time, and can interfere with courtship, mating, feeding, and rearing young, decreasing the probability of survival and decreasing reproductive success.

Structure and food web support, in riparian stands that currently support moist soil conditions (i.e. higher groundwater elevations, periodically inundated, etc.) during some periods, but which would no longer have these conditions following a reduction in flow and groundwater elevations, could be lost or substantially degraded (Jones and Stokes 2001). Moisture in the soils supports the diversity and abundance of prey species (e.g., insects) essential in supporting insectivores. Where lower groundwater elevations affect

the composition understory vegetation, microhabitat conditions (e.g. higher temperature, lower humidity), percent plant cover, and the type and biomass of invertebrate production in riparian stands would be expected to degrade. Reductions in flow and ground water elevations could degrade the forage base reducing survival rates. The degradation of the food chain could result in starvation, increased vulnerability to disease and predation, increased chick death, and desertion.

Groundwater reduction can cause direct loss or affect factors such as foliage area, canopy mortality, leaf size and number, and xylem water potential of riparian forest. Loss of high foliage density in the canopy will affect midsummer nesting activities, by reducing shading and evapotranspiration that would buffer high midsummer ambient temperatures. Environmental conditions within nesting habitat will be further degraded where lower groundwater elevations affect the composition understory vegetation, microhabitat conditions (e.g. higher temperature, lower humidity), and percent plant cover. Moisture in the soils provides the proper humidity, ground cover, and solar protection. Loss or degradation of high foliage density, understory vegetation, microhabitat conditions, or moisture in soil could result in higher mortality rates attributed to hatching failure, desertion, and adverse weather conditions (Hunter et al. 1985, Hunter et al. 1987).

In addition, groundwater and flow reduction may preclude the regeneration, or impede the growth or growth rates of cottonwoods, Goodding's willow, and honey and screwbean mesquite thereby changing both species composition and structural characteristics within forest stands. The loss of tall and mature trees will result in limiting nesting sites, especially for upper canopy and cavity nesting species. The reduction in growth or growth rates could affect foliage height diversity reducing the number of foraging layers and available nest sites. Loss of these habitat characteristics could increase competition for limited nesting sites, especially for upper canopy and cavity nesting species, forcing many individuals to nest in suboptimal habitat, which may result in higher rates of mortality associated with predation, starvation, hatching failure, and adverse weather conditions.

### ***Gilded Flicker***

The gilded flicker is declining in California because of the loss and degradation of mature riparian forests and saguaro along the LCR (Garrett and Dunn 1981; CDFG 1991; Rosenberg et al. 1991). Adjacent to the LCR MSCP planning area, the gilded flicker is still fairly common at Bill Williams River NWR, especially in adjacent desert uplands with saguaro. It is rare elsewhere, with small numbers persisting at Fort Mojave, the Colorado River Indian Reservation, Topock Marsh, Lake Havasu, near

Ehrenberg, between Imperial and Laguna Dams, and at Cibola and NWRs (McKernan and Braden 2001).

Changes in points of diversion may adversely affect the gilded flicker in Reaches 4 and 5. Effects of these activities would adversely affect the gilded flicker in Reaches 4 and 5 by reducing the extent of woody riparian land cover types or degrading environmental conditions within existing occupied sites used by the species. The reduction of instream flows and groundwater elevations could inhibit the future establishment of suitable gilded flicker nesting habitats in future years.

Loss of habitat or degradation of environmental conditions within habitat will increase competition for limited nesting habitat and resources, forcing individuals to nest in suboptimal habitat. This may result in higher rates of mortality associated with predation, starvation, hatching failure, and adverse weather conditions. Defending a territory is also costly in terms of energy and time, and can interfere with courtship, mating, feeding, and rearing young, decreasing the probability of survival and decreasing reproductive success.

Structure and food web support, in riparian stands that currently support moist soil conditions (i.e. higher groundwater elevations, periodically inundated, etc.) during some periods, but which would no longer have these conditions following a reduction in flow and groundwater elevations, could be lost or substantially degraded (Jones and Stokes 2001). Moisture in the soils supports the diversity and abundance of prey species (e.g., insects) essential in supporting insectivores. Where lower groundwater elevations affect the composition understory vegetation, microhabitat conditions (e.g. higher temperature, lower humidity), percent plant cover, and the type and biomass of invertebrate production in riparian stands would be expected to degrade. Reductions in flow and ground water elevations could degrade the forage base reducing survival rates. The degradation of the food chain could result in starvation, increased vulnerability to disease and predation, increased chick death, and desertion.

Groundwater reduction can cause direct loss or affect factors such as foliage area, canopy mortality, leaf size and number, and xylem water potential of riparian forest. Loss of high foliage density in the canopy will affect midsummer nesting activities, by reducing shading and evapotranspiration that would buffer high midsummer ambient temperatures. Environmental conditions within nesting habitat will be further degraded where lower groundwater elevations affect the composition understory vegetation, microhabitat conditions (e.g. higher temperature, lower humidity), and percent plant cover. Moisture in the soils provides the proper humidity, ground cover, and solar protection. Loss or degradation of high foliage density, understory vegetation, microhabitat conditions, or moisture in soil could result in higher mortality rates

attributed to hatching failure, desertion, and adverse weather conditions (Hunter et al. 1985, Hunter et al. 1987).

In addition, groundwater and flow reduction may preclude the regeneration, or impede the growth or growth rates of cottonwoods, Goodding's willow, and honey and screwbean mesquite thereby changing both species composition and structural characteristics within forest stands. The loss of tall and mature trees will result in limiting nesting sites, especially for upper canopy and cavity nesting species. The reduction in growth or growth rates could affect foliage height diversity reducing the number of foraging layers and available nest sites. Loss of these habitat characteristics could increase competition for limited nesting sites, especially for upper canopy and cavity nesting species, forcing many individuals to nest in suboptimal habitat, which may result in higher rates of mortality associated with predation, starvation, hatching failure, and adverse weather conditions.

### ***Gila Woodpecker***

The Gila woodpecker is declining in California because of the loss and degradation of mature riparian forests and saguaro along the LCR (Garrett and Dunn 1981; CDFG 1991; Rosenberg et al. 1991). They are now limited to several localities along the LCR between Needles and Yuma (CDFG 1991) in Reaches 3–6.

Changes in points of diversion may adversely affect the Gila woodpecker in Reaches 4 and 5. Effects of these activities would adversely affect the Gila woodpecker in Reaches 4 and 5 by reducing the extent of woody riparian land cover types or degrading environmental conditions within existing occupied sites used by the species. The reduction of instream flows and groundwater elevations could inhibit the future establishment of suitable Gila woodpecker nesting habitats in future years.

Loss of habitat or degradation of environmental conditions within habitat will increase competition for limited nesting habitat and resources, forcing individuals to nest in suboptimal habitat. This may result in higher rates of mortality associated with predation, starvation, hatching failure, and adverse weather conditions. Defending a territory is also costly in terms of energy and time, and can interfere with courtship, mating, feeding, and rearing young, decreasing the probability of survival and decreasing reproductive success.

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2001). Moisture in the soils supports the diversity and abundance of prey species (e.g., insects) essential in supporting insectivores. Where lower groundwater elevations affect the composition understory vegetation, microhabitat conditions (e.g. higher temperature, lower humidity), percent plant cover, and the type and biomass of invertebrate production in riparian stands would be expected to degrade. Reductions in flow and ground water elevations could degrade the forage base reducing survival rates. The degradation of the food chain could result in starvation, increased vulnerability to disease and predation, increased chick death, and desertion.

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### ***Vermilion Flycatcher***

Most nesting pairs of vermilion flycatchers remaining along the LCR occur at Bill Williams River Delta. Other areas where nesting flycatchers have been consistently observed in low numbers include the Blythe Golf Course, Clark Ranch, Parker Dam residences, and Willow Valley Estates (Rosenberg et al. 1991). Open water may be an important nesting habitat component because of the emergence of aquatic insects for

prey, as vermilion flycatchers are often observed foraging just above water (Ehrlich et al. 1988).

Changes in points of diversion may adversely affect the vermilion flycatcher in Reaches 4 and 5. Effects of these activities would adversely affect the vermilion flycatcher in Reaches 4 and 5 by reducing the extent of woody riparian land cover types or degrading environmental conditions within existing occupied sites used by the species. The reduction of instream flows and groundwater elevations could inhibit the future establishment of suitable vermilion flycatcher nesting habitats in future years.

Loss of habitat or degradation of environmental conditions within habitat will increase competition for limited nesting habitat and resources, forcing individuals to nest in suboptimal habitat. This may result in higher rates of mortality associated with predation, starvation, hatching failure, and adverse weather conditions. Defending a territory is also costly in terms of energy and time, and can interfere with courtship, mating, feeding, and rearing young, decreasing the probability of survival and decreasing reproductive success.

Structure and food web support, in riparian stands that currently support moist soil conditions (i.e. higher groundwater elevations, periodically inundated, etc.) during some periods, but which would no longer have these conditions following a reduction in flow and groundwater elevations, could be lost or substantially degraded (Jones and Stokes 2001). Moisture in the soils supports the diversity and abundance of prey species (e.g., insects) essential in supporting insectivores. Where lower groundwater elevations affect the composition understory vegetation, microhabitat conditions (e.g. higher temperature, lower humidity), percent plant cover, and the type and biomass of invertebrate production in riparian stands would be expected to degrade. Reductions in flow and ground water elevations could degrade the forage base reducing survival rates. The degradation of the food chain could result in starvation, increased vulnerability to disease and predation, increased chick death, and desertion.

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attributed to hatching failure, desertion, and adverse weather conditions (Hunter et al. 1985, Hunter et al. 1987).

In addition, groundwater and flow reduction may preclude the regeneration, or impede the growth or growth rates of cottonwoods, Goodding's willow, and honey and screwbean mesquite thereby changing both species composition and structural characteristics within forest stands. The loss of tall and mature trees will result in limiting nesting sites, especially for upper canopy and cavity nesting species. The reduction in growth or growth rates could affect foliage height diversity reducing the number of foraging layers and available nest sites. Loss of these habitat characteristics could increase competition for limited nesting sites, especially for upper canopy and cavity nesting species, forcing many individuals to nest in suboptimal habitat, which may result in higher rates of mortality associated with predation, starvation, hatching failure, and adverse weather conditions.

### ***Arizona Bell's Vireo***

The Bell's vireo is only known to nest in Reaches 3-5 of the project area. Occupied Bell's vireo habitat is present at Lake Havasu NWR (Reach 3), Cibola NWR and Ehrenberg (Reach 4), Picacho State Recreation Area (Reach 5), and adjacent to the LCR MSCP planning area at the Bill Williams River NWR. In the project area, suitable Bell's vireo nesting habitat is near water or areas that maintain surface water or moist soil conditions during the breeding season (Rosenberg et al. 1991).

Changes in points of diversion may adversely affect the Arizona Bell's vireo in Reaches 4 and 5. Effects of these activities would adversely affect the Arizona Bell's vireo in Reaches 4 and 5 by reducing the extent of woody riparian land cover types or degrading environmental conditions within existing occupied sites used by the species. The reduction of instream flows and groundwater elevations could inhibit the future establishment of suitable Arizona Bell's vireo nesting habitats in future years.

Loss of habitat or degradation of environmental conditions within habitat will increase competition for limited nesting habitat and resources, forcing individuals to nest in suboptimal habitat. This may result in higher rates of mortality associated with predation, starvation, hatching failure, and adverse weather conditions. Defending a territory is also costly in terms of energy and time, and can interfere with courtship, mating, feeding, and rearing young, decreasing the probability of survival and decreasing reproductive success.

Structure and food web support, in riparian stands that currently support moist soil conditions (i.e. higher groundwater elevations, periodically inundated, etc.) during some

periods, but which would no longer have these conditions following a reduction in flow and groundwater elevations, could be lost or substantially degraded (Jones and Stokes 2001). Moisture in the soils supports the diversity and abundance of prey species (e.g., insects) essential in supporting insectivores. Where lower groundwater elevations affect the composition understory vegetation, microhabitat conditions (e.g. higher temperature, lower humidity), percent plant cover, and the type and biomass of invertebrate production in riparian stands would be expected to degrade. Reductions in flow and ground water elevations could degrade the forage base reducing survival rates. The degradation of the food chain could result in starvation, increased vulnerability to disease and predation, increased chick death, and desertion.

Groundwater reduction can cause direct loss or affect factors such as foliage area, canopy mortality, leaf size and number, and xylem water potential of riparian forest. Loss of high foliage density in the canopy will affect midsummer nesting activities, by reducing shading and evapotranspiration that would buffer high midsummer ambient temperatures. Environmental conditions within nesting habitat will be further degraded where lower groundwater elevations affect the composition understory vegetation, microhabitat conditions (e.g. higher temperature, lower humidity), and percent plant cover. Moisture in the soils provides the proper humidity, ground cover, and solar protection. Loss or degradation of high foliage density, understory vegetation, microhabitat conditions, or moisture in soil could result in higher mortality rates attributed to hatching failure, desertion, and adverse weather conditions (Hunter et al. 1985, Hunter et al. 1987).

