CONSERVATION AGREEMENT

AMONG

THE BUREAU OF RECLAMATION, IMPERIAL IRRIGATION DISTRICT, COACHELLA VALLEY WATER DISTRICT, and SAN DIEGO COUNTY WATER AUTHORITY

This Conservation Agreement regarding implementation of a voluntary conservation plan for listed species in and around the Imperial Irrigation District, Coachella Valley Water District, and Salton Sea area is entered into this 10th day of October, 2003, among the United States Department of the Interior, Bureau of Reclamation (Reclamation), the Imperial Irrigation District (IID), the Coachella Valley Water District (CVWD), and the San Diego County Water Authority (SDCWA).

RECITALS

A. With the participation of IID, CVWD and SDCWA, Reclamation has initiated a voluntary program (the "Species Conservation Program") for the conservation of four species listed pursuant to the Endangered Species Act (ESA), Yuma clapper rail, desert pupfish, southwest willow flycatcher, and California brown pelican (the four species are referred to herein as the Listed Species), on lands comprising the approximately 500,000 acres of IID's service area in Imperial County, California, the Salton Sea (including adjacent areas in the Coachella and Imperial Valleys), lands owned by IID outside IID's service area that are currently submerged by the Salton Sea, the lower Colorado River Valley and the Coastal California range of wintering California brown pelicans (the "Conservation Area"). The Species Conservation Program is pursuant to Section 7(a)(1) of the ESA (16 U.S.C. §1536), which authorizes Reclamation to use its authorities to carry out programs for the conservation of endangered and threatened species.

B. Reclamation has authority in accordance with applicable federal law, including the ESA, to undertake a voluntary species conservation program for federally listed species in the Conservation Area.

C. IID, CVWD and the Metropolitan Water District ("MWD"), have negotiated a Quantification Settlement Agreement (QSA) that includes implementation of projects for the conservation of water that is presently used for agricultural purposes within IID and the transfer of the conserved water to CVWD, SDCWA, and MWD. IID, CVWD, SDCWA, and MWD have identified potential impacts that the QSA projects may have on endangered and threatened species in the Conservation Area. These potential impacts have been identified in the Biological Assessment prepared by Reclamation (July 2002) as revised through subsequent memoranda in October and December 2002 ("BA"), and submitted to the U.S. Fish and Wildlife Service

("Service"). After consultation between Reclamation and the Service, the Service issued a Biological Opinion dated December 18, 2002 ("BO").

D. IID has commenced the development of a habitat conservation plan ("HCP") in accordance with Section 10 of the ESA (16 U.S.C. §1539), the California Endangered Species Act ("CESA") and the California Natural Community Conservation Planning Act related to its activities, including the implementation of projects for the conservation of water identified in the QSA and activities related to and in furtherance of the QSA. The HCP is not expected to be completed for up to three years after the execution of the QSA, and IID, CVWD, and SDCWA desire to participate with Reclamation in the implementation of the Species Conservation Program for the purpose of obtaining incidental take authorizations pending completion of the HCP.

E. Reclamation has previously consulted with the Service regarding the effect on endangered and threatened species resulting from its federal actions (the changes in points of diversion from the Colorado River) related to the transfer of water through projects identified in the QSA, and the Service issued its Biological Opinion in January 2001. With the participation of IID, CVWD and SDCWA, Reclamation has developed this Species Conservation Program to meet the statutory and regulatory requirements for the issuance of incidental take authorization for the impacts to the Listed Species in the Conservation Area that may result from activities of IID, CVWD, and SDCWA relating to implementation of water conservation projects identified in the QSA, in accordance with the BA and the BO.

F. The QSA is subject to the implementation of a mechanism to resolve and allocate environmental mitigation responsibility between the Parties on the terms and conditions set forth in that certain Environmental Cost Sharing Agreement ("ECSA") among CVWD, IID, and SDCWA, attached hereto for informational purposes as Exhibit A. CVWD, IID, SDCWA and the State of California have also entered into that certain Quantification Settlement Agreement Joint Powers Agreement ("QSA JPA"), attached hereto for informational purposes as Exhibit B. Among other purposes, the QSA JPA (1) establishes a joint powers authority to fund the environmental mitigation requirements attributable to the QSA and related water transfers, (2) allocates among the State, CVWD, IID and SDCWA costs of environmental mitigation requirements; and (3) makes certain and limits the financial liability of CVWD, IID and SDCWA for environmental mitigation requirements.

G. CVWD, SDCWA and IID have agreed to substantial commitments of water, money and other valuable resources to implement the QSA, including but not limited to, this Agreement and other commitments of funds to mitigate environmental impacts of the QSA, the related water transfers and other related activities. CVWD, SDCWA and IID, individually and collectively, would not have made these commitments but for the commitments of the State in the QSA JPA.

H. This Conservation Agreement is entered into for the purpose of establishing the rights and obligations of the parties to implement the provisions of the Species Conservation Program.

WHEREFORE, in consideration of the recitals set forth above, the issuance and acceptance of incidental take authorizations pursuant to the Species Conservation Program, and the mutual promises set forth herein, the parties to this Conservation Agreement agree as follows:

AGREEMENT

Article 1
ESA Consultation

1.1 In accordance with the BA, Reclamation has consulted with the Service in accordance with Section 7(a)(2) of the ESA regarding the implementation of the Species Conservation Program. Reclamation prepared and submitted to the Service the BA described in Recital C, which identifies and analyzes the potential effects on endangered and threatened species in the Conservation Area resulting from projects for conservation of water identified in the QSA. The Service has issued the BO dated December 18, 2002 that includes a statement of the incidental take of threatened and endangered species that may result from the water conservation projects identified in the QSA within the Conservation Area. A copy of the BO is attached hereto as Exhibit C. The Service consulted with the California Department of Fish and Game ("CDFG") in connection with the measures required under the BO, in order to facilitate issuance of state permits pursuant to CESA.

1.2 Prior to any re-initiation of consultation regarding the Species Conservation Program or the projects for conservation of water identified in the QSA, Reclamation shall provide written notice to the other parties of the basis for re-initiation of consultation. The parties shall meet and confer to determine whether there are reasonable measures that may be taken to obviate the need to re-initiate consultation. In the event that there is a re-initiation of consultation with respect to the Species Conservation Program, Reclamation shall coordinate with the other parties in preparation of any biological assessment.

Article 2
Species Conservation Measures, Reasonable and Prudent Measures, and Terms and Conditions

2.1 The parties to this Conservation Agreement shall implement, or cause to be implemented: (1) the Species Conservation Program (which comprises the conservation measures set forth on pages 8 through 15 of the BO) (2) the reasonable and prudent measures (RPMs) set forth in the BO, and (3) the terms and conditions specified in the Incidental Take Statement ("ITS Terms and Conditions") portion of the BO.

Desert Pupfish

2.2 Each of the parties to this Conservation Agreement shall comply with the ITS RPMs and Terms and Conditions identified to minimize impacts to desert pupfish from the Species Conservation Program and the water conservation projects identified in the QSA.

2.3 Connectivity Impacts—Drains. IID and CVWD shall each be responsible for implementation of the provisions of Pupfish Conservation Measure 1 and the ITS Terms and Conditions Nos. 1.1, 3.1, 3.2, and 3.5 relating to maintenance of their respective drains connecting to the Salton Sea.

2.4 Connectivity Impacts-Refugium. The provisions of Pupfish Conservation Measure 1 and Terms and Conditions relating to creation of one pupfish refugium pond consistent with the Desert Pupfish Recovery Plan, as described in the BO, shall be implemented as follows:

Reclamation shall construct one refugium pond consistent with the Desert Pupfish Recovery Plan. Reclamation will coordinate with the other parties to this Conservation Agreement, the Service, and CDFG to determine the location, timing, and technique in implementing this measure. Reclamation shall bear the cost of siting and constructing the refugium pond and amounts expended by Reclamation shall be non-reimbursable for purposes of the Act of June 17, 1902 (43 U.S.C. §391 *et seq.*) and Acts amendatory thereof and supplemental thereto, and shall not be considered to be a supplemental or additional benefit for purposes of the Reclamation Reform Act of 1982 (43 U.S.C. §390aaa *et seq.*).

The party in whose service area the refugium pond is located (or IID if the refugium is located outside the service areas of the parties) shall manage and maintain the pond in accordance with Pupfish Conservation Measure 1 and shall be responsible for the implementation of the ITS Terms and Conditions Nos. 3.3 and 3.4 for the purpose of assisting in the recovery efforts for desert pupfish. It is not anticipated that these actions will entail construction of a new or replacement refugium pond or other actions that may interfere with normal agricultural operations.

2.5 Selenium Impacts. IID and CVWD shall be responsible for implementation of the provisions of Pupfish Conservation Measure 2 and the ITS Terms and Conditions Nos. 2.1 and 3.5 relating to impacts of selenium on desert pupfish.

2.6 Management and Monitoring. IID and CVWD shall be responsible for implementation of the provisions of Pupfish Conservation Measure 3 and the ITS Terms and Conditions Nos. 2.1, 4.1, 4.2, 4.3, and 4.8 relating to management and monitoring of desert pupfish.

Yuma Clapper Rail and California Black Rail

2.7 Each of the parties to this Conservation Agreement shall comply with the ITS RPMs and Terms and Conditions to minimize impacts to the Yuma clapper rail and California black rail from the Species Conservation Program and water conservation projects identified in the QSA.

2.8 Salinity Impacts. IID shall be responsible for implementation of the provisions of Rail Conservation Measure 1 and Terms and Conditions Nos. 2.2, 3.5, and 3.6 relating to the offset of potential salinity impacts to Yuma clapper rail and California black rail from the Species Conservation Program and water conservation projects identified in the QSA.

2.9 Selenium Impacts. IID shall be responsible for implementation of the provisions of Rail Conservation Measure 2 and the ITS Terms and Conditions 2.2, 3.5, and 3.6 relating to the offset of potential selenium impacts to Yuma clapper rail and California black rail.

2.10 Management and Monitoring. IID shall be responsible for implementation of the provisions of Rail Conservation Measure 3 and the ITS Terms and Conditions Nos. 4.4, 4.5, 4.6, 4.7, and 4.8 relating to management and monitoring of Yuma clapper rail and California black rail. IID, the other parties to the Conservation Agreement, the Service, and CDFG will annually review results of rail surveys and assess the effectiveness of the created marsh in providing habitat for clapper rails. In evaluating the effectiveness of the marsh in providing habitat for clapper rails, IID, the other parties to the Conservation Agreement, the Service, and CDFG will consider the use of the State and Federal refuges by clapper rails as compared to the created marsh. By considering and comparing use (occurrence, abundance, and life history functions) of the created marsh and at State and Federal refuges (if available), it will be possible to assess whether the created marsh is providing for the species, while at the same time taking into account stochastic factors not attributable to management. Management will be adjusted as necessary based on the results of the annual surveys.

Southwestern Willow Flycatcher

2.11 Evaluation of Habitat. Reclamation shall be responsible for implementation of Willow Flycatcher Conservation Measure 1 relating to the identification of suitable southwestern willow flycatcher breeding habitat, as follows:

Reclamation shall evaluate all cottonwood-willow and tamarisk stands that may potentially be affected by the QSA water conservation projects for southwestern willow flycatcher breeding habitat suitability. Using the Anderson and Ohmart classification system (1994), each Saltcedar III and IV and each Cottonwood-willow I, II, III, and IV stand will be evaluated for suitability based on density, structure, and presence of standing water or saturated soils during the breeding season. Suitable breeding habitat will be identified based on characterizations provided in the draft Southwestern Willow Flycatcher Recovery Plan.

Reclamation will perform these evaluations prior to any IID water conservation activities which could impact tamarisk habitat. Upon completion of this initial evaluation, a specific protocol for the habitat monitoring (identified below as voluntary Willow Flycatcher Conservation Measure 2) will be developed in consultation with the other parties to the Conservation Agreement, the Service, and CDFG. This protocol will address the timing and duration of monitoring activities and other details as required.

Reclamation shall bear the cost of performing these evaluations and amounts expended by Reclamation shall be non-reimbursable for purposes of the Act of June 17, 1902 (43 U.S.C. §391 *et seq.*) and Acts amendatory thereof and supplemental thereto, and shall not be considered to be a supplemental or additional benefit for purposes of the Reclamation Reform Act of 1982 (43 U.S.C. §390aaa *et seq.*). Each party shall bear its own cost for participating in the reviews and discussions with the Service and CDFG regarding development of the protocol for habitat monitoring.

2.12 Suitable Habitat Monitoring and Management. Each party whose service area includes suitable southwestern willow flycatcher breeding habitat, as identified by Reclamation pursuant to Willow Flycatcher Conservation Measure 1, shall be responsible for implementation of the provisions of Willow Flycatcher Conservation Measure 2 relating to monitoring the habitat and quantifying changes in quantity and quality of the habitat within their service area and Willow Flycatcher Conservation Measure 3 relating to the management and monitoring of replacement habitat for southwestern willow flycatcher within their service area.

2.13 Take Minimization During Construction. IID shall be responsible for implementation of the provisions of Willow Flycatcher Conservation Measure 4 relating to the avoidance of construction impacts to southwestern willow flycatcher along the East Highline Canal and lateral interceptors.

California Brown Pelican

2.14 Roost Site Creation. IID, in cooperation with SDCWA and CVWD, shall be responsible for implementation of Brown Pelican Conservation Measure 1 and ITS Terms and Conditions Nos. 3.5 and 3.7 relating to the creation of coastal roost sites for California brown pelicans. The California Department of Fish and Game has indicated that it may assume responsibility for implementation of Brown Pelican Conservation Measure 1 and ITS Terms and Conditions Nos. 3.5 and 3.7 relating to the creation of coastal roost sites for California brown pelicans. If the California Department of Fish and Game fails to assume that responsibility, IID, in cooperation with SDCWA and CVWD, shall remain responsible for those measures. IID, in cooperation with the other parties to the Conservation Agreement, shall be responsible for the implementation of Terms and Conditions Nos. 1.2, 3.5, and 3.7 relating to the creation of roost structures in and around the Salton Sea.

Article 3
General Provisions

3.1 IID, SDCWA, and CVWD acknowledge that they are each required to provide funds to pay certain mitigation costs pursuant to the ECSA and the QSA JPA, including their respective costs incurred pursuant to this Conservation Agreement. Notwithstanding any provision of this Agreement, the Species Conservation Program or the BO, IID, SDCWA, and CVWD, individually and collectively, shall not be required to pay, or contribute to the payment of, or incur any costs or expenses related to the implementation of this Agreement, except to the extent and as provided in the ECSA and the QSA JPA. Without limiting the generality of the foregoing, IID, SDCWA, and CVWD are not required to pay or incur any costs or expenses attributable to the implementation of this Agreement in an amount that would exceed the limitations attributable to such agencies, individually and collectively, in the ECSA and the QSA JPA. IID, as the CEQA Lead Agency for the IID Water Conservation and Transfer Project, shall have the right to rely upon the commitments of the parties set forth in the Conservation Agreement, the ECSA and the QSA JPA to perform and/or fund the Species Conservation Program.

3.2 The party with responsibility for implementation of each conservation measure adopted in the BO and each ITS Term and Condition shall perform its obligations in a timely manner and with the frequency required.

3.3 Notwithstanding the allocation of responsibility for implementation, each party may participate, at its own cost, in any discussions with the Service and CDFG regarding each conservation measure or ITS Term and Condition. To ensure the opportunity for such participation, each party shall give reasonable notice to the other parties of any planned or scheduled discussions with the Service and CDFG regarding each matter governed by this Conservation Agreement.

3.4 Each party that is required to prepare any report, plan or other document to implement any conservation measure or ITS Term and Condition shall provide a copy of each report, plan or other document to the other parties within a reasonable time after its preparation.

3.5 Reimbursement of all costs and expenses incurred by IID, CVWD, or SDCWA shall be made in accordance with the provisions of the ECSA and the QSA JPA.

3.6 Upon the completion of an HCP, if any, that provides incidental take authority for the same water conservation projects identified in the QSA that are covered by the BO, the parties shall meet and confer in good faith to identify duplicative conservation measures and ITS Terms and Conditions that are required by both the BA/BO and the HCP. By written agreement executed by all of the parties to this Conservation Agreement, the rights and obligations for implementation and funding of each identified duplicative conservation measure, or Term and Condition may be re-assigned to avoid duplication, consistent with the parties' obligations under the ECSA and the QSA JPA.

3.7 Any notice that is authorized or required to be given pursuant to this Conservation Agreement shall be delivered by first class mail, postage prepaid, as follows:

Reclamation	Area Manager, Boulder Canyon Operations Office Attn: Ms. Jayne Harkins U.S. Bureau of Reclamation P.O. Box 61470 Boulder City, Nevada 89006-14
IID	Imperial Irrigation District Attn: Tina Shields P. O. Box 937 Imperial, CA 92251
CVWD	Coachella Valley Water District Attn: Steve Robbins P. O. Box 1058 Coachella, CA 92236

SDCWA

San Diego County Water Authority
Attn: Larry Purcell
4677 Overland Avenue
San Diego, CA 92123

Any party may change the address to which notices are to be sent by giving written notice of such change to the other parties in accordance with this paragraph.