In addition, groundwater and flow reduction may preclude the regeneration, or impede the growth or growth rates of cottonwoods, Goodding's willow, and honey and screwbean mesquite thereby changing both species composition and structural characteristics within forest stands. The loss of tall and mature trees will result in limiting nesting sites, especially for upper canopy and cavity nesting species. The reduction in growth or growth rates could affect foliage height diversity reducing the number of foraging layers and available nest sites. Loss of these habitat characteristics could increase competition for limited nesting sites, especially for upper canopy and cavity nesting species, forcing many individuals to nest in suboptimal habitat, which may result in higher rates of mortality associated with predation, starvation, hatching failure, and adverse weather conditions.

### ***Sonoran Yellow Warbler***

Occupied Sonoran yellow warbler nesting habitat occurs along all reaches of the project area, and migrants are widespread in all reaches of the LCR. From 1996 to 1999, nesting by this subspecies was documented at Virgin River, Pahrangat, Meadow Valley,

Grand Canyon National Park, Topock Marsh, Topock Gorge, Lake Havasu, Bill Williams River NWR, Ehrenberg, Walker Lake, and Picacho State Recreation Area (McKernan and Braden 2001). This is a common nesting species along the Colorado River above Hoover Dam (Brown 1988; SWCA 1995; Sogge et al. 1998; Spence et al. 1998).

Changes in points of diversion may adversely affect the yellow warbler in Reaches 4 and 5. Effects of these activities would adversely affect the yellow warbler in Reaches 4 and 5 by reducing the extent of woody riparian land cover types or degrading environmental conditions within existing occupied sites used by the species. The reduction of instream flows and groundwater elevations could inhibit the future establishment of suitable yellow warbler nesting habitats in future years

Loss of habitat or degradation of environmental conditions within habitat will increase competition for limited nesting habitat and resources, forcing individuals to nest in suboptimal habitat. This may result in higher rates of mortality associated with predation, starvation, hatching failure, and adverse weather conditions. Defending a territory is also costly in terms of energy and time, and can interfere with courtship, mating, feeding, and rearing young, decreasing the probability of survival and decreasing reproductive success.

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In addition, groundwater and flow reduction may preclude the regeneration, or impede the growth or growth rates of cottonwoods, Goodding's willow, and honey and screwbean mesquite thereby changing both species composition and structural characteristics within forest stands. The loss of tall and mature trees will result in limiting nesting sites, especially for upper canopy and cavity nesting species. The reduction in growth or growth rates could affect foliage height diversity reducing the number of foraging layers and available nest sites. Loss of these habitat characteristics could increase competition for limited nesting sites, especially for upper canopy and cavity nesting species, forcing many individuals to nest in suboptimal habitat, which may result in higher rates of mortality associated with predation, starvation, hatching failure, and adverse weather conditions.

### ***Summer Tanager***

Summer tanagers nest primarily in tall cottonwood-willow forests along rivers and streams. In the project area, well-developed stands of cottonwood-willow (e.g., structural types I and II) can support 20–30 birds per 40 ha (100 ac) (Rosenberg et al. 1991).

Changes in points of diversion may adversely affect the summer tanager in Reaches 4 and 5. Effects of these activities would adversely affect the summer tanager in Reaches 4 and 5 by reducing the extent of woody riparian land cover types or degrading environmental conditions within existing occupied sites used by the species. The reduction of instream flows and groundwater elevations could inhibit the future establishment of suitable summer tanager nesting habitats in future years.

Loss of habitat or degradation of environmental conditions within habitat will increase competition for limited nesting habitat and resources, forcing individuals to nest in suboptimal habitat. This may result in higher rates of mortality associated with predation, starvation, hatching failure, and adverse weather conditions. Defending a territory is also costly in terms of energy and time, and can interfere with courtship, mating, feeding, and rearing young, decreasing the probability of survival and decreasing reproductive success.

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In addition, groundwater and flow reduction may preclude the regeneration, or impede the growth or growth rates of cottonwoods, Goodding's willow, and honey and screwbean mesquite thereby changing both species composition and structural characteristics within forest stands. The loss of tall and mature trees will result in limiting nesting sites, especially for upper canopy and cavity nesting species. The reduction in growth or growth rates could affect foliage height diversity reducing the number of foraging layers and available nest sites. Loss of these habitat characteristics could increase competition for limited nesting sites, especially for upper canopy and cavity nesting species, forcing many individuals to nest in suboptimal habitat, which may result in higher rates of mortality associated with predation, starvation, hatching failure, and adverse weather conditions.

### ***Western Red Bat***

The western red bat is migratory but may be a year-round resident throughout the project area, particularly along the lower reaches of the LCR. Known roosts include tree foliage of cottonwood and other riparian trees, leafy shrubs, and herbs.

Changes in points of diversion may adversely affect the western red bat in Reaches 4 and 5. Lowering of groundwater elevations could reduce the extent of existing cottonwood-willow land cover. Lowering of groundwater elevations could change the microclimate conditions and the extent of cottonwood-willow and other woody riparian land cover types used by western red bat for roosting and foraging. The existing extent of cottonwood-willow land cover could be reduced in the long-term if groundwater elevations are not sufficient to allow regeneration of existing stands. Depending on the type of riparian vegetation that would replace lost stands, these effects could result in a reduction in the number and abundance of trees suitable for roosting and in the diversity of insect prey available to this species for food, with potential adverse effects on this bat's reproductive capacity and survival.

### ***Western Yellow Bat***

The western yellow bat is migratory but is likely a year-round resident along all reaches of the Colorado River within the project area. The distribution of this species is not well known, but it has been found in association with Washington fan palms at Yuma and in broad-leaved riparian areas along the Bill Williams River (Hoffmeister 1986, AGFD 1996a). It is expected to occur at locations where palms have been planted along the Colorado River (Cockrum et al. 1996). Yellow bats have also been reported roosting in introduced palms at Lake Havasu City (Brown 1996).

Changes in points of diversion may adversely affect the western yellow bat in Reaches 4 and 5. Lowering of groundwater elevations could reduce the extent of existing cottonwood-willow land cover. Lowering of groundwater elevations could change the microclimate conditions and the extent of cottonwood-willow and other woody riparian land cover types used by western yellow bat for roosting and foraging. The existing extent of cottonwood-willow land cover could be reduced in the long-term if groundwater elevations are not sufficient to allow regeneration of existing stands. Depending on the type of riparian vegetation that would replace lost stands, these effects could result in a reduction in the number and abundance of trees suitable for roosting and in the diversity of insect prey available to this species for food, with potential adverse effects on this bat's reproductive capacity and survival.

In addition, lowered groundwater elevations could result in loss of backwater marsh and

open water areas that support large number of insects used by these bats for foraging.

## ii. Effects on Marsh Habitat

Marsh is present in all river reaches of the project area and provides habitat for the Yuma clapper rail, California black rail, western least bittern, and Colorado River cotton rat ("Marsh Covered Species"). Marsh vegetation grows:

- along the margins of isolated and connected backwaters, the main and side channels of the LCR, and reservoir coves;
- behind dams on the mainstem of the river;
- on wildlife refuges that are managed to maintain marsh; and
- in drains and canals that maintain sufficient water to support the establishment and growth of emergent vegetation.

Based on supporting hydrology, two types of marsh are present in the project area: 1) marshes that are directly connected to the river or that are groundwater dependent; and 2) marshes that have been formed by reservoirs or impoundments (e.g., Lake Mead, Lake Havasu, Mittry Lake) (Bureau of Reclamation 1996). The frequency and rate of reservoir fluctuations will be similar to baseline conditions, so future flow-related activities will not cause effects to marshes supported by reservoirs.

The quality and extent of some marsh land cover in the project area are expected to decline relative to existing conditions with implementation of future flow-related Covered Activities. Future flow-related Covered Activities will result in the degradation or loss of emergent aquatic vegetation or would remove or degrade environmental conditions that determine and characterize the constituent elements of habitat for Marsh Covered Species. Reductions in flow, river surface area, and groundwater levels in Reaches 4 and 5 will result in the loss of 38 acres of marsh that provides Yuma clapper rail and western least bittern habitat, 14 acres of marsh that provides California black rail habitat, and 29 acres of Colorado River cotton rat habitat (subsumed under the Yuma clapper rail, western least bittern, and California black rail habitat) (Table 4). The types of effects that could be expected if groundwater and river surface elevations are lowered sufficiently include:

- a change in marsh plant composition (e.g., replacement of cattail by common reed);
- a conversion of marsh land cover to woody riparian land cover types;
- an increase in plant density and extent, resulting in the loss of open water;
- a change in marsh function (e.g., change in invertebrate communities, species

- composition, or production); and
- desiccation of emergent vegetation in drains and canals if water conveyed through a drain or canal is not sufficient to maintain the vegetation.

An increase in the range of daily fluctuations in surface water elevations in marshes with changes in points of diversion also could affect the quality of habitat provided for some Marsh Covered Species (e.g., lower water levels could reduce the availability of cover and food for Yuma clapper rails) (U.S. Fish and Wildlife Service 2001).

### ***Yuma Clapper Rail***

Marshes that have developed with construction of reservoirs have created substantial areas of habitat for the Yuma clapper rail (Rosenberg et al. 1991), and occupied nesting habitat is present in Reach 1 and Reaches 3–7. Since 1996, rails have been found along the LCR at the Virgin River Delta and Las Vegas Wash (Reach 1), Havasu NWR and the Bill Williams Delta (Reach 3), Cibola NWR (Reach 4), Picacho State Recreation Area and Imperial NWR (Reach 5), and Mittry Lake (Reach 6) (McKernan and Braden 1999, USFWS 2001).

Changes in points of diversion may adversely affect the Yuma clapper rail in Reaches 4 and 5. Lowering groundwater elevations will affect Yuma clapper rail habitat that is dependent on river stage elevation and managed wetlands. Lowering groundwater elevations could cause direct loss of these habitats through desiccation, fragmentation, or severe reduction in area of habitat patches. Lowered groundwater elevations could also make it more difficult in the future to restore habitat by providing surface water in marshes that are structurally suitable, but that lack surface water during the breeding season. Marshes formed by reservoirs (i.e., Cibola NWR [Reach 4], and Imperial NWR [Reach 5]) will not be affected by changes in river stage. Effects of lowering groundwater elevations on occupied habitats would vary, depending on bank and underwater topography, water levels, water management policy for wildlife, and rates of changes in groundwater elevations.

Changes in points of diversion will also reduce instream flows and surface water elevations in Reaches 4 and 5, which could inhibit the future establishment or maintenance of marsh outside of the channel and backwater areas.

### ***California Black Rail***

Marshes that have developed with construction of reservoirs have created substantial areas of habitat for California black rail (Rosenberg et al. 1991). Occupied nesting habitat is present in Reaches 3–6 of the LCR. Black rails have been observed at the

Bill Williams River Delta (Reach 3), Cibola NWR (Reach 4), Imperial NWR (Reach 5), and Mittry Lake (Reach 6) (Rosenberg et al. 1991). Annual fluctuation in water levels, shallow water depth, and high-stem densities are important factors in determining habitat suitability for black rails (Eddleman et al. 1994, Rosenberg et al. 1991).

Changes in points of diversion may adversely affect the California black rail in Reaches 4 and 5. Lowering groundwater elevations will affect suitable habitat that is dependent on river stage elevation and managed wetlands. Lowering groundwater elevations could cause direct loss of these habitats through desiccation, fragmentation, or severe reduction in area of habitat patches. Lowered groundwater elevations could also make it more difficult in the future to restore habitat by providing surface water in marshes that are structurally suitable, but that lack surface water during the breeding season. Marshes formed by reservoirs (i.e., Cibola NWR [Reach 4], and Imperial NWR [Reach 5]) will not be affected by changes in river stage. Effects of lowering groundwater elevations on occupied habitats would vary, depending on bank and underwater topography, water levels, water management policy for wildlife, and rates of changes in groundwater elevations.

Changes in points of diversion will also reduce instream flows and surface water elevations in Reaches 4 and 5, which could inhibit the future establishment or maintenance of marsh outside of the channel and backwater areas.

#### ***Western Least bittern***

Marshes that have developed with construction of reservoirs have created substantial areas of habitat for western least bitterns (Rosenberg et al. 1991). Occupied least bittern habitat is present in Reaches 1, 3, 4, 5, 6, and 7. Relatively large numbers of western least bitterns are present at Topock Marsh.

Changes in points of diversion may adversely affect the western least bittern in Reaches 4 and 5. Lowering groundwater elevations will affect suitable habitat that is dependent on river stage elevation and managed wetlands. Lowering groundwater elevations could cause direct loss of these habitats through desiccation, fragmentation, or severe reduction in area of habitat patches. Lowered groundwater elevations could also make it more difficult in the future to restore habitat by providing surface water in marshes that are structurally suitable, but that lack surface water during the breeding season. Marshes formed by reservoirs (i.e., Cibola NWR [Reach 4], and Imperial NWR [Reach 5]) will not be affected by changes in river stage. Effects of lowering groundwater elevations on occupied habitats would vary, depending on bank and underwater topography, water levels, water management policy for wildlife, and rates of changes in groundwater elevations.

Changes in points of diversion will also reduce instream flows and surface water elevations in Reaches 4 and 5, which could inhibit the future establishment or maintenance of marsh outside of the channel and backwater areas.

### ***Colorado River cotton rat***

The Colorado River cotton rat inhabits narrow bands of mesic herbaceous vegetation along the Colorado River in Reaches 3 and 4 of the LCR from Topock Marsh to Ehrenberg (Hoffmeister 1986). The subspecies is also found in association with irrigated croplands in some areas (Hoffmeister 1986). Trapping success for this subspecies occurs most often in areas dominated by common reed (Zimmerman pers. comm.).

Changes in points of diversion may adversely affect the Colorado River cotton rat. These activities could result in the loss of occupied habitat if river stage and groundwater elevations drop sufficiently to reduce the extent of mesic herbaceous vegetation associated with backwaters and marshes.

### iii. Effects on Aquatic Habitat

Reservoirs, river, and backwater areas ("Aquatic Habitat") provide habitat for the razorback sucker and bonytail. Future changes in points of diversion will cause a change on aquatic environments and affect water depth, river surface area, water temperature, and contaminant concentration. Reductions in flow, water depth, river surface area in Reaches 4 and 5 will result in the loss of 97 acres of razorback sucker and bonytail habitat (Table 4). Although the bonytail is known only to exist in the mainstem and connected backwaters in Reach 3 and High Levee Pond in Reach 4, it may be reintroduced into Reaches 4 and 5 in future years under the LCR MSCP or other programs.

A qualitative assessment of potential effects from implementing changes in points of diversion is discussed for selected environmental conditions followed by the expected effects to razorback sucker and bonytail chub.

### *Reservoirs*

Future flow-related activities will not measurably affect reservoir conditions in Reach 4 and 5.

### *River*

The river edge, riffles, and side channels may be substantially affected by the future flow-related Covered Activities. Depending on site-specific channel morphology, reduced depth in association with ongoing daily flow fluctuation could affect stranding of fish and desiccate fish eggs and aquatic organisms in or on the substrate. The level of existing stranding and desiccation and how flow variability at a lower surface elevation interacts with channel morphology are currently unknown. However, the reduced river depth, in combination with ongoing daily flow fluctuation, could increase stranding losses and desiccation relative to the existing condition.

The reduction in flow with implementation of Covered Activities is not expected to measurably affect water temperature. Given that variability in reservoir storage and water surface elevation would be the same as for existing conditions for Lake Havasu, the temperature of the discharge from Parker Dam with implementation of future flow-related covered activities would be similar to temperature for existing conditions. Lower flow with implementation of future flow-related Covered Activities would not affect downstream water temperatures because temperatures reach ambient conditions in the pool created by Headgate Rock Dam.

#### *Backwater*

Open water and emergent vegetation components of backwaters provide habitat for the Yuma clapper rail, western least bittern, California black rail, bonytail, and razorback sucker. The level of effect of flow-related Covered Activities on backwaters varies, depending on the connection to the river. A reduction in river flow would affect backwater water depth, surface area, flow continuity, and contaminant concentration. The reduced depth of connected backwaters could increase stranding mortality for fish and desiccate aquatic organisms in and on the substrate within the affected backwaters. Backwaters that are directly connected to the river are more sensitive to river flow changes than are backwaters dependent on groundwater elevation only. For connected backwaters, the additional temporary reduction in depth and surface area associated with daily minimum flows could increase stranding losses, displacement of small juveniles from nursery habitat and cover, and desiccation of aquatic organisms and fish eggs relative to the existing condition.

#### **Razorback Sucker**

Implementation of changes in points of diversion are likely to adversely affect razorback sucker in Reaches 4 and 5, including created habitat at High Levee Pond. Reduced flow in Reaches 4 and 5 could reduce spawning and rearing habitat availability, increase stranding losses, and increase contaminant concentrations that could adversely affect survival, growth, and reproduction.

Razorback suckers require clean gravel in shallow areas of quiet water for spawning during January through April/May (Langhorst and Marsh 1986). Lower river surface elevations relative to baseline conditions would increase the potential to expose spawning habitat and desiccate exposed eggs. Reduced frequency and duration of spawning habitat availability may reduce the frequency of individual spawning success. Reduced spawning habitat availability may adversely affect the success of razorback sucker spawning activities, further contributing to conditions that currently are insufficient to sustain razorback sucker population abundance (USFWS 2001).

Larvae and juvenile razorback sucker use protected warm and shallow water that is generally more productive than deeper areas. Lower water levels may reduce the frequency and duration of rearing habitat availability (USFWS 2001). Connected backwaters and low velocity channel types, such as pool edges and side channels, provide rearing habitat for larval and juvenile razorback sucker. Stocked razorbacks show a preference for backwaters over the main channel habitats (Gurtin and Bradford 2000). Backwaters are warmer and more productive than the main river channel, potentially supporting faster growth rates. In addition, backwaters with emergent vegetation provide cover and potential refuges from predators. Reduced flow, and subsequent shallower depth, could reduce rearing habitat area in the river and backwaters. Reduced flow may also increase stranding losses where daily flow variability isolates and subsequently desiccates occupied habitat.

Reduction of instream flows and surface elevations may also affect razorback sucker habitat. Habitat conditions for non-native fish species could improve as a result of reduced periods of high turbidity. Access to temporary refuge from predation and feeding areas provided by temporarily inundated edge during high flows may also be reduced. The loss of habitat and increased predation and competition by non-native species could have an adverse effect on razorback sucker.

Reduced river flow with implementation of Covered Activities could also affect razorback sucker and their created habitat in High Levee Pond. Lower river surface elevation could reduce flow through the created habitat, resulting in reduced habitat area and adversely affecting water quality. Reduced water surface elevation in the created habitat, depending on the time of year, could directly reduce spawning and rearing habitat availability. In addition, lower water surface elevation could promote establishment of marsh plant species. The establishment of emergent marsh could permanently reduce available spawning and rearing habitat area. Effects on water quality are difficult to predict. Stagnation in the created habitat, combined with increased nutrient levels concentrated as surface area is reduced, could reduce

dissolved oxygen to levels detrimental to incubating eggs and rearing larvae. Recruitment success could be reduced.

Environmental conditions in the reservoirs behind Palo Verde Diversion Dam, Headgate Rock Dam, Imperial Dam, and in Senator Wash Reservoir would be relatively unchanged. Implementation of changes in points of diversion would not increase adverse effects on razorback suckers and their habitat in the reservoirs.

### ***Bonytail***

Bonytail have been extirpated from all riverine areas of the LCR (HCP, Chapter 2). Bonytail occur in Lake Mohave and are likely present in Lake Havasu. Designated critical habitat for bonytail extends from Hoover Dam to Parker Dam (Reaches 2 and 3), excluding the river segment from Parker Dam to the northern boundary of Havasu NWR.

Effects of implementing changes in points of diversion described for razorback sucker are assumed to apply to bonytail if reintroduced to Reaches 4 and 5. Reduced river flow would also affect bonytail and their created habitat in High Levee Pond in the same manner as described for razorbacks.

### **C. Non-Flow-Related Covered Activities**

#### *Effects of PVID and BWD Non-Flow-Related Covered Activities*

Non-flow-related activities associated with the daily routine operation of PVID and BWD existing water diversion and conveyance facilities include: 1) removing silt deposits, chaining, and repairing eroded sections along 313 miles of canals; and 2) periodic chaining or dredging of 172 miles of drains to maintain flow capacity. PVID's and BWD's non-flow-related covered activities will result in loss and/or degradation of submerged aquatic and/or emergent aquatic vegetation, which will affect Marsh Covered Species and their habitat within the footprint of these activities. Annual removal of up to 42 acres of emergent aquatic vegetation that provides habitat for Marsh Covered Species will be conducted in different locations. Clearing of up to 42 acres of Marsh Covered Species habitat may have temporary impacts since vegetation is expected to reestablish within two years along the cleared portions of the drains and canals.

The primary impact mechanisms for non-flow-related activities are physical and biological disturbance. Physical disturbance is the removal or displacement of vegetation, topsoil, substrate, or overburden or the placement of topsoil, substrate,

spoils, processed waste, or other material. The physical disturbance associated with non-flow-related Covered Activities that could affect Marsh Covered Species primarily could result from operation of equipment to periodically remove (e.g., dredging) marsh vegetation from drains. Physical disturbance usually results from activities with a specific footprint, where the disturbance occurs within a specifiable area and time frame. The extent of species habitat affected can generally be quantified before the occurrence of the activity. Operation of equipment to implement the non-flow-related activities described above will result in the temporary removal of existing habitat for Marsh Covered Species. In addition to direct effects on environmental conditions, activities causing physical disturbance potentially introduce contaminants into the air, soil, and water. Potential contaminants include fertilizers, pesticides, paint, and petroleum products. The introduction of contaminants generally occurs during ongoing disturbance, such as occurs with construction and maintenance activities. Activities at intervals shorter than 1 year that introduce contaminants potentially have adverse effects on survival and growth, cumulatively affecting abundance, distribution, and production of species populations.

Non-flow-related activities would result in biological disturbance - the intentional or unintentional removal or displacement of Covered Species. Biological disturbances associated with these activities could be manifested in the location where the activities are undertaken or on adjacent lands. Biological disturbance may be temporary or permanent and includes effects on behavior. For example, operation of equipment in habitat occupied by Marsh Covered Species could cause direct mortality. In addition, noise and visual disturbances associated with operation of equipment could cause Marsh Covered Species to move from the area of disturbance which may result in nest abandonment, or predation.

#### *Effects of MWD, PVID, and IID Non-Flow-Related Covered Activities*

Non-flow-related activities include periodic maintenance of pumps, valves and gates, cleaning and repair/replacement of trash racks, and repair and replacement of motors at MWD, PVID, and IID existing diversion facilities. Bankline stabilization (e.g., through placement of rip rap) may also occur. Non-flow-related activities may result in temporary displacement of individual bonytail, razorback sucker, and flannelmouth sucker ("Aquatic Covered Species"). Biological disturbances associated with these activities could be manifested in the location where the activities are undertaken or in adjacent habitat areas. Biological disturbance may be temporary or permanent and includes effects on behavior and habitat use patterns. For example, although it is unlikely, cleaning and repair/replacement of trash racks when Aquatic Covered Species are present could cause direct mortality. In addition, noise and visual disturbances

associated with operation of equipment may alter habitat use patterns and cause them to move from the area of disturbance, which could result in higher rates of predation.

#### D. Hydroelectric Power Covered Activities

Hydroelectric power activities covered by this permit include only the contracting for, ordering of, and scheduling of hydroelectric power generated at the federally operated dams along the Colorado River (e.g., Hoover Dam, Davis Dam, and Parker Dam) by California hydroelectric power contract holders. Electrical power generation itself is not a Covered Activity. Electrical power generation and the take of Covered Species resulting from hydropower generation (e.g. fish mortality from passing through the generator turbines) are not covered by this permit.

Existing daily fluctuations resulting from the contracting for, ordering of, and scheduling of hydroelectric power generated at the federally operated dams along the Colorado River will continue to occur over the term of the permit.

There is a small likelihood that existing and future water-level fluctuations resulting from the contracting for, ordering of, and scheduling of hydroelectric power will strand bonytail or razorback suckers. The incised nature of much of the river channel does not allow for the shallow side channels that pose the highest risk. Gravel and sand banks and bars in the channel are surrounded by deep water and fish in the vicinity can easily access these safe areas. Use of shallow gravel banks for spawning does have a risk of desiccation of eggs, and there is some degree of risk to backwater nursery habitats. However, there are considerable areas of gravel banks and backwaters that remain submerged even under the lowest water levels, and provide suitable spawning and nursery habitats. There is a risk of fish using shallow areas that could become exposed due to water level fluctuations that translates into the potential for incidental take. Based on the analysis above, this amount of take is likely to be small.

#### **Effective date and expiration date of permit:**

This permit shall be executed in duplicate original form and shall become effective between the Department and each permittee once a duplicate original is acknowledged by that applicant (see below) and returned to the Department. Unless renewed by the Department, this permit's authorization to take the Covered Species shall expire on April 30, 2055. In the event the Permittees apply to renew this permit, the Department shall take into consideration and give credit for all of the Conditions of Approval in this permit.

**Incidental take authorization:**

The Department authorizes the Permittees, their employees, contractors and agents to take Covered Species incidentally in carrying out the project, subject to the limitations described in this section and the conditions of approval identified below. This permit does not authorize any intentional take of Covered Species, take of Covered Species from activities outside the scope of the project as described above, or take of Covered Species resulting from a permit violation.

The permit authorizes the incidental take of each Covered Species that is currently listed as a threatened or endangered species pursuant to CESA, or is a candidate for such listing. For any Covered Species that is not listed or a candidate for listing under CESA at the time this permit is issued ("unlisted Covered Species"), incidental take will be authorized as of the date the species is accepted as a candidate species pursuant to Fish and Game Code section 2074.2, or is listed as threatened or endangered pursuant to Fish and Game Code section 2076.5, provided the Department confirms in writing that substantial evidence demonstrates the permit continues to meet the standards in Fish and Game Code section 2081(b) and (c), and in the California Code of Regulations, Title 14, section 783.4 for that species. In the event the Department confirms there is evidence demonstrating the standards are still being met, no amendment of the permit will be required and incidental take of the previously unlisted Covered Species is authorized by this permit. If the Department cannot confirm that permit issuance standards are still being met, Permittees will need to apply for an amendment to this permit or for a new or amended permit if it needs to obtain take authorization for the previously unlisted Covered Species. In considering such an application, the Department will accept and give due consideration to the minimization and mitigation measures in this permit, and will make reasonable efforts to review and process the application to ensure, to the extent it can consistent with CESA, that take authorization for the previously unlisted Covered Species is provided in a timely manner.