3.8 Nothing in this Conservation Agreement shall affect the rights and obligations of the parties under other agreements governing the implementation of conservation measures for impacts to endangered and threatened species on the Colorado River resulting from water transfer projects identified in the QSA.

Article 4
Commencement and Termination

4.1 This Conservation Agreement shall become effective only upon the execution by all parties of this Conservation Agreement, and execution by the United States District Court for the Southern District of California of the Stipulation and Order dismissing the case IID v. United States et al., Case No. 03-CV-0069W(JFS).

4.2 The obligations of each party under this Conservation Agreement to implement or finance the conservation measures and ITS RPMs and Terms and Conditions, shall be effective only to the extent that the BO issued by the Service remains in effect and includes a statement of the incidental take, if any, that will result from the action. The statement of the incidental take shall include any incidental take of Listed Species that is likely to result from the water conservation projects identified in the QSA.

4.3 In the event that any party fails to timely or properly implement the BO's conservation measures and ITS Terms and Conditions for which the party is responsible, any other party may, after giving reasonable notice and opportunity to perform, undertake to implement those measures. In the event that IID, CVWD, and SDCWA fail to perform an obligation of any of them after written notice to each from Reclamation and a reasonable time for them to perform, Reclamation shall have no further responsibility to perform its obligations under this Conservation Agreement.

4.4 This Conservation Agreement shall automatically terminate in the event of a termination of the Colorado River Water Delivery Agreement pursuant to paragraphs 6(b) and (c) therein.

4.5 In the event of a termination pursuant to this Article, each party shall remain liable to meet any obligations that were incurred pursuant to this Conservation Agreement prior to the effective date of the termination consistent with the parties' obligation under the ECSA and the QSA JPA.

IN WITNESS WHEREOF, the parties have executed this Conservation Agreement as of the date first written above.

Reclamation — United States Department of the Interior, Bureau of Reclamation

By _____
Name
Title

IID — Imperial Irrigation District

By _____
Name
Title Chief Counsel

CVWD — Coachella Valley Water District

By _____
Name
Title GENERAL MANAGER

SDCWA — San Diego County Water Authority

By _____
Name
Title General Manager

United States Department of the Interior

BUREAU OF RECLAMATION
Lower Colorado Regional Office
P.O. Box 61470
Boulder City, NV 89006-1470

IN REPLY REFER TO:
BCOO-1000
ENV-7.00

DEC 19 2002

Mr. Ronald R. Gastelum
Chief Executive Officer
The Metropolitan Water District
of Southern California
PO Box 54143
Los Angeles, California 90054-0153

Subject: Final Fish and Wildlife Service Biological Opinion on Reclamation's Proposed Section 7(a)(1) Conservation Measures for Listed Species in the Imperial Irrigation District/Salton Sea Areas

Dear Mr. Silva

I am pleased to provide you a copy of the subject final Biological Opinion (BO). This completes the Section 7 consultation initiated by Reclamation in July of this year and provides Endangered Species Act compliance for the water transfer between Imperial Irrigation District and the San Diego County Water Authority. We appreciate the cooperative effort of all parties in completing the consultation. The document is now available to be forwarded to the California Department of Fish and Game for their consideration of a consistency determination to achieve compliance with the California Endangered Species Act. We view this as a significant milestone in completing the required activities for implementation of the California Plan and the Quantification Settlement Agreement (QSA). We remain hopeful that execution of the QSA can still be achieved by the end of this year.

Sincerely,

Robert W. Johnson
Regional Director

Enclosure

Identical Letter Sent to:

Mr. Tom Levy
General Manager
Coachella Valley Water District
P.O. Box 1058
Coachella, California 92236

Ms. Maureen Stapleton
General Manager
San Diego County Water Authority
4677 Overland Avenue
San Diego, California 92123

Mr. Jesse Silva
General Manager
Imperial Irrigation District
PO Box 937
Imperial CA 92251

cc: Mr. Tom Hannigan
Director
Department of Water Resources
State of California,
1416 Ninth Street
Sacramento, California 95814

Mr. Jim Bartel
Field Supervisor
U.S. Fish and Wildlife Service
2730 Loker Avenue
West Carlsbad, California 93208

Mr. Gerald Zimmerman
Executive Director
Colorado River Board of California
770 Fairmont Avenue, Suite 100
Glendale, California 91203
(w/cy encl to ea)

Mr. Steve Thompson
United States Fish and Wildlife Service
2800 Cottage Way, Suite W-2606
Sacramento, California 95825

Mr. Robert C. Hight
Director
Department of Fish and Game
1416 Ninth Street, Sacramento, California 95814
(w/e-mail encl to ea)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road
Carlsbad, California 92009

In Reply Refer to: FWS-IMP-2628.10

DEC 1 8 2002

MEMORANDUM

To: Regional Director, Lower Colorado Region,
Bureau of Reclamation, Boulder City, Nevada

From: Assistant Field Supervisor, Carlsbad Fish and Wildlife Office,
Fish and Wildlife Service, Carlsbad, California

Subject: Draft Biological Opinion on the Bureau of Reclamation's Voluntary Fish and Wildlife Conservation Measures and Associated Conservation Agreements with the California Water Agencies

This document transmits the Fish and Wildlife Service's (Service) biological opinion for the proposed Bureau of Reclamation (Reclamation) Voluntary Fish and Wildlife Conservation Measures and associated conservation agreements to be entered into by Reclamation and the California water agencies, and their effects on the federally listed species, and their designated critical habitat where applicable, in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The voluntary fish and wildlife conservation measures are being implemented as part of Reclamation's existing authorities pursuant to section 7(a)(1) of the ESA. The California water agencies have offered to enter into conservation agreements with Reclamation to implement these measures to help offset the impacts of the water conservation and transfer activities necessary to implement the California Plan for the Colorado River discussed below. Therefore, this document will also provide an analysis of the interrelated effects of the Imperial Irrigation District (IID) water conservation activities necessary to provide for the transfer of water from IID to the San Diego County Water Authority (SDCWA), Coachella Valley Water District (CVWD) and Metropolitan Water District of Southern California (MWD) as called for in that plan.

We received your July 23, 2002, memorandum requesting formal consultation on July 25, 2002. The following species were included in the Biological Assessment:

desert pupfish	*Cyprinodon macularius*	Endangered (E), with Critical Habitat (CH)
Yuma clapper rail	*Rallus longirostris yumanensis*	E
southwestern willow flycatcher	*Empidonax traillii extimus*	E

least Bell's vireo	*Vireo bellii pusillus*	E, CH
California brown pelican	*Pelecanus occidentalis*	E
bald eagle	*Haliaeetus leucocephalus*	Threatened (T)
California least tern	*Sterna antillarum browni*	E
razorback sucker	*Xyrauchen texanus*	E, CH
mountain plover	*Charadrius montanus*	Proposed T
California black rail	*Laterallus jamaicensis coturniculus*	State T

This biological opinion is based on information provided in: (1) Biological Assessment (BA) and subsequent Errata for the above proposed project developed by Reclamation, (2) Environmental Impact Report, including draft Habitat Conservation Plan developed by the IID, and (3) other existing information in the Service's files. A complete administrative record of this consultation is on file at the Service's Carlsbad Fish and Wildlife Office.

As a result of our review of the proposed fish and wildlife conservation measures and the interrelated effects of the water conservation activities, we have determined that some of these species are not likely to be adversely affected. The Service anticipates that the proposed fish and wildlife conservation measures and IID's water conservation activities are not likely to adversely affect the southwestern willow flycatcher, least Bell's vireo, bald eagle, California least tern, and razorback sucker for the reasons described below. No additional discussion of these species is included herein. We are including a discussion of the California black rail (*Laterallus jamaicensis coturniculus*) for the purposes of technical assistance.

Although the fish and wildlife conservation measures and the interrelated effects of the water conservation activities may affect the southwestern willow flycatcher, adequate migration resources will remain in the Salton Trough to meet this species' migration needs. Given that this species is not currently known to breed in the area but that Reclamation and its conservation agreement partners propose to offset losses of suitable breeding habitat that result from the water conservation activities, we concur with Reclamation's conclusion that the proposed fish and wildlife conservation measures and the interrelated effects of IID's water conservation activities may affect, but are not likely to adversely affect, the southwestern willow flycatcher.

Although the fish and wildlife conservation measures and the interrelated effects of the water conservation activities may affect the least Bell's vireo, adequate migration resources will remain in the Salton Trough to meet this species' migratory needs. Given that this species is not currently known to breed in the area and records of its use of the area are limited, we have determined that the proposed fish and wildlife conservation measures and the interrelated effects of IID's water conservation activities are not likely to adversely affect the least Bell's vireo.

The bald eagle has been observed at the Salton Sea irregularly in the winter months and is not known to nest there. The anticipated water conservation-related changes in Salton Sea salinity could affect fish availability. However, the low numbers of birds recorded using the Salton Sea (1-3/year) suggest that the bald eagle is not dependent on the Salton Sea during winter migration. Fish are expected to continue to be available to a more limited extent at the river deltas and other smaller lakes in the Imperial Valley (Fig Lagoon, Finney and Ramer Lakes, Wiest Lake, and

Sunbeam Lake) in addition to the waterfowl available in winter at the State and Federal wildlife refuges and the many duck clubs present in the Imperial Valley. No impacts are anticipated as a direct result of on-farm or system water conservation activities. Given the anticipated long-term availability of forage in the area and the low number of bald eagles expected to be present, the proposed fish and wildlife conservation measures and the interrelated effects of IID's water conservation activities may affect but are not likely to adversely affect the bald eagle.

The least tern has been observed irregularly at the Salton Sea. Because the numbers of least terns that have been recorded at the Salton Sea are very low (fewer than 10 records at the Sonny Bono Salton Sea NWR), it does not appear that the California least tern is dependent upon the Salton Sea as a migratory stopover. It is unlikely that the increase in salinity and corresponding loss of fish associated with the interrelated effects of the water conservation activities would adversely affect the California least tern. We anticipate that some fish will continue to be available at the mouths of the rivers and drains. Based on this information, we have determined that the proposed fish and wildlife conservation measures and the interrelated effects of IID's water conservation activities may affect but are not likely to adversely affect the California least tern.

The razorback sucker is only expected to be found in the main delivery canals and storage reservoirs within the Imperial Valley. Although the total flows in the main canals will be reduced, elevation is tightly controlled to maximize hydro-electric power generation and water delivery efficiency. The only canal lining planned for water conservation involves the smaller lateral canals. There are no records of razorback suckers being found in the smaller lateral canals. As no physical modifications are planned to the main canal and reservoir facilities that are known to be used by razorback suckers as part of the water conservation and transfer program and the changes in flows in the main canals are expected to be minor, no adverse impacts to this species are anticipated. We concur with Reclamation's conclusion that the proposed fish and wildlife conservation measures and the interrelated effects of IID's water conservation activities may affect but are not likely to adversely affect the razorback sucker. The lining of the All American Canal has been addressed through a separate consultation process and is not included in this analysis.

In Reclamation's BA a conclusion was provided that the proposed fish and wildlife conservation measures and the interrelated effects of IID's water conservation activities may affect but are not likely to adversely affect the mountain plover. Reclamation has withdrawn this conclusion through the comments provided on the draft biological opinion. Therefore, we will not be conferencing on this species. Should an incidental take exemption be required as a result of a future listing of the mountain plover for any impacts associated with the proposed fish and wildlife conservation measures and/or interrelated effects of IID's water conservation activities, Reclamation will need to re-initiate consultation under section 7 of the ESA with the Service.

CONSULTATION HISTORY

A complete history of the Carlsbad Fish and Wildlife Office's participation in this process can be found in Attachment D.

Reclamation functions as the Water Master of the Colorado River on behalf of the Secretary of the Interior. In this capacity, Reclamation is responsible for the management of the use of the Colorado River by the various water rights holders throughout the Colorado River states. The Colorado River is divided into upper and lower basins for operational purposes. Operation of the lower Colorado River, from Pierce Ferry to the Southerly International Boundary, was addressed in a biological opinion from the Service dated April 30, 1997. By operation of contracts for permanent water delivery service executed in the 1930's, any unused Colorado River water by a seniority priority holder within California's allocation is directed to the next junior user. Thus, in Southern California, the Secretary is without the authority to direct unused Colorado River water by a contractor to any other purpose other than the next contractor in priority.

In an effort to prepare for likely reductions of Colorado River water available to California, the Colorado River Board of California prepared the California Plan, which was released in draft form in May 2000 and is available for public review at www.crb.water.ca.gov/reports.htm. The California Plan provides a framework for the State to coordinate and assist in the cooperative implementation of diverse programs, projects, and other activities that would reduce California's use of Colorado River water and facilitate conformance with California's annual apportionment. It involves the conservation of water in southern California and the transfer of conserved water from agricultural to predominantly urban uses. The proposed Quantification Settlement Agreement (QSA) is designed to include key contractual arrangements among IID, MWD, and CVWD, which are needed to implement major components of the California Plan.

The Service initially met with Reclamation, IID and SDCWA to discuss the transfer on January 6, 1999. This initial meeting was the introduction to the proposed project for the Service. A second meeting occurred on February 19, 1999, which focused on the issues of Endangered Species Act (ESA) compliance through section 7 versus section 10, direct and indirect impacts in the Imperial Valley and San Diego County, and the California 4.4 Plan. On December 7, 1999, the Service began regular meetings with IID to begin the development of the Habitat Conservation Plan (HCP) to address all impacts within the Imperial Valley, the Salton Sea, and along the All-American Canal (exclusive of canal lining activities). The lower Colorado River species were also discussed.

From February - August 2000, the Service had monthly meetings with IID to provide guidance on their development on the HCP. On September 13, 2000, IID indicated that they should be ready to submit the HCP to the resource agencies by the end of November or first of December. On November 6, 2000, an amended Notice of Intent was published by Reclamation in the Federal Register to address coverage of permit issuance in the draft EIR/EIS. A 30-day comment period followed during which the Service received three comment letters.

As a result of proposed adoption of the Interim Surplus Guidelines and the change in point of diversion of up to 400,000 acre-feet per year of Colorado River water, Reclamation consulted with the Service on endangered species impacts in 2000. On January 12, 2001, the Service's Phoenix Fish and Wildlife Office issued their biological opinion to Reclamation, which covered the Interim Surplus Criteria, the Secretarial Implementation Agreements and Biological Conservation Measures to be implemented in association with the proposed modifications in river operations, including the change in point to diversion for the water to be transferred to San Diego County Water Authority.

That document provides incidental take to Reclamation for their actions on the lower Colorado River that are required to implement the water transfer as part of the California 4.4 Plan. Indirect effects of the transfer in receiving areas were discussed in the document. Incidental take has already been provided in some areas through regional HCPs. Incidental take in areas not covered by regional HCPs was deferred to coverage as future projects are developed. Incidental take in the Imperial Valley and Salton Sea was to be addressed in IID's HCP, and incidental take associated with the use of the water by CVWD was to be covered by participation in a regional Coachella Valley HCP, or their own HCP.

Beginning in April of 2001 through May of 2002 (see the Attachment D for details), the Service and the California Department of Fish and Game (CDFG) were involved in intensive discussions with IID on the HCP. Meetings were scheduled weekly for two days to try to resolve issues associated with the HCP. While significant progress was made on the Imperial Valley portions of the HCP, significant uncertainty remained with the approaches being considered for the Salton Sea fish-eating bird species. Given the short time frame remaining, Reclamation determined in July of 2002 that it did not appear to be feasible to complete the HCP and permitting process by December 31, 2002. Recognizing the need for incidental take coverage in the absence of a HCP/section 10 (a)(1)(b) permit, Reclamation has developed a set of fish and wildlife conservation measures to be undertaken by Reclamation and/or its conservation agreement partners for listed species as called for under section 7(a)(1) of the ESA. The desert pupfish, Yuma clapper rail, southwestern willow flycatcher and California brown pelican were to be addressed. Reclamation then began developing the BA including the proposed fish and wildlife conservation measures along with the interrelated water conservation and transfer activities. Under this process CDFG would have the opportunity to determine whether the BA and biological opinion are compatible with the State's permitting process. IID is responsible for maintenance issues, which will need to be addressed separately as such issues are not part of this action and are outside the scope of this consultation.

On July 25, 2002, the Service received Reclamation's request for initiation of formal consultation (dated July 23, 2002) along with a BA for Reclamation's proposed voluntary fish and wildlife conservation measures.