**Fully protected species****Section 2081.7 Finding - Fully protected species**

Section 2081.7 of the Fish and Game Code allows the Department to authorize the take of fully protected species for impacts attributable to the QSA if certain conditions are met. The QSA legislation defines QSA broadly to include "any QSA-related program that delivers water at the intake of the Metropolitan Water District of Southern California's Colorado River Aqueduct." (Stats. 2002, ch. 617, §1(a).) The Department

may authorize the take of fully protected species for impacts to "...the quantity and quality of water flowing in the Colorado River, the habitat sustained by those flows, and the collection of that water for delivery to authorized users." (Fish & G. Code § 2081.7(a).) Under Fish and Game Code section 2081.7, the following conditions must be met for the Department to authorize the take of fully protected species:

"...

(b) The Quantification Settlement Agreement is executed by the appropriate parties on or before October 12, 2003;

(c) The department has determined that the appropriate agreements have been executed to address environmental impacts at the Salton Sea that include enforceable commitments requiring all of the following:

- (1) Imperial Irrigation District to transfer 800,000 acre-feet of conserved water, by conservation methods selected by the Imperial Irrigation District, to the Department of Water Resources on a mutually agreed upon schedule in exchange for payment of one hundred seventy-five dollars (\$175) per acre-foot. The price shall be adjusted for inflation on an annual basis.
- (2) Imperial Irrigation District to transfer up to 800,000 additional acre-feet of conserved water, by conservation methods selected by the Imperial Irrigation District, to the Department of Water Resources during the first 15 years of the Quantification Settlement Agreement on the schedule established for the mitigation water that was previously to be transferred to the San Diego Water Authority, or on a mutually agreed upon schedule, at no cost for the water in addition to the payment for the water from the mitigation fund described in paragraph (1) of subdivision (b) of Section 3 of Senate Bill 654 of the 2003–04 Regular Session.
- (3) As a condition to acquisition of the water described in paragraph (1), the Department of Water Resources shall be responsible for any environmental impacts, including Salton Sea salinity, related to use or transfer of that water. As a condition to acquisition of the water described in paragraph (2), the Department of Water Resources shall be responsible for environmental impacts related to Salton Sea salinity that are related to the use or transfer of that water.
- (4) The Metropolitan Water District of Southern California (MWD) to purchase up to 1.6 million acre-feet of the water provided in accordance with paragraphs (1) and (2) from the Department of Water Resources at a price of not less than two hundred fifty dollars (\$250) per acre-foot on a mutually agreed upon schedule. The price shall be adjusted for inflation on an annual basis. The Department of Water Resources shall deposit all proceeds from the sale of

water pursuant to this paragraph, after deducting costs and reasonable administrative expenses, into the Salton Sea Restoration Fund.

- (5) The Metropolitan Water District of Southern California to pay not less than twenty dollars (\$20) per acre-foot for all special surplus water received by MWD as a result of reinstatement of access to that water under the Interim Surplus Guidelines by the United States Department of Interior subtracting any water delivered to Arizona as a result of a shortage. The money shall be paid into the Salton Sea Restoration Fund. The price shall be adjusted for inflation on an annual basis. Metropolitan Water District of Southern California shall receive a credit against future mitigation obligations under the Lower Colorado River Multi-Species Conservation Plan for any funds provided under this paragraph to the extent that those funds are spent on projects that contribute to the conservation or mitigation for species identified in the Lower Colorado River Multi-Species Conservation Plan and that are consistent with the preferred alternative for Salton Sea restoration.
  - (6) Coachella Valley Water District, Imperial Irrigation District, and San Diego County Water Authority to pay a total of thirty million dollars (\$30,000,000) to the Salton Sea Restoration Fund as provided in paragraph (2) of subdivision (b) of Section 3 of Senate Bill 654 of the 2003-04 Regular Session.
- (d) All of the following conditions are met:
- (1) The requirements of subdivision (b) and (c) of Section 2081 are satisfied as to the species for which take is authorized.
  - (2) The take authorization provides for the development and implementation, in cooperation with federal and state agencies, of an adaptive management process for monitoring the effectiveness of, and adjusting as necessary, the measures to minimize and fully mitigate the impacts of the authorized take. The adjusted measures are subject to Section 2052.1.
  - (3) The take authorization provides for the development and implementation in cooperation with state and federal agencies of an adaptive management process that substantially contributes to the long-term conservation of the species for which take is authorized."

(Fish & G. Code § 2081.7)

Pursuant to the above-referenced criteria governing the issuance of an incidental take permit which authorizes the take of a fully protected species, the Department hereby makes the findings set forth below for the LCR MSCP Project:

1. The QSA was executed by October 12, 2003.
2. The following appropriate agreements have been entered into that satisfy the

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requirements of 2081.7(c):

- Agreement between the Imperial Irrigation District and the Department of Water Resources for the Transfer of Colorado River Water (dated October 10, 2003)
  - Agreement between the Metropolitan Water District of Southern California and the Department of Water Resources for the Transfer of Colorado River Water (dated October 10, 2003)
  - Agreement between the Metropolitan Water District of Southern California and the California Department of Fish and Game for the Payment by Metropolitan of Twenty Dollars per Acre-Foot of Special Surplus Colorado River Water Received by Metropolitan (dated October 10, 2003)
  - Agreement among the California Department of Fish and Game, the Coachella Valley Water District, the Imperial Irrigation District, and the San Diego County Water Authority for Creation and Funding of a Quantification Settlement Agreement Joint Powers Authority Agreement (dated October 10, 2003)
3. The requirements of subdivision (b) and (c) of section 2081 have been met.
  4. The take authorization provides for the development and implementation, in cooperation with federal and state agencies, of an adaptive management process for monitoring the effectiveness of, and adjusting as necessary, the measures to minimize and fully mitigate the impacts of the authorized take. (See Conditions of Approval 3(c)(iii) and 3(d)(iii) and 3(e)(iii)).
  5. The take authorization provides for the development and implementation in cooperation with the state and federal agencies of an adaptive management process that substantially contributes to the long-term conservation of the species for which take is authorized. (See Condition of Approval 4).

**Conditions of Approval:**

The Department's issuance of this permit and Permittees' authorization to take the Covered Species are subject to Permittees' compliance with and implementation of the following conditions of approval.

- 1) Permittees shall comply with all applicable state, federal, and local laws in existence on the effective date of this permit or adopted thereafter.
- 2) Permittees shall fully implement and adhere to conditions of this permit within the time frames set forth in Attachment 1, the Mitigation Monitoring and Reporting Program (MMRP).

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3) Permittees shall fully implement and adhere to the following conditions:

a) **General Provisions:**

- i) Permittees shall provide Department representatives with reasonable access to the Project site and mitigation lands under its control, and shall otherwise fully cooperate with Department efforts to verify compliance with or effectiveness of mitigation measures.
- ii) Notwithstanding any expiration date on this permit's take authorization, Permittees' obligations under this permit do not end until the Department accepts the Final Mitigation Report as complete.
- iii) Permittees shall cause the LCR MSCP Program Manager to consult with the Department on the implementation of the mitigation measures provided as Conditions of Approval in this Permit. For mitigation measures in the LCR MSCP that are identical to the Conditions of Approval in this permit, the Permittees shall cause Reclamation to implement those measures to ensure compliance with this permit. To the extent that mitigation measures in this permit differ from those contained in the LCR MSCP documents, Permittees remain responsible for implementation of those Conditions of Approval.
- iv) For terms and conditions of this permit that are implemented outside of California, Permittees shall cause Reclamation to coordinate the development of the Replacement Habitat Restoration and Management Plans and the Monitoring, Research, and Adaptive Management Plans. Input from the Department will be sought in conjunction with the Service and the other state resource agencies on the implementation and management activities associated with the conservation and restoration sites.
- v) The Permittees shall consult with the Department, and receive the Department's concurrence on the implementation of LCR MSCP activities conducted in California and provided as Conditions of Approval in this Permit. The Permittees shall also receive the Department's concurrence regarding implementation of any Conditions of Approval in this permit that are not included in the LCR MSCP. For habitat creation activities within California, Permittees shall cause Reclamation to prepare the Replacement Habitat Restoration and Management Plans (Conditions of Approval 3(c)(ii), 3(d)(ii), and 3(e)(ii)) and the Monitoring, Research, and Adaptive Management Plans (Conditions of Approval 3(c)(iii), 3(d)(iii), and 3(e)(iii)), consistent with the terms of the LCR MSCP and this permit, and

those plans shall be submitted to the Department for review and approval. Although Reclamation is not a signatory to this permit, it is the desire of the Permittees and the Department that the implementation of all LCR MSCP activities within California by Reclamation shall be accomplished in a manner that will satisfy Conditions of Approval of this permit. To that end, the Permittees and the Department shall employ their best efforts to consult and coordinate with Reclamation and the Service at all stages of development and implementation of LCR MSCP activities conducted in California to ensure to the extent possible that measures in furtherance of the LCR MSCP are also in compliance with similar Conditions of Approval of this permit. Such consultation and coordination includes participation by the Permittees and the Department on the LCR MSCP Steering Committee established by agreement among the LCR MSCP participants. Permittees shall also cause to be submitted information to the Department regarding proposed habitat acquisitions within California. The Department shall review and respond to the submitted plans, or to a proposed acquisition of mitigation habitat, within 60 days of receipt. If the Department does not approve of a proposed activity or plan, the Regional Manager shall consult with Permittees and/or Reclamation about the reasons for that disapproval. The Department's approval shall not be unreasonably withheld, and the basis for any disapproval will be limited to situations where the Department has a reasonable basis to conclude that the proposed activity or plan will not meet the standards required under Fish and Game Code section 2081(b) and (c). If the Department fails to respond to the submittal of a proposed plan or a proposed activity within 60 days, that plan or activity shall be deemed approved.

- vi) Habitat established within California as mitigation required under this permit shall be protected in perpetuity.

**b) Notification and Reporting:**

- i) Within 90 days of issuance of the permit, Permittees shall designate a representative responsible for communications with the Department and for overseeing compliance with this permit. The Department shall be notified in writing of the representative's name, business address, and telephone number, and shall be notified in writing if a substitute representative is designated.
- ii) Permittees shall immediately notify the Department in writing if it determines

that it is not in compliance with any condition of approval of this permit, including but not limited to any actual or anticipated failure to implement mitigation measures within the time periods indicated in this permit and/or Attachment 1, the MMRP.

- iii) Beginning with issuance of the permit and continuing for the life of the Project, Permittees shall provide the Department an annual Status Report. The due date shall be agreed upon by Permittees and the Department. The Annual Status Report shall include, at a minimum: 1) a general description of the status of the Project, and effects on Covered Species; 2) a copy of the table in the MMRP with notes showing the current implementation status of each mitigation measure; 3) a description of the habitat creation, restoration and monitoring actions conducted over the last year; 4) a summary of the monitoring and research activities undertaken during the previous year; 5) results and analyses of the monitoring and research data; 6) an assessment of the effectiveness of each completed or partially completed mitigation measure in minimizing and compensating for Project impacts; 7) a summary of the marsh acres impacted by non-flow related activities; and 8) other applicable information.
- iv) No later than 180 days after completion of the Project, including completion of all mitigation measures, Permittees shall provide the Department with a Final Mitigation Report. The Final Mitigation Report shall be prepared by a knowledgeable, experienced biologist and shall include, at a minimum: 1) a copy of the table in the MMRP with notes showing when each of the mitigation measures was implemented; 2) all available information about Project-related incidental take of species covered in the Permit; 3) information about other Project impacts on the species covered in the Permit; 4) an assessment of the effectiveness of the Permit's conditions of approval in minimizing and compensating for Project impacts; 5) recommendations on how mitigation measures might be changed to more effectively minimize and mitigate the impacts of future projects on the species; and 6) any other pertinent information, including the level of take associated with the Project.
- v) Permittees shall notify the Department within three working days if a Covered Species is found dead or injured and the death or injury is reasonably attributable to a Covered Activity. A written notification will be made within five calendar days and will include the date, time, and location of the discovered animal/carcass, the expected cause of injury or death and any other pertinent information. Injured animals will be transported to a veterinarian or certified wildlife care facility and the Department informed of

the final disposition of any surviving animal(s). All dead specimen(s)/carcass(es) shall be submitted to an appropriate federal or state wildlife agency or to educational/research institutions possessing the appropriate state and federal permits. If deposition to a wildlife agency or an institution is not practicable, the carcass will be marked, photographed, and left in the field.