The Service, Reclamation, and CDFG met on August 22, 2002, to discuss the BA. We discussed the proposed measures for the Yuma clapper rail and the southwestern willow flycatcher at length. The California black rail will be added to the BA. The acreage of marsh mitigation already included for the Yuma clapper rail is believed to be conservative enough to include them given the salinity acreage is based on the most sensitive vegetation and the selenium acreage was based on total vegetated acres. The mountain plover needs additional analysis to reflect its specific habitat preferences and the possibility that only hay crops may be fallowed. The Service, Reclamation and CDFG re-convened on August 29-30, 2002, to continue the discussion on the BA. We went on to discuss the desert pupfish. The lack of a refugium pond appeared to be the largest gap relative to what had been agreed to in the HCP. Reclamation agreed to add this to the first measure for pupfish. Reclamation agreed to several changes to the BA to address Service and CDFG concerns. Language will be incorporated from the HCP to indicate more specifically what monitoring will be required, and a requirement for a monitoring plan that is approved by the Service and CDFG will be added. The Service suggested that the document needed additional clarification on how it was

decided that species would be included or not included in the different levels of analysis. Reclamation agreed to re-evaluate the language that is currently in the document and add details as needed. We briefly discussed other more general comments. Reclamation agreed to evaluate our comments and incorporate changes as appropriate. The consultation period officially closed October 23, 2002, and Reclamation provided an updated project description to the Service on that date. Through a brief phone conversation with Bruce Ellis of Reclamation on October 23, 2002, the addition of rail surveys to Rail Measure 3 and the word "monthly" to the sentence on brown pelican surveys in Brown Pelican Measure 1 were approved.

A conference call was held on November 27, 2002, to discuss the remaining outstanding issues in the consultation. In that discussion the Service informed Reclamation that we did not concur with Reclamation's conclusion that the proposed fish and wildlife conservation measures and the interrelated effects of IID's water conservation activities may affect, but are not likely to adversely affect, the mountain plover. We had determined that the water conservation activities were likely to adversely affect this species as a result of the loss of up to 80,500 acres (1/3 of the acreage) of preferred crop types (alfalfa and Bermuda grass). The North American population of the mountain plover has been estimated at 9,000 birds (Brown *et al.* 2001). Wunder and Knopf (in press) surveyed wintering mountain plovers in Imperial Valley from 9-19 January 2001, and they recorded 4,037 plovers in 36 flocks ranging in size from 4 to 596 birds. This is believed to be nearly half of the current population (Fritz Knopf, USGS, pers. comm.), suggesting a recent shift in use from California's Central Valley and making the Imperial Valley the most important wintering area for this species. Because of the high dependence of this species on appropriate field types for foraging in the Imperial Valley, large decreases in the acreage of the preferred crop types may interfere with the survival and recovery of the species. The specific acreage requirements for wintering mountain plovers have not been determined, so it is not possible to quantify the impacts to individual plovers at this time. Therefore, it would not be possible to complete a conference opinion for this species.

We relayed to Reclamation that in order to properly evaluate the potential effects of the proposed conservation measures and the potential interrelated effects, it would be necessary to determine the winter habitat requirements for this species in the Imperial Valley and consider the effects of the proposed fish and wildlife conservation measures and the interrelated effects of IID's water conservation activities in that context. Ongoing monitoring of the mountain plover population, identification of its specific wintering habitat requirements and quantification of the available foraging habitat in the Imperial Valley would be required to quantify the impacts associated with the proposed conservation measures and the interrelated effects of the water conservation activities and to prevent a level of loss of their foraging habitat to an extent that survival and recovery of this species could be impacted. In their comments on the draft biological opinion transmitted to the Service on December 9, 2002, Reclamation withdrew their request for conference on this species. They withdrew their determination that the proposed fish and wildlife conservation measures and interrelated water conservation activities were not likely to adversely affect the mountain plover and the voluntary conservation measure that they had provided in their program for this species.

DESCRIPTION OF THE PROPOSED ACTION

In the biological opinion issued by the Service in January 2001, an evaluation of direct and indirect effects of the California 4.4 plan anticipated that effects on listed species within the IID Service area and Salton Sea would be addressed through a Habitat Conservation Plan (HCP) being developed at that time by IID. Because of the complexity of the issues associated with the HCP, it became necessary to use an alternative approach for ESA compliance to meet the deadline for execution of the QSA of December 31, 2002. Reclamation developed the alternative approach to ESA compliance via section 7 described below so that execution of the QSA could proceed on December 31, 2002 as scheduled. If the QSA is not implemented, Reclamation may chose not to undertake the proposed fish and wildlife conservation measures. The QSA has been amended to provide an additional year for completion of the HCP that would cover a broader array of species and additional activities in the Imperial Valley including operations and maintenance. The incidental take exemption provided by this biological opinion will remain in effect for Reclamation and the California water agencies with which it has executed conservation agreements as long as Reclamation and its conservation agreement partners implement the fish and wildlife conservation measures as described in this project description and the terms and conditions of the Incidental Take Statement provided below. This biological opinion shall remain in effect for the duration of the water conservation and transfer program unless the California water agencies provide a HCP that addresses the federally-listed species in and around the Salton Sea and the incidental take associated with the proposed fish and wildlife conservation measures and water conservation activities is permitted through a section 10(a)(1)(B) incidental take permit.

Conservation Measures

The Proposed Action is implementation of voluntary fish and wildlife conservation measures in conjunction with non-federal parties designed to conserve listed species found in the area of the Salton Sea (including adjacent areas in the Coachella and Imperial Valleys). The proposed voluntary fish and wildlife conservation measures are designed, in part, to avoid, minimize, and offset impacts of IID's water conservation activities on federally listed species. Reclamation proposes to implement the proposed fish and wildlife conservation measures, either separately or cooperatively with some or all of the QSA beneficiaries (IID, SDCWA, CVWD, and MWD) in the State of California as partners. Specific conservation agreements for implementation of the fish and wildlife conservation measures will be developed with willing partners during the consultation period, and actual execution of the agreements will occur prior to the issuance of a Record of Decision (ROD) by Reclamation. Reclamation currently anticipates that the majority of the fish and wildlife conservation measures will be carried out by the California water agencies. Habitat-based and species-specific fish and wildlife conservation measures are proposed. Habitat-based measures are designed to offset the potential loss of habitat values (quantity and quality) with an overall objective of maintaining or increasing, where possible, the value (amount and/or quality) of each habitat used by federally listed species addressed in the voluntary fish and wildlife conservation program (e.g., drain, tamarisk scrub, and Salton Sea habitats) consistent with Reclamation's section 7(a)(1) responsibilities.

Reclamation and its conservation agreement partners will meet with the Service and CDFG within 90 days of the issuance of Reclamation's ROD to determine a schedule for the development of the management and monitoring plans and the implementation of the voluntary fish and wildlife conservation measures described below.

Desert Pupfish

Various surveys conducted by the CDFG and others have recorded the presence of desert pupfish in many of IID's drains that discharge directly to the Salton Sea (Sutton 1999). Although IID routinely maintains adequate drainage in these channels by removing vegetation and sediment, these drains provide the habitat conditions (e.g., water quality, food source, and aquatic vegetation) necessary to support pupfish. Implementation of water conservation activities by IID has the potential to degrade water quality in the drains occupied by pupfish.

The intent of the desert pupfish conservation measures is to maintain viable populations in the action area by maintaining or increasing pupfish habitat in IID's drains relative to current levels (i.e., no net loss) and maintaining connectivity among drain populations.

1. Minimize the impacts of potential increases in Salton Sea salinity concentrations on pupfish habitat by maintaining connectivity among drains (Pupfish Conservation Measure 1)

2. Minimize the impacts of potential increases in selenium concentrations and possible other contaminants in the drainage system resulting from water quality changes (Pupfish Conservation Measure 2)

Pupfish Conservation Measure 1: Connectivity Impacts

In cooperation with its conservation agreement partners, Reclamation will ensure that an appropriate level of connectivity is maintained between pupfish populations in individual drains (in CVWD's area at the north end of the Salton Sea and in IID's area at the south end of the sea) connected to the Salton Sea either directly or indirectly and that drain habitat below the first check will be maintained in the event that conditions in the Salton Sea become unsuitable for pupfish. Reclamation and its conservation agreement partners will undertake planning and studies so that before the salinity of the Salton Sea reaches 90 ppt (or lower as determined by the Service and CDFG), or physical barriers impede pupfish movement, the parties can implement a detailed plan for ensuring genetic interchange among the pupfish populations in the drains.

In cooperation with its conservation agreement partners, Reclamation will maintain the amount of potential pupfish drain habitat (expressed as linear channel distance) over the term of IID's water conservation and transfer project. This will be accomplished as the Sea recedes by extending or modifying existing IID and CVWD drains or by maintaining the suitability of naturally created drain channels. The design, configuration, and management of these areas will be developed jointly with Reclamation, Service and CDFG staff, and will be developed in consideration of the specific physical characteristics of pupfish habitat (e.g., water depth and velocity, and channel width) and water quality (e.g., turbidity and selenium concentration). These extended or modified drains will

be monitored beginning with the first extension or modification and continuing for the term of the proposed fish and wildlife conservation measures and interrelated water conservation activities. If pupfish use of these areas cannot be established within 5 years, Reclamation and its conservation agreement partners will work with the Service and CDFG to determine the potential cause(s) for pupfish absence. Reclamation and its conservation agreement partners, in coordination with the Service and CDFG, will implement actions in the management, operation or maintenance of the extended or modified drains that are appropriate to correct conditions that are causing the absence of the pupfish. These actions may entail minor adjustments to the channel configuration (channel and pool depths, flow velocity, connectivity, and turbidity), vegetation management, and timing of scheduled maintenance. It is not anticipated that these actions will entail construction of new or replacement drain habitat, require supplemental flows in the drains, or other actions that may interfere with normal agricultural operations. Once pupfish presence is confirmed, monitoring will continue as per Pupfish Conservation Measure 3.