**c) Riparian Covered Species (southwestern willow flycatcher, western red bat, western yellow bat, yellow-billed cuckoo, elf owl, gilded flicker, Gila woodpecker, vermilion flycatcher, Arizona Bell's vireo, Sonoran yellow warbler, and summer tanager)**

- i) Pursuant to the terms and conditions of the LCR MSCP, Permittees shall cause to be created/restored, managed, and maintained 7,260 acres of new replacement Riparian Covered Species breeding habitat (the "Riparian Replacement Habitat") consisting of 5,940 acres of cottonwood/willow land cover in LCR MSCP reaches 1-7 and 1,320 acres of honey mesquite land cover in LCR MSCP reaches 1-7. The Riparian Replacement Habitat shall be designed and managed to support cottonwood/willow I-IV and honey mesquite III that provides breeding habitat for the Riparian Covered Species. The Riparian Replacement Habitat shall meet the minimum requirements for achieving habitat creation objectives for each Riparian Covered Species, as specified in Table 5-3 of the LCR MSCP HCP.
- ii) Permittees shall cause to be developed and implemented, in coordination with the Department, a comprehensive restoration, maintenance, monitoring, and reporting plan ("Riparian Replacement Habitat Management Plan") for each site used to create/restore the 7,260 acres of Riparian Replacement Habitat. The Permittees shall cause the Riparian Replacement Habitat Management Plan to be submitted to the Department within one year of site selection for each site for review and approval consistent with section 3(a)(v) of the permit if the land is within California, and for review and comment consistent with section 3(a)(iv) of this permit if the land is outside of California. To ensure that high quality and fully functioning Riparian Replacement Habitat is created/restored, the following information, design, and management criteria, subject to adjustment through the monitoring, research, and adaptive management plan, shall be required as part of the Management Plan:

- o Location of Riparian Replacement Habitat;

- Planting plan (including species composition and layout) of the Riparian Replacement Habitat;
- Grading and other construction activities required to create and implement the Riparian Replacement Habitat;
- Long-term management practices needed to manage the Riparian Replacement Habitat;
- Vegetation and species use monitoring of Riparian Replacement Habitat;
- Success criteria and the actions Permittees will take if the success criteria are not met;
- Riparian Replacement Habitat minimum and maximum patch size criteria;
- Riparian Replacement Habitat patches will be located close to each other or to existing tracts of riparian forest and situated in a manner that will maximize continuity with other riparian land cover types;
- Designs of the Riparian Replacement Habitats will emphasize creation of nesting habitat within 200 feet of standing or slow-moving water or moist surface soils (suitable insect-productive foraging habitats) and will include creation of suitable habitat edges that are preferred by the Covered Riparian species;
- Riparian Replacement Habitat will include provisions for supporting moist surface soils and standing or slow-moving water required by the species within their territories during the breeding season (may extend from March through September along the LCR). Maintaining these conditions will involve creation of canals and shallow swales that permanently or seasonally maintain surface water or moist surface soil conditions. Because the actual period that moist soils or ponded or slow-moving water conditions must be present to support successful reproduction is not well understood, watering of restored habitat will be managed adaptively to determine periods when water must be present to support reproduction;
- Canals and shallow swales will be created to the extent necessary to dissect blocks of restored cottonwood-willow that will be wide enough (estimated to be at least 25 feet) to create interior forest-edge conditions necessary to support Riparian Replacement Habitat, create the microrelief

and soil moisture conditions necessary to support a diversity of understory plant species, and supply irrigation water;

- Riparian Replacement Habitat will be designed and actively managed to support a vigorous plant community that will support multiple layers, seral stages, and age cohorts of trees;
  - Mounds and depressions will be created to the extent necessary in Riparian Replacement Habitat to establish some topographic diversity that will also provide habitat diversity by increasing plant and insect prey species diversity; and
  - Any additional habitat creation concepts described in Section 5.4.3, 5.4.3.1, and 5.4.3.2 of the LCR MSCP HCP that the Department deems necessary.
- iii) Permittees shall cause to be developed and implemented, in cooperation with federal and state agencies, a comprehensive monitoring, research, and adaptive management plan (MRA Plan) for monitoring the effectiveness of, and adjusting as necessary, the measures to minimize and fully mitigate the impacts of the authorized take of the Riparian Covered Species for which take is authorized. The Permittees shall cause the MRA Plan to be submitted to the Department within two years of permit issuance, for review and approval consistent with section 3(a)(v) of the permit. Information collected as part of the MRA Plan will be used to determine the types and frequency of management actions that may be required to maintain habitat conditions (e.g., maintenance of desired stand structure over time).
- iv) Creation/restoration of the Riparian Replacement Habitat within California shall be located on land approved by the Department consistent with section 3(a)(v) of this permit with a minimum of 2,614 acres of the 7,260 replacement acres located within California in LCR MSCP reaches 3, 4, 5, and/or 6. The 2,614 replacement acres in California shall consist of 1,566 acres cottonwood/willow I-IV and 1,048 acres of honey mesquite III. The Riparian Replacement Habitat within California will be created to meet the schedule for establishment in Section 5.10 of the LCR MSCP HCP.
- v) Riparian Replacement Habitat land purchased in fee title by the LCR MSCP within California shall be transferred to the Department, in a form approved by the Department's Office of General Counsel, by the end of the term of this

permit. The Department shall manage any LCR MSCP transferred lands in compliance with and for the benefit of the LCR MSCP in perpetuity.

**d) Marsh Covered Species (Yuma clapper rail, California black rail, western least bittern, and Colorado River cotton rat)**

- i) Permittees shall cause to be created/restored, managed, and maintained 512 acres of new replacement Marsh Covered Species breeding habitat ("Marsh Replacement Habitat") along the lower Colorado River in reaches 3-7. The Marsh Replacement Habitat shall be designed and managed to support breeding habitat for the Marsh Covered Species. The Marsh Replacement Habitat shall meet the minimum requirements for achieving habitat creation objectives for each Marsh Covered Species, as specified in Table 5-3 of the LCR MSCP HCP.
- ii) Permittees shall cause to be developed and implemented, in coordination with the Department, a comprehensive restoration, maintenance, monitoring, and reporting plan ("Marsh Replacement Habitat Management Plan") for each site used to create/restore the 512 acres of Marsh Replacement Habitat. The Permittees shall cause the Marsh Replacement Habitat Management Plan to be submitted to the Department within two years of site selection for each site for review and approval consistent with section 3(a)(v) of the permit for land within California, and for review and comment consistent with section 3(a)(iv) of the permit for land outside of California. To ensure that high quality and fully functioning Marsh Replacement Habitat is created/restored, the following information, design, and management criteria, subject to adjustment through the monitoring, research, and adaptive management plan, shall be required as part of the Management Plan:
  - o Location of Marsh Replacement Habitat;
  - o Planting plan (including species composition and layout) of Marsh Replacement Habitat;
  - o Grading and other construction activities required to create and implement the Marsh Replacement Habitat;
  - o Long-term management practices needed to manage the Marsh Replacement Habitat;

- Vegetation and species use monitoring of Marsh Replacement Habitat;
  - Success criteria and the actions Permittees will take if the success criteria are not met;
  - Marsh Replacement Habitat minimum and maximum patch size criteria;
  - Created/restored Marsh Replacement Habitat patches will be located near occupied Marsh Covered Species, or situated in a manner that will maximize continuity with other marsh land cover types.
  - Marshes created/restored to provide habitat for Marsh Covered Species will be designed and managed to provide an integrated mosaic of emergent aquatic vegetation types, water depths, and open water areas. Vegetation cover will be dominated by *Typha spp.* and *Scirpus spp.*, interspersed with open water and mudflats and managed to maintain its function as species habitat.
  - Yuma clapper rail habitat will be provided by patches of bulrush and cattails interspersed with small patches of open water that maintain water depths appropriate for this species (no more than 12 inches).
  - California black rail habitat will be directed toward restoring moist-soil marshes that support a predominance of three-square bulrush with suitable water depths (i.e. equal to or less than 1 inch deep) to replicate conditions present at Mittry Lake and Bill Williams Delta that support the species; and
  - Any additional habitat creation concepts described in Section 5.4.3, and 5.4.3.3 of the LCR MSCP HCP that the Department deems necessary.
- iii) Permittees shall cause to be developed and implemented, in cooperation with federal and state agencies, a comprehensive monitoring, research, and adaptive management plan (MRA Plan) for monitoring the effectiveness of, and adjusting as necessary, the measures to minimize and fully mitigate the impacts of the authorized take of the Marsh Covered Species for which take is authorized. The Permittees shall cause the MRA Plan to be submitted to the Department within two years of permit issuance for review and approval consistent with section 3(a)(v) of the permit. Information collected as part of the MRA Plan will be used to determine the types and frequency of management actions that may be required to maintain habitat conditions

(e.g., maintenance of desired marsh structure over time).

- iv) Creation/restoration of the Marsh Replacement Habitat within California shall be located in areas approved by the Department consistent with section 3(a)(v) of this permit with a minimum of 240 acres of the 512 replacement acres located within California in reaches 3, 4, 5, and/or 6. Of the 240 acres in California, 170 acres shall be designed and managed to provide habitat for the Yuma clapper rail and western least bittern, and 70 acres shall be designed and managed to provide habitat for the California black rail. The 240 acres shall also support at least 58 acres of Colorado River cotton rat habitat. The Marsh Replacement Habitat within California will be created to meet the schedule for establishment in Section 5.10 of the LCR MSCP HCP.
- v) Marsh Replacement Habitat purchased in fee title by the LCR MSCP within California shall be transferred to the Department in a form approved by the Department's Office of General Counsel, by the end of the term of this permit. The Department shall manage any LCR MSCP transferred lands in compliance with and for the benefit of the LCR MSCP.
- vi) PVID and BWD shall submit to the Department a map of the drains and canals that are routinely maintained as described in the section of this permit entitled "Non-Flow-Related Covered Activities." During the breeding season for Marsh Covered Species, PVID and BWD shall not perform maintenance of drains and canals in which submerged aquatic or emergent aquatic vegetation is present. However, PVID and BWD may, under emergency conditions, undertake the work reasonably necessary to prevent personal injury or property damage such as field flooding due to breaks in drains, bank sloughing, and clogged siphons.
- vii) PVID and BWD will keep an annual running total of Marsh Covered Species habitat removed that will count towards the allowable removal acreage, and this information will be available upon Department request. PVID and BWD shall submit an annual status report to the Department by December 31st of each year. The annual status report must include the locations of drains and canals that have been maintained during the year, and acreage of habitat removed during the current year.

**e) Aquatic Covered Species (razorback sucker, bonytail chub, and flannelmouth sucker):**

- i) Permittees shall cause to be created/restored, managed, and maintained 360 acres of new replacement Aquatic Covered Species breeding habitat ("Backwater Replacement Habitat") along the lower Colorado River in reaches 1-6. The Backwater Replacement Habitat shall be designed and managed to support breeding habitat for the Aquatic Covered Species. The Backwater Replacement Habitat shall meet the minimum requirements for achieving habitat creation objectives for each Aquatic Covered Species, as specified in Table 5-3 of the LCR MSCP HCP.
  
- ii) Permittees shall cause to be developed and implemented, in coordination with the Department, a comprehensive restoration, maintenance, monitoring, and reporting plan ("Backwater Replacement Habitat Management Plan") for each site used to create/restore the 360 acres of Backwater Replacement Habitat. The Permittees shall cause the Backwater Replacement Habitat Management Plan to be submitted to the Department within one year of site selection for each site for review and approval consistent with section 3(a)(v) of the permit for land within California, and for review and comment consistent with section 3(a)(iv) of the permit for land outside of California. To ensure that high quality and fully functioning Backwater Replacement Habitat is created/restored, the following information, design, and management criteria, subject to adjustment through the monitoring, research, and adaptive management plan, shall be required as part of the Management Plan:
  - Location of Backwater Replacement Habitat;
  - Design and planting plan (including species composition and layout) of the Backwater Replacement Habitat;
  - Dredging, grading, and other construction activities required to create and implement the Backwater Replacement Habitat;
  - Long-term management practices needed to manage and maintain the Backwater Replacement Habitat;
  - Vegetation and species use monitoring of Backwater Replacement Habitat;

- Success criteria and the actions Permittees will take if the success criteria are not met;
  - Created/restored backwaters will meet a rating of *good* for fish, using the rating system developed by Holden et al. in 1986. This rating system provides a way to rank the quality of backwater habitat for fish and wildlife, based on several parameters, including water quality;
  - Backwater Replacement Habitat will be designed with water depth, vegetation, and substrate characteristics that provide the constituent elements of Aquatic Covered Species habitat and, to the extent possible, provide surface and groundwater hydrology in support of existing or created/restored habitat for the riparian and marsh covered species;
  - Connected backwaters will be designed to provide the environmental conditions necessary to support adult or subadult razorback sucker, and bonytail;
  - Created/restored Backwater Replacement Habitat will be combined with creation/restoration of Riparian and Marsh Replacement Habitats to provide a mosaic of land cover types;
  - Backwater Replacement Habitat will be designed to provide for the establishment of bulrush and cattails along the edges;
  - Backwaters, integral to flycatcher breeding habitat, will be designed and managed to maintain standing water and moist soils during the southwestern willow flycatcher breeding season; and
  - Any additional habitat creation concepts described in Section 5.4.3, and 5.4.3.4 of the LCR MSCP HCP that the Department deems necessary.
- iii) Permittees shall cause to be developed and implemented, in cooperation with federal and state agencies, a comprehensive monitoring, research, and adaptive management plan (MRA Plan) for monitoring the effectiveness of, and adjusting as necessary, the measures to minimize and fully mitigate the impacts of the authorized take of the Aquatic Covered Species for which take is authorized. The Permittees shall cause the MRA Plan to be submitted to the Department within one year of permit issuance for review and approval consistent with section 3(a)(v) of the permit. Information collected as part of the MRA Plan will be used to determine the types and frequency of

management actions that may be required to maintain habitat conditions (e.g., maintenance of desired backwater conditions over time).