Reclamation, in cooperation with its conservation agreement partners, also will construct and maintain one refugium pond consistent with the Desert Pupfish Recovery Plan. This pond will be maintained for the purpose of assisting in the recovery efforts for that species. The parties will work with the Service and CDFG to determine the location, timing, and technique in implementing this measure. After pupfish have been stocked into the refugium pond, it will be monitored for 5 years to determine if successful reproduction is occurring. If successful reproduction is not occurring, Reclamation and its conservation agreement partners will meet with the Service and CDFG within 6 months to determine the potential cause(s) for the failure of pupfish to reproduce in the refugium. Reclamation and its conservation agreement partners, in coordination with the Service and CDFG, will implement actions in the management, operation or maintenance of the refugium that are appropriate to correct conditions that are causing the failure of the pupfish to reproduce. These actions may entail minor adjustments to the pond configuration (pool depth and shoreline complexity), vegetation management, and timing of scheduled maintenance. It is not anticipated that these actions will entail construction of a new or replacement refugium pond or other actions that may interfere with normal agricultural operations.

Pupfish Conservation Measure 2: Selenium Impacts

Reclamation and its conservation agreement partners will commit to fund a study program to determine the impacts of selenium on desert pupfish. The objective of the study program will be to identify specific selenium thresholds at which pupfish survival or reproduction is adversely affected. These studies will include water-borne exposures but will focus on dietary exposures as dietary exposure is believed to be of greater importance in how selenium-induced effects are manifested in fish. The thresholds will be expressed in terms of tissue concentration, water concentration, or dietary concentration as appropriate based on the study results. In addition to evaluating the effects of selenium on pupfish, the study program also may investigate the appropriateness of using another fish species (e.g., sailfin molly, *Poecilia latipinna*) as a surrogate species for the desert pupfish. This will facilitate long-term monitoring by maximizing the ability to interpret the results of chemical analyses of samples collected in the pupfish drains. Sufficient funding will be provided to support the completion of the study program and identification of a selenium threshold within 7 years. A detailed study plan will be developed in cooperation with the Service and CDFG.

Concurrently, Reclamation and its conservation agreement partners will implement a monitoring program to establish baseline conditions in the drains in the Imperial Valley that discharge directly to the Salton Sea. The monitoring program will include selenium concentrations in water, sediments, and dietary components of the desert pupfish. If the study program includes the investigation of possible surrogate species, collections of the surrogate species will be made to determine tissue concentrations of selenium in these fish. In addition, pupfish presence will be monitored (see Pupfish Conservation Measure 3). A detailed monitoring plan will be developed in cooperation with the Service and CDFG.

Within 2 years of completion of the study program, Reclamation and its conservation agreement partners will meet with the Service and CDFG to review the results of the study program and the monitoring data. If the available information reviewed in this process indicates that the pupfish inhabiting the Imperial Valley drains that discharge directly to the Salton Sea are at risk from selenium, Reclamation will work in cooperation with IID, the Service and CDFG to identify and implement the best means for managing IID's drain channels to minimize potential selenium impacts on pupfish. Measures to be considered may include splitting combined drain channels (drain/operational water) to improve water quality, providing limited biological treatment, including use of discharge from created managed marsh habitat described below, and consolidating channels and blending flows.

Pupfish Conservation Measure 3: Management and Monitoring

In cooperation with its conservation agreement partners, Reclamation will carry out routine monitoring of pupfish presence to confirm continued presence in the drains and to develop information useful in adjusting management actions for this species. In cooperation with the Service and CDFG, Reclamation and its conservation agreement partners will develop a survey protocol that is appropriate for determining pupfish presence in the drains. As part of the baseline monitoring program, Reclamation and its conservation agreement partners will monitor pupfish presence in each of the pupfish drains for five to seven consecutive years to establish patterns of use and to augment baseline information. Prior to the development of a revised protocol, the existing protocol to survey pupfish will be used. If possible, the revised protocol and the existing protocol will be conducted concurrently to calibrate the two methods with each other.

The need for continued monitoring of water quality, sediment, dietary components and pupfish presence will be re-assessed during the review at the end of the study and baseline survey program. If it is determined that continued monitoring is necessary, Reclamation and its conservation agreement partners will work with the Service and CDFG to develop an appropriate long-term monitoring program.

Yuma Clapper Rail and California Black Rail

In the action area, Yuma Clapper Rail predominantly occurs on State and Federal refuges. Agricultural drains support limited use by clapper rails. Breeding is not verified in the drains, but rail presence is documented in surveys of drains during the breeding season. The California black rail is known to occur in seepage areas along the All American Canal, but its use of the drains has

not been documented. Its habitat affinities are similar to the Yuma clapper rail. The IID drainage system is estimated to contain about 63 acres of cattails. Common reed, tamarisk, and arrowweed are the predominant species of the remaining 589 acres of vegetation in the drainage system. Potential project impacts on rails consist of loss and degradation of cattail vegetation in drains through increased salinity and exposure to increased selenium concentrations in drains.

The acreage of cattails supported in the drains could potentially be reduced by 4 acres due to increased salinity, and an additional 23 acres of remaining cattail vegetation could be subjected to increased salinity levels that could stunt growth and reduce vigor of the plant. If fallowing is used to conserve water, there would be no change in salinity in drains and, therefore, no impacts to cattail vegetation. Under current conditions, average impairment in rail egg hatchability due to selenium levels is 3 percent. As a result of IID's water conservation activities, hatchability could be impaired up to 6 percent, comprising a 3 percent increase above the current condition. Use of fallowing as a water conservation method would reduce the level of impairment due to increased selenium concentrations in the drains.

Rail Conservation Measure 1: Salinity Impacts

Thirty-one acres of high quality managed marsh will be created to offset potential salinity impacts (2:1 mitigation for 4 acres lost, and 1:1 mitigation for the additional 23 acres of reduced quality habitat). In cooperation with its conservation-agreement partners, Reclamation will work with the Service and CDFG to determine the design and location of these marshes. Design considerations will include the needs of both rail species. Based on concerns about the availability of suitable quality water in the Imperial Valley, it is anticipated that the location of these marshes will be elsewhere in the action area.

Rail Conservation Measure 2: Selenium Impacts

Forty-two acres of additional high quality managed marsh habitat will be created to offset the potential selenium impacts on rail egg hatchability. If feasible, this marsh habitat will be located adjacent to the managed marsh habitat discussed in Rail Conservation Measure 1. The created habitat will be monitored for selenium and salinity if located in the vicinity of the Salton Sea. The total amount of 73 acres of habitat will be created within 10 years of completion of this consultation. Design considerations will include the needs of both rail species. The selenium concentration of the water used to support the managed marsh habitat would be water of the same selenium concentration as lower Colorado River water or that meets an EPA criterion for protection of aquatic life that has received a "No Jeopardy" determination from the Service, whichever is greatest.

Rail Conservation Measure 3: Management and Monitoring

A long-term adaptive management and monitoring plan will be developed for the mitigation marsh and submitted to the Service and CDFG for review and approval prior to initiation of habitat creation activities. The management plan will consider the requirements of both the Yuma clapper rail and the California black rail. An acceptable monitoring plan for the mitigation marshes, which

specifies performance criteria for vegetation growth and the frequency and techniques used in monitoring including rail surveys, will be developed. The created marsh habitat will be maintained and managed for at least the duration of the QSA transfers. Water conservation activities that continue to cause take of listed species beyond the term of the QSA water transfers would require continued mitigation.

Following creation of the managed marsh habitat, the created habitat will be surveyed for Yuma clapper rails by Reclamation and its conservation agreement partners. The surveys will be conducted annually for 5 years following creation of the managed marsh. After the initial five-year survey period, the rail surveys will continue at the same frequency that clapper rail surveys are conducted on the federal wildlife refuge but no less frequently than once every five years. Currently, the federal wildlife refuge is surveyed annually for clapper rails. Surveys for Yuma clapper rails will follow the prevailing protocol as outlined in Attachment C. Reclamation and its conservation agreement partners will work with the Service and CDFG to further refine the survey protocol as needed for the created habitat.