- iv) Creation/restoration of the Backwater Replacement Habitat within California shall be located in areas approved by the Department consistent with section 3(a)(v) of the permit with a minimum of 194 acres of the 360 replacement acres located within California in reaches 3, 4, 5, and/or 6. Backwater Replacement Habitat within California will be created to meet the schedule for establishment in Section 5.10 of the LCR MSCP HCP.
- v) Backwater Replacement Habitat purchased in fee title by the LCR MSCP within California shall be transferred to the Department in a form approved by the Department's Office of General Counsel, by the end of the term of this permit. The Department shall manage any LCR MSCP transferred lands in compliance with and for the benefit of the LCR MSCP.
- vi) Permittees shall cause the stocking of 660,000 razorback suckers (at least 12 inches in length) and 620,000 bonytail (at least 12 inches in length) in the LCR. At least 270,000 razorback suckers and 200,000 bonytail shall be stocked in reaches 4 and 5. Permittees shall cause to be developed and implemented, in cooperation with the Department, a "Fish Augmentation Plan" that sets forth stocking rates and locations, research and monitoring activities, conditions and criteria under which fish augmentation may cease, and alternative measures to minimize and fully mitigate for the authorized incidental take in the event that fish augmentation measures cease. The Permittees shall cause the Fish Augmentation Plan to be submitted to the Department for review and approval consistent with section 3(a)(v) of the permit. Stocking of razorback suckers and bonytail may cease and other mitigation measures implemented if, through monitoring and research results, the Department determines consistent with section 3(a)(v) that: 1) stocking efforts have resulted in adequate numbers of adults to provide genetic refuge or to create a self-sustaining population; 2) conservation actions other than stocking would be more effective in contributing to the recovery of the species; 3) conditions are not conducive to the survival of stocked fish; 4) biological or other factors warrant cessation of stocking; or 5) other conditions and criteria as set forth in the Fish Augmentation Plan are met. In accordance with the Fish Augmentation Plan, funds not expended for the fish augmentation program would be directed toward other mitigation measures that would fully mitigate for authorized incidental take. Alternative mitigation measures, to be implemented within one year of cessation of stocking, will include, at a minimum, the following:

- Stock fewer, but larger fish. This approach would be appropriate, for example, if monitoring indicates that stocking larger fish would substantially increase survivorship.
  - Establish fish in additional created isolated backwaters that could be maintained free of non-native predators/competitors. This approach may be appropriate if survivorship of stocked fish is substantially impaired by non-native predator/competitors or the quality of mainstem river habitat conditions.
  - If augmentations are not succeeding, fund additional directed research to identify causative factors and develop and implement appropriate measures that could be implemented to improve the success of species conservation efforts. This approach would be appropriate if the causative factors are not identified through the augmentation-related monitoring program.
- 4) Subject to the availability of funds as described in Section 2081.7(d)(3) of the Fish and Game Code, the Department, in cooperation with state and federal agencies, shall develop and implement an adaptive management process that substantially contributes to the long-term conservation of the species for which take is authorized. Additional procedures and measures may be necessary to meet this standard. Subject to the appropriation of funds, preparation of this additional adaptive management program and implementation of the program is the responsibility of the Department, but does not modify Permittees' responsibilities under sections 3(c)(iii), 3(d)(iii), and 3(e)(iii) above to develop and implement an adaptive management process.
- 5) Permittees shall provide an endowment and enhancement fee of \$295.00 per acre (in 2005 dollars) to the Department for each acre of habitat that is transferred to the Department in fee title at the time of such title transfer, and for Department lands dedicated to the LCR MSCP. Interest from this amount shall be available for the operation, management and protection of the lands transferred to or owned by the Department, and may be spent on reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action designed to protect or improve the habitat values of the lands. The endowment principal shall not be drawn upon unless such withdrawal is deemed necessary by the Department to ensure the continued viability of the species on the lands. Monies received by the Department pursuant to this provision shall be deposited in a special deposit account established pursuant to Government Code §16370. The Department may pool the endowment with other endowments for the operation, management and protection of lands for local populations of the Covered

Species. The Department shall manage any LCR MSCP land transferred to the Department in fee, and for Department lands dedicated to the LCR MSCP, in compliance with and for the benefit of the LCR MSCP and consistent with the Department's mission statement.

- 6) The Department recently purchased approximately 1,300 acres known as the Travis Ranch within the plan area, which will be available for purposes of habitat creation and protection in conjunction with the LCR MSCP and the Department's mission. The Permittees shall commit to directing a portion of the LCR MSCP funding for restoring, creating, and managing Covered Species habitat on Department lands dedicated to the MSCP. Restoration efforts on Department lands shall require Department approval and shall be initiated within 5 years of issuance of this Permit. Creation of up to 1300 acres of Covered Species habitat on Department lands shall be accomplished in accordance with this permit and will count toward the requirements for creation of Replacement Habitat(s) as specified in this Permit.
- 7) For any land that is transferred to the Department under the terms of this permit, Permittees shall:
  - a) Transfer fee title to the lands to the Department under terms approved by the Department's Office of the General Counsel.
  - b) Provide a recent preliminary title report, initial hazardous materials survey report, and other necessary documents (see Attachment 2). All documents conveying the lands and all conditions of title are subject to the approval of the Department, the Department of General Services and, if applicable, the Fish and Game Commission.
  - c) Reimburse the Department for reasonable expenses incurred during title and documentation review, expenses incurred from other state agency reviews and overhead related to transfer of lands to the Department. The Department estimates that this Project will create an additional cost to the Department of no more than \$3,000 for every fee title deed or easement processed.
- 8) This permit may be amended as required by law if the Department determines that continued implementation of the Project under existing permit conditions would jeopardize the continued existence of a Covered Species or if the Department determines, after consultation with Permittees, that changed biological conditions necessitate a permit amendment to ensure that impacts to the Covered Species are minimized and fully mitigated.

- 9) The Department may suspend this permit as to any Permittee if such Permittee is not in compliance with the conditions of this permit and/or any funding agreement entered into to provide funds to implement the Conditions of Approval in this permit or to prevent the illegal take of an endangered, threatened, or candidate species through a Covered Activity. Notwithstanding the foregoing, the Department shall not suspend this permit without first: (1) notifying the affected Permittee in writing that this permit may be subject to suspension including a statement of the deficiencies that must be corrected by the Permittee, and (2) providing the affected Permittee an opportunity to correct the deficiencies. Notwithstanding the above, if the Department determines that the continued implementation of the Project under existing permit conditions would jeopardize the continued existence of Covered Species, or if required by statutory enactments subsequent to the issuance of the permit, the Department may suspend the permit as to that action immediately.

A suspension of the permit shall be limited to a specific action, covered species, or portion of the plan area. In the event of a partial suspension, the portion of this permit not subject to the suspension shall remain in full force and effect. Procedures applicable to any suspension shall be in accordance with the suspension process pursuant to California Code of Regulations, title 14, section 783.7.

Any action to revoke any privileges under this permit shall be limited so as to address the discrete action or inaction, or statutory enactment that has resulted in the revocation, to the extent consistent with the species protection purposes of the permit. A revocation may be applicable to only one of the Permittees. In the event of a partial revocation, the portion of this permit not subject to the revocation shall remain in full force and effect. When the Department believes there are valid grounds for suspending or revoking a permit, the Permittee shall be notified in writing of the proposed suspension or revocation. In no case shall a proposed revocation notice be issued prior to 60 days from the notice to prevent or remedy a violation.

- 10) In the event that any Permittee shall permanently discontinue a Covered Activity, the Permittee shall return this permit to the Department with a written statement surrendering this permit for cancellation. This permit shall be deemed cancelled only upon a determination by the Department that sufficient compliance to the conditions of the permit have been made to mitigate for take of Covered Species that occurred pursuant to the terms of this permit before its surrender. Upon surrender of this permit, no further take of the Covered Species associated with Covered Activities by the Permittee shall be authorized.

- 11) The total cost of the LCR MSCP over its 50-year term is six hundred twenty-six million dollars (\$626,000,000). Permittees have entered into a Funding and Management Agreement dated April 2005 with other participating state and federal LCR MSCP agencies. Under that agreement, the federal government has agreed to pay 50% of the total program cost. The Permittees have agreed to pay 50% of the non-federal program cost. Each year during the term of the LCR MSCP, the Permittees shall provide funding for their share of the total cost of the LCR MSCP as specified in the California Cost Share Agreement dated April 2005. Such annual funding will be provided no later than the beginning of the fiscal year, or such later date as provided by the LCR MSCP budget or work plan.

### **Compliance with Other Laws**

This permit contains the Department's requirements for the project pursuant to CESA. This permit does not necessarily create an entitlement to proceed with the project. The Permittees are responsible for complying with all other applicable state, federal, and local laws.

### **Notices**

Written notices, reports and other communications relating to this permit shall be delivered to the Department by first class mail at the following addresses, or at addresses the Department may subsequently provide the Permittees:

Original to: Regional Manager  
Department of Fish and Game  
4665 Lampson Ave., Suite J  
Los Alamitos, CA 90720

Copy to: Department of Fish and Game  
Eastern Sierra and Inland Deserts Region  
P.O. Box 2160  
Blythe, CA 92226

General Counsel  
Department of Fish and Game  
1416 Ninth Street, 12th Floor  
Sacramento, CA 95814

Incidental Take Permit  
No. 2081-2005-008-06  
CA WATER AND POWER AGENCIES  
LCR MSCP

And: Habitat Conservation Planning Branch  
Department of Fish and Game  
1416 Ninth Street, Suite 1260  
Sacramento, CA 95814

**Attachments:**

ATTACHMENT 1 Mitigation Monitoring and Reporting Program

ATTACHMENT 2 Habitat Management Lands Acquisition Checklist;  
PLFAF form

ISSUED BY THE CALIFORNIA DEPARTMENT OF FISH AND GAME  
on April 4, 2005.

  
L. RYAN BRODDRICK, Director

Approval as to form:  
  
Michael R. Valentine  
General Counsel

Incidental Take Permit  
No. 2081-2005-008-06  
CA WATER AND POWER AGENCIES  
LCR MSCP

**ACKNOWLEDGMENT**

The undersigned applicant acknowledges receipt of this permit and, by signing, accepts and agrees to comply with all terms and conditions of the permit.

By: \_\_\_\_\_

Date:

Name:

Title:

Incidental Take Permit  
No. 2081-2005-008-06  
CA WATER AND POWER AGENCIES  
LCR MSCP

By: \_\_\_\_\_

Date:

Name:

Title:

**ACKNOWLEDGMENT**

The undersigned applicant acknowledges receipt of this permit and, by signing, accepts and agrees to comply with all terms and conditions of the permit.

**BARD WATER DISTRICT**

By: Ron Derma  
Ron Derma  
General Manager

Date: 7/12/05

Address for Notices:

Ron Derma  
Bard Water District  
1473 Ross Road  
Winterhaven, CA 92283-9715  
Fax: (760) 572-0183

[Signatures continued on next page]

**ACKNOWLEDGMENT**

The undersigned applicant acknowledges receipt of this permit and, by signing, accepts and agrees to comply with all terms and conditions of the permit.

**CITY OF NEEDLES**

By:   
Richard D. Rowe  
City Manager

Date: 4/12/05

Address for Notices:

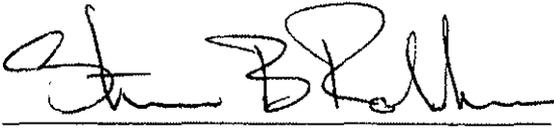
Richard D. Rowe  
City of Needles  
817 Third Street  
Needles, CA 92363-2933  
Fax: (760) 326-6765

[Signatures continued on next page]

**ACKNOWLEDGMENT**

The undersigned applicant acknowledges receipt of this permit and, by signing, accepts and agrees to comply with all terms and conditions of the permit.

**COACHELLA VALLEY WATER DISTRICT**

By:   
Steven B. Robbins  
General Manager—Chief Engineer

Date: 4/16/05

Address for Notices:  
Steven B. Robbins  
Coachella Valley Water District  
Post Office Box 1058  
Coachella, CA 92236  
Fax: (760) 398-3711

[Signatures continued on next page]

**ACKNOWLEDGMENT**

The undersigned applicant acknowledges receipt of this permit and, by signing, accepts and agrees to comply with all terms and conditions of the permit.

**COLORADO RIVER BOARD OF CALIFORNIA**

By:   
Gerald Zimmerman  
Executive Director

Date: 4/13/2005

Address for Notices:

Gerald R. Zimmerman  
Colorado River Board of California  
770 Fairmont Avenue, Suite 100  
Glendale, CA 91203-1035  
Fax: (818) 543-4685

[Signatures continued on next page]

**ACKNOWLEDGMENT**

The undersigned applicant acknowledges receipt of this permit and, by signing, accepts and agrees to comply with all terms and conditions of the permit.

**IMPERIAL IRRIGATION DISTRICT**

By:   
Jesse P. Silva  
General Manager

Date: 4-13-05

Address for Notices:

Jesse P. Silva  
Imperial Irrigation District  
Post Office Box 937  
Imperial, CA 92251  
Fax: (760) 482-9611

[Signatures continued on next page]

**ACKNOWLEDGMENT**

The undersigned applicant acknowledges receipt of this permit and, by signing, accepts and agrees to comply with all terms and conditions of the permit.

**THE METROPOLITAN WATER DISTRICT  
OF SOUTHERN CALIFORNIA**

By: Laura J. Simonek  
Laura Simonek  
Manager, Environmental Planning Team

Date: April 8, 2005

Address for Notices:

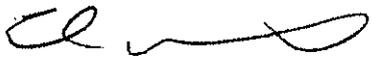
Laura Simonek  
Environmental Planning Team  
The Metropolitan Water District of Southern California  
700 North Alameda Street  
Los Angeles, CA 90012  
Fax: (213) 217-5620

[Signatures continued on next page]

**ACKNOWLEDGMENT**

The undersigned applicant acknowledges receipt of this permit and, by signing, accepts and agrees to comply with all terms and conditions of the permit.

**PALO VERDE IRRIGATION DISTRICT**

By:   
\_\_\_\_\_  
Edward W. Smith  
General Manager

Date: 4/12/05

Address for Notices:

Edward W. Smith  
Palo Verde Irrigation District  
180 West Fourteenth Avenue  
Blythe, CA 92225  
Fax: (760) 922-8294

[Signatures continued on next page]

**ACKNOWLEDGMENT**

The undersigned applicant acknowledges receipt of this permit and, by signing, accepts and agrees to comply with all terms and conditions of the permit.

**SAN DIEGO COUNTY WATER AUTHORITY**

By: *Laurence Purcell*  
Laurence Purcell  
Water Resources Manager

Date: April 11, 2005

Address for Notices:

Laurence Purcell  
San Diego County Water Authority  
4677 Overland Avenue  
San Diego, CA 92123  
Fax: (858) 268-7881

[Signatures continued on next page]

**ACKNOWLEDGMENT**

The undersigned applicant acknowledges receipt of this permit and, by signing, accepts and agrees to comply with all terms and conditions of the permit.

**SOUTHERN CALIFORNIA EDISON COMPANY**

*mm*

By: *John R. Fielder*

John R. Fielder

Senior Vice President, Regulatory Policy & Affairs

Date: 4/19/05

Address for Notices:

Nino J. Mascolo  
Southern California Edison Company  
2244 Walnut Grove Avenue  
Rosemead, CA 91770  
Fax: (626) 302-1926

[Signatures continued on next page]

**ACKNOWLEDGMENT**

The undersigned applicant acknowledges receipt of this permit and, by signing, accepts and agrees to comply with all terms and conditions of the permit.

**SOUTHERN CALIFORNIA PUBLIC POWER AUTHORITY**

By:   
\_\_\_\_\_  
William D. Carnahan  
Executive Director

Date: \_\_\_\_\_

Address for Notices:

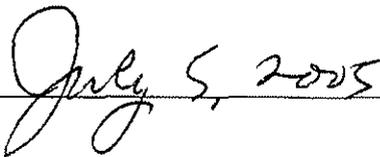
William D. Carnahan  
Southern California Public Power Authority  
225 S. Lake Avenue, Suite 1250  
Pasadena, CA 91101  
Fax: (626) 793-9461

**ACKNOWLEDGMENT**

The undersigned applicant acknowledges receipt of this permit and, by signing, accepts and agrees to comply with all terms and conditions of the permit.

**DEPARTMENT OF WATER AND POWER OF THE CITY OF LOS ANGELES**

By:   
Ronald F. Deaton  
General Manager

Date: 

Address for Notices:

Mohammed Beshir  
City of Los Angeles Department of Water and Power  
111 North Hope Street, Room 1044  
Los Angeles, CA 90012  
Phone: (213) 367-0237

Incidental Take Permit  
No. 2081-2005-008-06  
CA WATER AND POWER AGENCIES  
LCR MSCP

## ATTACHMENT 1

### DEPARTMENT OF FISH AND GAME MITIGATION MONITORING AND REPORTING PROGRAM (MMRP)

CALIFORNIA INCIDENTAL TAKE PERMIT NO. 2081-2005-008-06  
PERMITTEE: CALIFORNIA WATER AND POWER AGENCIES  
PROJECT: LOWER COLORADO RIVER MULTI-SPECIES  
CONSERVATION PROGRAM

#### **PURPOSE OF THE MMRP**

The purpose of the MMRP is to ensure that the impact minimization and mitigation measures required by the Department of Fish and Game (Department) for the above-referenced project are properly implemented, and thereby to ensure compliance with section 2081(b) of the Fish and Game Code and section 21081.6 of the Public Resources Code. A table summarizing the mitigation measures required by the Department is attached. This table is a tool for use in monitoring and reporting on implementation of mitigation measures, but the descriptions in the table do not supersede the mitigation measures set forth in the California Incidental Take Permit (Permit) and in attachments to the Permit, and the omission of a permit requirement from the attached table does not relieve the Permittee of the obligation to ensure the requirement is performed.

#### **OBLIGATIONS OF PERMITTEE**

Mitigation measures must be implemented within the time periods indicated in the table that appears below. Permittee has the primary responsibility for monitoring compliance with all mitigation measures and for reporting to the Department on the progress in implementing those measures. These monitoring and reporting requirements are set forth in the Permit itself and are summarized at the front of the attached table.

#### **VERIFICATION OF COMPLIANCE, EFFECTIVENESS**

The Department may, at its sole discretion, verify compliance with any mitigation measure or independently assess the effectiveness of any mitigation measure.

## TABLE OF MITIGATION MEASURES

The following items are identified for each mitigation measure: Mitigation Measure, Source, Implementation Schedule, Responsible Party, and Status/Date/Initials. The "Mitigation Measure" column summarizes the mitigation requirements of the Permit. The "Source" column identifies the Permit document that sets forth the mitigation measure. The "Implementation Schedule" column shows the date or phase when each mitigation measure will be implemented. The "Responsible Party" column identifies the person or agency that is primarily responsible for implementing the mitigation measure. The "Status/Date/Initials" column shall be completed by the Permittee during preparation of each Status Report and the Final Mitigation Report, and must identify the implementation status of each mitigation measure, the date that status was determined, and the initials of the person determining the status.

	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
1	Permittees shall comply with all applicable state, federal, and local laws in existence on the effective date of this permit or adopted thereafter.	Permit	Entire project	Permittees	
2	The Department may, at its sole discretion, verify compliance with any mitigation measure or independently assess the effectiveness of any mitigation measure.	MMRP	Entire project	Department of Fish and Game	
3	Permittees shall fully cooperate with the Department in its efforts to verify compliance with or effectiveness of mitigation measures.	MMRF	Entire project	Permittees	
4	Permittees shall immediately notify the Department in writing if they determine that they are not in compliance with any condition of approval of the permit, including but not limited to any actual or anticipated failure to implement mitigation measures within the time periods indicated in the permit and/or this MMRP.	Permit	Entire project	Permittees	
5	The Department accepts the Final Mitigation Report as complete.	Permit	Post-project	Department of Fish and Game	
6	Permittees shall cause the LCR MSCP Program Manager to consult with the Department on the implementation of the mitigation measures provided as Conditions of Approval in the Permit. For mitigation measures in the LCR MSCP that are identical to the Conditions of Approval in the permit, the Permittees shall cause Reclamation to implement those measures to ensure compliance with the permit. To the extent that mitigation measures in the permit differ from those contained in the LCR MSCP documents, Permittees remain responsible for implementation of those Conditions of Approval.	Permit	Entire project	Permittees	
7	For terms and conditions of the permit that are implemented outside of California, Permittees shall cause Reclamation to coordinate the development of the Replacement Habitat Restoration and Management Plans and the Monitoring, Research, and Adaptive Management Plans. Input from the Department will be sought in conjunction with the Service and the other state resource agencies on the implementation and management activities associated with the conservation and restoration sites.	Permit	Entire project	Permittees	

	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
8	The Permittees shall consult with the Department, and receive the Department's concurrence on the implementation of LCR MSCP habitat creation activities conducted in California and provided as Conditions of Approval in the Permit. The Permittees shall also receive the Department's concurrence for any Conditions of Approval in the permit that are not included in the LCR MSCP. For habitat creation activities within California, Permittees shall cause Reclamation to prepare the Replacement Habitat Restoration and Management Plans (Conditions of Approval 3(c)(ii), 3(d)(ii), and 3(e)(ii)) and the Monitoring, Research, and Adaptive Management Plans (Conditions of Approval 3(c)(iii), 3(d)(iii), and 3(e)(iii)), consistent with the terms of the LCR MSCP and the permit, and those plans shall be submitted to the Department for review and approval. Although Reclamation is not a signatory to this permit, it is the desire of the Permittees and the Department that the implementation of all LCR MSCP activities within California by Reclamation shall be accomplished in a manner that will satisfy Conditions of Approval of this permit. To that end, the Permittees and the Department shall employ their best efforts to consult and coordinate with Reclamation and the Service at all stages of development and implementation of LCR MSCP activities conducted in California to ensure to the extent possible that measures in furtherance of the LCR MSCP are also in compliance with similar Conditions of Approval of this permit. Such consultation and coordination includes participation by the Permittees and the Department on the LCR MSCP Steering Committee established by agreement among the LCR MSCP participants. Permittees shall also cause to be submitted information to the Department regarding proposed habitat acquisitions within California. The Department shall review and respond to the submitted plans, or to a proposed acquisition of mitigation habitat, within 60 days of receipt. If the Department does not approve of a proposed activity or plan, the Regional Manager shall consult with Permittees and/or Reclamation about the reasons for that disapproval. The Department's approval shall not be unreasonably withheld, and the basis for any disapproval will be limited to situations where the Department has a reasonable basis to conclude that the proposed activity or plan will not meet the standards required under Fish and Game Code section 2081(b) and (c). If the Department fails to respond to the submittal of a proposed plan or a proposed activity within 60 days, that plan or activity shall be deemed approved.	Permit	Entire project	Permittees/ Department of Fish and Game	
9	Habitat established within California as mitigation required under this permit shall be protected in perpetuity.	Permit	Entire project	Permittees	
10	Within 90 days of issuance of the permit, Permittees shall designate a representative responsible for communications with the Department and for overseeing compliance with this permit. The Department shall be notified in writing of the representative's name, business address, and telephone number, and shall be notified in writing if a substitute representative is designated.	Permit	July 5, 2005	Permittees	

	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
11	Beginning with issuance of the permit and continuing for the life of the Project, Permittees shall provide the Department an annual Status Report. The due date shall be agreed upon by Permittees and the Department. The Annual Status Report shall include, at a minimum: 1) a general description of the status of the Project, and effects on Covered Species; 2) a copy of the table in the MMRP with notes showing the current implementation status of each mitigation measure; 3) a description of the habitat creation, restoration and monitoring actions conducted over the last year; 4) a summary of the monitoring and research activities undertaken during the previous year; 5) results and analyses of the monitoring and research data; 6) an assessment of the effectiveness of each completed or partially completed mitigation measure in minimizing and compensating for Project impacts; 7) a summary of the marsh acres impacted by non-flow related activities; and 8) other applicable information.	Permit	Entire project	Permittees	
12	No later than 180 days after completion of the Project, including completion of all mitigation measures, Permittees shall provide the Department with a Final Mitigation Report. The Final Mitigation Report shall be prepared by a knowledgeable, experienced biologist and shall include, at a minimum: 1) a copy of the table in the MMRP with notes showing when each of the mitigation measures was implemented; 2) all available information about Project-related incidental take of species covered in the Permit; 3) information about other Project impacts on the species covered in the Permit; 4) an assessment of the effectiveness of the Permit's conditions of approval in minimizing and compensating for Project impacts; 5) recommendations on how mitigation measures might be changed to more effectively minimize and mitigate the impacts of future projects on the species; and 6) any other pertinent information, including the level of take associated with the Project.	Permit	Post-project	Permittees	
13	Permittees shall notify the Department within three working days if a Covered Species is found dead or injured and the death or injury is reasonably attributable to a Covered Activity. A written notification will be made within five calendar days and will include the date, time, and location of the discovered animal/carcass, the expected cause of injury or death and any other pertinent information. Injured animals will be transported to a veterinarian or certified wildlife care facility and the Department informed of the final disposition of any surviving animal(s). All dead specimen(s)/carcass(es) shall be submitted to an appropriate federal or state wildlife agency or to educational/research institutions possessing the appropriate state and federal permits. If deposition to a wildlife agency or an institution is not practicable, the carcass will be marked, photographed, and left in the field.	Permit	Entire project	Permittees	
14	Pursuant to the terms and conditions of the LCR MSCP, Permittees shall cause to be created/restored, managed, and maintained 7,260 acres of new replacement Riparian Covered Species breeding habitat (the "Riparian Replacement Habitat") consisting of 5,940 acres of cottonwood/willow land cover in LCR MSCP reaches 1-7 and 1,320 acres of honey mesquite land cover in LCR MSCP reaches 1-7. The Riparian Replacement Habitat shall be designed and managed to support cottonwood/willow I-IV and honey mesquite III that provides breeding habitat for the Riparian Covered Species. The Riparian Replacement Habitat shall meet the minimum requirements for achieving habitat creation objectives for each Riparian Covered Species, as specified in Table 5-3 of the LCR MSCP HCP.	Permit	Entire Project	Permittees	