Reclamation, its conservation agreement partners, the Service, and CDFG will annually review results of rail surveys and assess the effectiveness of the managed marsh in providing habitat for clapper rails. In evaluating the effectiveness of the marsh in providing habitat for clapper rails, Reclamation, its conservation agreement partners, the Service, and CDFG will consider the use of the State and Federal refuges by clapper rails as compared to the managed marsh. By considering and comparing use (occurrence, abundance, and life history functions) of the managed marsh and at State and Federal refuges (if available), it will be possible to assess whether the managed marsh is providing for the species, while at the same time taking into account stochastic factors not attributable to management. Management will be adjusted as necessary based on the results of the annual surveys.

The managed marsh will be considered successful if Yuma clapper rails and California black rails have been found to use the marsh during the breeding season at any time during the 5 years following the creation of the marsh. If it is determined that either one or both of the species did not use the managed marsh during the 5 years, then Reclamation and its conservation agreement partners will meet with the Service and CDFG to identify possible changes needed in the management of the marsh habitat.

Examples of actions that could be taken in adjusting management include, but are not limited to:

- Changes in flooding regime
- Vegetation management activities (e.g., replacement of failed plantings, burning, discing, flooding)
- Minor earth-moving activities within the managed marsh units
- Changes in water levels
- Predator control
- Invasive species control

Southwestern Willow Flycatcher

Although Southwestern Willow Flycatchers have been observed in low numbers during migration season, no breeding has been documented within the action area. Willow flycatchers have been reported using tamarisk and common reed along the Salton Sea and agricultural drains, and in seepage communities adjacent to the East Highline Canal during migration. In other areas within its range, Southwestern Willow Flycatcher has been documented using tamarisk stands for breeding, if these stands contain areas of saturated soils or standing water. Water conservation activities undertaken by IID have the potential to impact tamarisk stands within the action area. However, it is unknown if any of these stands have the necessary components to be considered suitable Southwestern Willow Flycatcher breeding habitat at this time.

Willow Flycatcher Conservation Measure 1: Evaluate Habitat

All potential cottonwood-willow and tamarisk stands will be evaluated for Southwestern Willow Flycatcher breeding habitat suitability. Using the Anderson and Ohmart classification system (1994), each Saltcedar III and IV and each Cottonwood-willow I, II, III, and IV stand will be evaluated for suitability based on density, structure, and presence of standing water or saturated soils during the breeding season. Suitable breeding habitat will be identified based on characterizations provided in the draft Southwestern Willow Flycatcher Recovery Plan.

These evaluations will take place prior to any IID water conservation activities which could impact tamarisk habitat. Upon completion of this initial evaluation, a specific protocol for the habitat monitoring (identified below as Conservation Measure 2) will be developed in consultation with the Service and CDFG. This protocol will address the timing and duration of monitoring activities and other details as required.

Willow Flycatcher Conservation Measure 2: Suitable Habitat Monitoring

If suitable Southwestern Willow Flycatcher breeding habitat is identified during Conservation Measure 1, this habitat will be monitored to quantify changes in the amount and quality of habitat. If suitable breeding habitat is lost or the quality of the habitat declines as a result of IID's water conservation activities so that it is no longer considered suitable breeding habitat, this loss will be offset through the creation and/or acquisition and preservation of higher quality, native riparian replacement habitat at a 1:1 ratio. Reclamation and its conservation agreement partners will work with the Service and CDFG to develop the specific survey protocol necessary to monitor and quantify changes in the amount and quality of breeding habitat in the future. A general approach is provided in Attachment A.

Willow Flycatcher Conservation Measure 3: Management and Monitoring of Habitat

A long-term adaptive management and monitoring plan will be developed for any replacement habitat whether created or acquired. This plan will include monitoring of all of the same characteristics of the habitat used in Measure 1 to determine suitability for breeding by southwestern willow flycatchers. The success criteria will be based on these suitability

characteristics such that the created or acquired habitat can be documented to include the suite of characteristics that makes it suitable for southwestern willow flycatcher breeding. This plan will be developed in consultation with the Service and CDFG. Specific locations for the replacement habitat would be identified in consultation with the Service and CDFG and would be located in the Salton Trough or the lower Colorado River corridor.

Willow Flycatcher Conservation Measure 4 - Take Minimization During Construction

IID could install seepage recovery systems along the East Highline Canal or lateral interceptors to capture operation discharges in the delivery system to conserve water. If suitable breeding habitat for southwestern willow flycatchers is identified in the seepage communities adjacent to the East Highline Canal or in locations to be impacted by lateral interceptor construction, removal of suitable habitat in association with these construction activities will be scheduled to occur outside the breeding season for the southwestern willow flycatcher. Specifically, removal of habitat would not occur between April 15 and August 15.

California Brown Pelican

Most California Brown Pelican use of the Salton Sea is by post-breeding visitors, with more limited use for wintering. These visitors are mostly young birds that disperse northward from breeding areas in the Gulf of California (Hazard, pers. comm. with CH2MHill). The primary mechanism through which IID's water conservation activities could result in take of California brown pelicans at the Salton Sea is a reduction in fish abundance.

Brown Pelican Conservation Measure 1 – Roost Site Creation

Reclamation, in cooperation with its conservation-agreement partners, will construct at least two roost sites for brown pelicans along the Southern California Coast. The objective of this conservation measure is to provide at least 2 major roost sites that in combination support roosting by at least 1,200 pelicans. The roosts will be sized to accommodate up to 1,000 pelicans each. A major roost site is defined as supporting at least 100 pelicans during June through October based on maximum counts. The roost sites are to be installed and functioning by 2018 and demonstrated to support at least 100 pelicans each and to support at least 1,200 pelicans in combination. They will be maintained through 2048.

The two required roosts will be located in South San Diego Bay and in the outer harbor of Santa Barbara unless future investigations determine installation of roost sites at these locations to be infeasible. A barge or similar structure will be anchored to create a roost site in the outer harbor in Santa Barbara. Large numbers of brown pelicans previously roosted on a barge in the outer harbor until the owner of the barge removed it (American Trader Trustee Council 2001). Thus, this measure would focus on restoring this roost site. The second roost site will be created in South San Diego Bay by installing one or more structures suitable for roosting pelicans and appropriate to the site-specific conditions in the bay. Few roost sites are present in the South San Diego Bay area which could limit use of this area by pelicans. Establishing a roost in this area could support

increased use by brown pelicans and also benefit juveniles dispersing from Mexico as they move along the coast.

The roost sites will be monitored annually for use by brown pelicans beginning one year after their installation (i.e., 2018). Monitoring will consist of monthly day and night roost surveys during June through October. Monitoring will be used to determine 1) if the created structures are serving as a major roost (i.e., more than 100 pelicans) and 2) if they are major roosts, are they, in combination, supporting at least 1,200 pelicans. Based on the five years of monitoring, a roost site will be considered a major roost if the maximum number observed was at least 100 pelicans during 3 out of 5 years. Similarly, if the two roost sites in combination support at least 1,200 pelicans during any of the 5 years based on maximum counts, the conservation measure will be considered successful. Because monitoring of the roosts will be initiated one year after they are installed, data will be available on an annual basis to allow an early assessment of whether the objective of supporting 1,200 pelicans is likely to be achieved with the initial two roosts or if additional roosts will need to be installed.

If a roost site does not support at least 100 pelicans, Reclamation and its conservation agreement partners will work with the Service and CDFG to modify the roost site to achieve the target. If modifications to the roost site are not likely to achieve the objective, Reclamation and its conservation agreement partners will work with the Service and CDFG to identify one or more locations to establish additional roosts sites as necessary to establish two major roosts. Similarly, if the two roosts in combination do not support at least 1,200 pelicans, Reclamation and its conservation agreement partners will work with the Service and CDFG to modify the roost sites or establish additional roost sites until at least two major roosts are established and all created major roosts combined support at least 1,200 pelicans by 2023. The Service and CDFG will consider the ongoing use of the Salton Sea by brown pelicans to determine if an extension of this date is appropriate. Attachment B summarizes information on locations along the Southern and Central California Coast where roost sites could be created or improved in the event that the initial two roosts do not achieve the objectives.

The roost sites will continue to be monitored annually after the initial five year effectiveness monitoring period. Reclamation and its conservation agreement partners will work with the Service and CDFG to develop an appropriate level of intensity for the monitoring. During the course of the proposed fish and wildlife conservation measures, the frequency for the monitoring may be reduced with approval from the Service and CDFG. If the monitoring data show a decline in use of a roost site by brown pelicans to a level below the target population (i.e., 1,200 pelicans) and the decline in use can be reasonably attributed to the characteristics or management of the roost site, then Reclamation and its conservation agreement partners will work with the Service and CDFG to identify and implement actions to re-establish conditions to support 1,200 pelicans.