	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
15	Permittees shall cause to be developed and implemented, in coordination with the Department, a comprehensive restoration, maintenance, monitoring, and reporting plan ("Riparian Replacement Habitat Management Plan") for each site used to create/restore the 7,260 acres of Riparian Replacement Habitat. The Permittees shall cause the Riparian Replacement Habitat Management Plan to be submitted to the Department within one year of site selection for each site for review and approval consistent with section 3(a)(v) of the permit if the land is within California, and for review and comment consistent with section 3(a)(iv) of the permit if the land is outside of California.	Permit	Entire project	Permittees	
16	Permittees shall cause to be developed and implemented, in cooperation with federal and state agencies, a comprehensive monitoring, research, and adaptive management plan (MRA Plan) for monitoring the effectiveness of, and adjusting as necessary, the measures to minimize and fully mitigate the impacts of the authorized take of the Riparian Covered Species for which take is authorized. The Permittees shall cause the MRA Plan to be submitted to the Department within two years of permit issuance, for review and approval consistent with section 3(a)(v) of the permit. Information collected as part of the MRA Plan will be used to determine the types and frequency of management actions that may be required to maintain habitat conditions (e.g., maintenance of desired stand structure over time).	Permit	July 5, 2007	Permittees	
17	Riparian Replacement Habitat shall be monitored and adaptively managed over time to determine the types and frequency of management actions that may be required to maintain habitat conditions (e.g., maintenance of desired stand structure over time). The Permittees shall conduct surveys and research, as appropriate, to collect information necessary to better define the covered species' habitat requirements and to design and manage fully functioning Riparian Replacement Habitat.	Permit	Entire project	Permittees	
18	Creation/restoration of the Riparian Replacement Habitat within California shall be located on land approved by the Department consistent with section 3(a)(v) of the permit with a minimum of 2,614 acres of the 7,260 replacement acres located within California in LCR MSCP reaches 3, 4, 5, and/or 6. The 2,614 replacement acres in California shall consist of 1,566 acres cottonwood/willow I-IV and 1,048 acres of honey mesquite III. The Riparian Replacement Habitat within California will be created to meet the schedule for establishment in Section 5.10 of the LCR MSCP HCP.	Permit	Entire project	Permittees	
19	Permittees shall cause to be created/restored, managed, and maintained 512 acres of new replacement Marsh Covered Species breeding habitat ("Marsh Replacement Habitat") along the lower Colorado River in reaches 3-7. The Marsh Replacement Habitat shall be designed and managed to support breeding habitat for the Marsh Covered Species. The Marsh Replacement Habitat shall meet the minimum requirements for achieving habitat creation objectives for each Marsh Covered Species, as specified in Table 5-3 of the LCR MSCP HCP.	Permit	Entire project	Permittees	
20	Permittees shall cause to be developed and implemented, in coordination with the Department, a comprehensive restoration, maintenance, monitoring, and reporting plan ("Marsh Replacement Habitat Management Plan") for each site used to create/restore the 512 acres of Marsh Replacement Habitat. The Permittees shall cause the Marsh Replacement Habitat Management Plan to be submitted to the Department within two years of site selection for each site for review and approval consistent with section 3(a)(v) of the permit for land within California, and for review and comment consistent with section 3(a)(iv) of the permit for land outside of California.	Permit	Within two years of site selection for each site	Permittees	

	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
21	Permittees shall cause to be developed and implemented, in cooperation with federal and state agencies, a comprehensive monitoring, research, and adaptive management plan (MRA Plan) for monitoring the effectiveness of, and adjusting as necessary, the measures to minimize and fully mitigate the impacts of the authorized take of the Marsh Covered Species for which take is authorized. The Permittees shall cause the MRA Plan to be submitted to the Department within two years of permit issuance for review and approval consistent with section 3(a)(v) of the permit. Information collected as part of the MRA Plan will be used to determine the types and frequency of management actions that may be required to maintain habitat conditions (e.g., maintenance of desired marsh structure over time).	Permit	July 5, 2007	Permittees	
22	Marsh Replacement Habitat will be monitored and adaptively managed over time to determine the types and frequency of management actions that may be required to maintain habitat conditions (e.g., maintenance of desired stand structure over time). The Permittees shall conduct surveys and research, as appropriate, to collect information necessary to better define the species' habitat requirements and to design and manage fully functioning Marsh Replacement Habitat.	Permit	Entire project	Permittees	
23	Creation/restoration of the Marsh Replacement Habitat within California shall be located in areas approved by the Department consistent with section 3(a)(v) of the permit with a minimum of 240 acres of the 512 replacement acres located within California in reaches 3, 4, 5, and/or 6. Of the 240 acres in California, 170 acres shall be designed and managed to provide habitat for the Yuma clapper rail and western least bittern, and 70 acres shall be designed and managed to provide habitat for the California black rail. The 240 acres shall also support at least 58 acres of Colorado River cotton rat habitat. The Marsh Replacement Habitat within California will be created to meet the schedule for establishment in Section 5.10 of the LCR MSCP HCP.	Permit	Entire project	Permittees	
24	PVID and BWD shall submit to the Department a map of the drains and canals that are routinely maintained as described in the section of the permit entitled "Non-Flow-Related Covered Activities." During the breeding season for Marsh Covered Species, PVID and BWD shall not perform maintenance of drains and canals in which submerged aquatic or emergent aquatic vegetation is present. However, PVID and BWD may, under emergency conditions, undertake the work reasonably necessary to prevent personal injury or property damage such as field flooding due to breaks in drains, bank sloughing, and clogged siphons.	Permit	Entire project	Permittees	
25	PVID and BWD will keep an annual running total of Marsh Covered Species habitat removed that will count towards the allowable removal acreage, and this information will be available upon Department request. PVID and BWD shall submit an annual status report to the Department by December 31st of each year. The annual status report must include the locations of drains and canals that have been maintained during the year, and acreage of habitat removed during the current year.	Permit	Entire project	Permittees	
26	Permittees shall cause to be created/restored, managed, and maintained 360 acres of new replacement Aquatic Covered Species breeding habitat ("Backwater Replacement Habitat") along the lower Colorado River in reaches 1-6. The Backwater Replacement Habitat shall be designed and managed to support breeding habitat for the Aquatic Covered Species. The Backwater Replacement Habitat shall meet the minimum requirements for achieving habitat creation objectives for each Aquatic Covered Species, as specified in Table 5-3 of the LCR MSCP HCP.	Permit	Entire project	Permittees	

	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
27	Permittees shall cause to be developed and implemented, in coordination with the Department, a comprehensive restoration, maintenance, monitoring, and reporting plan ("Backwater Replacement Habitat Management Plan") for each site used to create/restore the 360 acres of Backwater Replacement Habitat. The Permittees shall cause the Backwater Replacement Habitat Management Plan to be submitted to the Department within one year of site selection for each site for review and approval consistent with section 3(a)(v) of the permit for land within California, and for review and comment consistent with section 3(a)(iv) of the permit for land outside of California.	Permit	Within one year of site selection for each site	Permittees/	
28	Permittees shall cause to be developed and implemented, in cooperation with federal and state agencies, a comprehensive monitoring, research, and adaptive management plan (MRA Plan) for monitoring the effectiveness of, and adjusting as necessary, the measures to minimize and fully mitigate the impacts of the authorized take of the Aquatic Covered Species for which take is authorized. The Permittees shall cause the MRA Plan to be submitted to the Department within one year of permit issuance for review and approval consistent with section 3(a)(v) of the permit. Information collected as part of the MRA Plan will be used to determine the types and frequency of management actions that may be required to maintain habitat conditions (e.g., maintenance of desired backwater conditions over time).	Permit	July 5, 2006	Permittees	
29	Backwater Replacement Habitat will be monitored and adaptively managed over time to determine the types and frequency of management actions that may be required to maintain habitat conditions (e.g., maintenance of desired stand structure over time). The Permittees shall conduct surveys and research, as appropriate, to collect information necessary to better define the species' habitat requirements and to design and manage fully functioning Backwater Replacement Habitat.	Permit	Entire project	Permittees	
30	Creation/restoration of the Backwater Replacement Habitat within California shall be located in areas approved by the Department consistent with section 3(a)(v) of the permit with a minimum of 194 acres of the 360 replacement acres located within California in reaches 3, 4, 5, and/or 6. Backwater Replacement Habitat within California will be created to meet the schedule for establishment in Section 5.10 of the LCR MSCP HCP.	Permit	Entire project	Permittees	
31	Permittees shall cause the stocking of 660,000 razorback suckers (at least 12 inches in length) and 620,000 bonytail (at least 12 inches in length) in the LCR. At least 270,000 razorback suckers and 200,000 bonytail shall be stocked in reaches 4 and 5. Permittees shall cause to be developed and implemented, in cooperation with the Department, a "Fish Augmentation Plan" that sets forth stocking rates and locations, research and monitoring activities, conditions and criteria under which fish augmentation may cease, and alternative measures to minimize and fully mitigate for the authorized incidental take in the event that fish augmentation measures cease. The Permittees shall cause the Fish Augmentation Plan to be submitted to the Department for review and approval consistent with section 3(a)(v) of the permit.	Permit	As determined in the Fish Augmentation Plan	Permittees/ Department of Fish and Game	

	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
32	Permittees shall provide an endowment and enhancement fee of \$295.00 per acre (in 2005 dollars) to the Department for each acre of habitat that is transferred to the Department in fee title at the time of such title transfer, and for Department lands dedicated to the LCR MSCP. Interest from this amount shall be available for the operation, management and protection of the lands transferred to or owned by the Department, and may be spent on reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action designed to protect or improve the habitat values of the lands. The endowment principal shall not be drawn upon unless such withdrawal is deemed necessary by the Department to ensure the continued viability of the species on the lands. Monies received by the Department pursuant to this provision shall be deposited in a special deposit account established pursuant to Government Code §16370. The Department may pool the endowment with other endowments for the operation, management and protection of lands for local populations of the Covered Species. The Department shall manage any LCR MSCP land transferred to the Department in fee and for Department lands dedicated to the LCR MSCP, in compliance with and for the benefit of the LCR MSCP and consistent with the Department's mission statement.	Permit	At the time of transfer for land within California, and for Department land dedicated to the LCR MSCP	Permittees	
33	The permit may be amended as required by law if the Department determines that continued implementation of the Project under existing permit conditions would jeopardize the continued existence of a Covered Species or if the Department determines, after consultation with Permittees, that changed biological conditions necessitate a permit amendment to ensure that impacts to the Covered Species are minimized and fully mitigated.	Permit	Entire project	Permittees/ Department of Fish and Game	

Attachment 2

HABITAT MANAGEMENT LANDS ACQUISITION CHECKLIST

The following checklist is provided for your convenience and to expedite Department processing of your Habitat Management Lands acquisition proposal. This list indicates the appropriate real estate documents which must be provided to the Department of Fish and Game so that review and formal acceptance can be accomplished. Any land acquisition processing requests that are incomplete when received will be returned.

- Proposed Lands for Acquisition Form (PLFAF)  
(forward to Region for approval; Region will send to Realty Services Coordinator)
- Hazardous Materials Site Assessment Report  
(an existing report may be used, but it must be less than two years old)
- Preliminary Title Report(s) for subject property  
(an existing title policy is not acceptable)
- Grant Deed or Easement Deed  
(deed must be an original, signed and acknowledged, or a certified copy thereof)
- County Assessor Parcel Map(s) for subject property
- Site Location Map  
(site location with property boundaries outlined on a USGS 1:24, 000 scale Topographic Quadrangle Map)

The Region will forward the PLFAF to the Lands and Natural Areas Program (LNAP) Realty Services Coordinator and request that LNAP process the land acquisition for formal acceptance. With the exception of the PLFAF, all documents listed above should be submitted directly to the Realty Services Coordinator at the following address:

Mr. Richard Jackson  
Department of Fish and Game  
Lands and Facilities Branch  
1416 - 9th Street  
Sacramento, CA 95814

" For some transactions, additional documents may be required, such as documents to support title exceptions or to explain title encumbrances. These additional documents may be requested by the Realty Services Coordinator during his review.

" Please note that the Project Applicant is responsible for all land acquisition costs, including title document costs, escrow fees, recording fees, title insurance premiums, other escrow-related fees or costs, and costs incurred by the Department of Fish and Game and the Department of General Services in reviewing and approving the documents.

PROPOSED LANDS FOR ACQUISITION FORM ("PLFAF")

Date: \_\_\_\_\_

TO: Regional Representative  
\_\_\_\_\_  
\_\_\_\_\_

Facsimile: \_\_\_\_\_

FROM: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Applicant proposes that the following parcel of land be considered for approval by the Department as suitable for purposes of habitat management lands to replace the adverse environmental impacts of the Project:

<u>Section</u>	<u>Township</u>	<u>Range</u>	<u>Number of Acres</u>
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_____	_____	_____	_____
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Current Legal Owner(s)  
\_\_\_\_\_  
\_\_\_\_\_

Signature of legal owner(s) granting access rights to Department for biological review of land:

\_\_\_\_\_

Please check one:

This parcel is located within the \_\_\_\_\_

This parcel is not located within the \_\_\_\_\_

Explanation: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

APPROVED \_\_\_\_\_ By: \_\_\_\_\_ DATE: \_\_\_\_\_

REJECTED \_\_\_\_\_  
Region \_\_\_\_\_

Explanation: \_\_\_\_\_  
\_\_\_\_\_