Interrelated Actions

The IID, CVWD, and MWD negotiated the terms of the QSA. Although not a signatory to the proposed QSA, SDCWA is a member agency of MWD. SDCWA participated in the QSA negotiations and benefits or is impacted by certain of its terms. The QSA is a consensual transfer

of Colorado River entitlement based on a series of proposed agreements, which include water conservation/transfer and exchange projects among IID, CVWD, and MWD. The proposed QSA provides part of the mechanism for California to reduce its water diversions from the Colorado River in normal years to its apportioned amount of 4.4 MAF under the California Plan. The implementation of the proposed QSA, which includes water conservation and water transfers from agricultural use to principally urban use, would result in a net reduction of Colorado River diversions to California.

If the QSA is fully approved by the participating agencies and the conditions precedent to implementation of the QSA are satisfied or waived, SDCWA would be limited to the primary amount (130 to 200 thousand acre-feet/year (KAFY)) of transferred water under the IID/SDCWA Transfer Agreement. CVWD would have an option to acquire up to 100 KAFY, and MWD would have an option to acquire any portion of the 100 KAFY that CVWD elects not to acquire. The federal approvals required to implement water deliveries in accord with the QSA will be evidenced by the Secretary's execution of the Implementation Agreement.

The QSA also includes the allocation of conserved water to be generated by other projects that have been assessed in other final CEQA/NEPA documentation and/or section 7 consultations. The 1988 IID/MWD Agreement and subsequent agreements and modifications were the subject of a CEQA analysis that determined that the impacts of that project were not significant. There was no Federal action needed to carry out the requirements of these agreements, and all water conservation activities required as part of these agreements have been implemented. The construction projects required to line the All American and Coachella Canals have already undergone consultation. The MWD and the San Luis Rey Indian Tribes (as a result of a settlement agreement) will receive conserved water from these two projects. The consultation process for these two projects did not address receipt and use of the water by these entities on the coast, nor is it included here. The CVWD/MWD State Water Project Transfer/Colorado River Exchange is considered outside of this proposed action and is not addressed in this consultation. Other water caps and shortage sharing agreements included in the QSA also are not addressed in this analysis. This consultation is limited to the fish and wildlife conservation measures described above and the water conservation activities required of IID to implement the requirements of the IID/SDCWA Water Conservation and Transfer Agreement and the QSA (including capping their water use at 3.1 MAF/year). Receipt and use of the water by SDCWA, CVWD, and MWD is not addressed. SDCWA and MWD have stated that their use of the water will not result in additional impacts as it constitutes replacement for surplus water needed to meet existing needs (CH2MHill 2002, MWD 2000). CVWD has begun discussions with the Service and CDFG regarding addressing the impacts of their use of the water through participation in the Coachella Valley Multi-Species Habitat Conservation Plan or an independent HCP for the receiving area.

Potential IID Water Conservation Activities Resulting from Proposed QSA Water Transfers

Water conservation or other water use activities will be implemented by IID to conserve the water to be delivered pursuant to the QSA and the California Plan for the Colorado River. Implementation of water conservation activities would occur gradually, based on schedules defined in the QSA. Water conservation would likely be accomplished through a combination of on-farm

and system-based conservation methods. On-farm methods consist of actions taken by individual farmers or landowners to conserve water under voluntary water conservation agreements with IID. System-based conservation methods consist of actions that may be undertaken by IID to conserve water. The exact mix of conservation methods employed may vary over the life of the water transfer term and will be determined by IID. Because these activities are anticipated to have adverse effects to listed species that would otherwise be prohibited by the ESA, these activities could not be implemented but for the proposed fish and wildlife conservation measures described above and the resulting incidental take exemption provided herein. The following sections describe the suite of conservation methods that could be implemented by IID to develop water for transfer.

15-Year Minimization Plan

This plan requires that the transfer not materially affect the salinity of the Salton Sea during the first 15 years of the transfer. This has been required by the State of California and will result in impacts to Salton Sea species being minimized during that time. IID will deliver a total of 1.0 million acre-feet (MAF) to SDCWA over these first 15 years of the transfer. The volume will be ramped up at 10,000 acre-foot intervals, and IID will transfer a volume of 100,000 acre-feet in years 11 through 15 of the transfer. This volume will be achieved through fallowing and will require that 25,000 to 30,000 acres be fallowed during this period in order to deliver water to the SDCWA and the Salton Sea.

The transfer of water from IID to CVWD will commence in 2008. This water will be conserved through efficiency conservation, and the volume of water will be ramped up at a rate of 4,000 to 5,000 acre-feet/year (AFY). The total volume to be made available to CVWD during the first 15 years of the transfer is 240,000 acre-feet (AF). This conservation and transfer results in a reduction of inflows to the Salton Sea of 160,000 AF during the first 15 years. Given the difference in salinity between the baseline and this project is approximately 1 ppt in year 15, this was not considered a material effect to the Salton Sea.

MWD has offered to provide water generated by their transfer agreement with Palo Verde Irrigation District (PVID) in order to meet the requirement that the water conservation and transfer program not materially affect the Salton Sea salinity for 15 years. MWD will make up to 390,000 AF available to SDCWA over the first 15 years of the transfer on a schedule to be determined by MWD. This project was evaluated under a separate California Environmental Quality Act (CEQA) process, and PVID has determined that no take of listed species will occur in the Palo Verde Valley as a result of that project. Therefore, this project is not included as part of this consultation, and no take is authorized.

As part of the requirement to keep the Salton Sea from materially deviating from the baseline salinity, the water agencies are considering substituting drain water inflows with groundwater from the East Mesa area. The agreement allows for this to be pursued provided that it is accomplished at no cost to IID. In this case, IID would be able to increase its deliveries to SDCWA and reduce the fallowing requirement. The use of groundwater from East Mesa has not been evaluated and will require additional environmental compliance prior to its implementation. This action is not included in the current consultation process.

On-Farm Water Use and Conservation

The conservation of up to 300 KAFY of water in the IID service area will require changes in current farming practices and may result in substantial capital investments in water conservation equipment and technologies. Farmers may voluntarily enter into agreements with IID, thereby committing to the implementation of water conservation activities. These activities would require farmers to make capital investments in various types of water conservation equipment and facilities. In many cases, farmers will be required to obtain financing for construction costs to implement and maintain conservation equipment. The farmers' ability to obtain financing will depend on the estimate of the direct and indirect costs of implementing water conservation activities.

Many farmers own land in the IID service area. Some lease their land from third parties, and others lease their land from IID. This biological/conference opinion includes potential impacts from water conservation activities on land in the IID service area, regardless of who owns the land and who conducts the activities. The options for conserving water that are available to farmers generally fall into these categories:

1. Installation of structural or facility improvements, or conversion to irrigation systems that increase efficiency and reduce water losses

2. Irrigation management

3. Land use practices

Installation of Structures/Facilities and Conversion of Irrigation Systems

On-farm water conservation can be achieved through various techniques using existing technology. On-farm water conservation activities may include:

- Tailwater return systems
- Cascading tailwater systems
- Level basins
- Shorten furrows and border strip improvements
- Narrow border strips
- Cutbacks
- Laser leveling
- Multi-slope
- Drip irrigation

The techniques for achieving water conservation would be at the discretion of the individual farmer. It is expected that some combination of the techniques listed would be employed.

Irrigation Management

Certain farmers may be able to conserve water and cultivate the same acreage through better irrigation management without constructing facilities or changing irrigation methods. Irrigation management refers to controlling the timing and amount of each irrigation application to provide adequate crop water for maximum yield and to achieve adequate soil leaching. On-farm irrigation management will continue to evolve as the science of crop/soil water develops and as farmers understand irrigation management better and increase their practical use of it. As greater demands are put on agricultural areas to conserve more water in California, irrigation water management will become a more important tool for farmers.

Land Use Practices

Fallowing can be described as the reduction or cessation of certain farmland operations for a specified or indefinite period of time. For this analysis, fallowing is defined as:

- Long-term land retirement (greater than 1 year), whereby crop production ceases indefinitely or during the term of the water conservation and transfer agreements. A cover crop may be maintained during the period of inactivity, or the land may be returned to natural vegetation.
- Rotational fallowing, whereby crop production ceases for 1 calendar year. No water is applied, and no cover crop is grown.
- Single crop fallowing, whereby multiple crops are reduced to a single crop rotation on an annual or longer term basis.

IID's Board of Directors adopted Resolution No. 5-96, stating that IID will not support fallowing programs for purposes of transferring water. However, there is no prohibition of fallowing under the terms of the QSA. Fallowing may be considered a potentially viable method to achieve water conservation in IID's service area. IID will not pay farmers to change crops in order to reduce water use (John Eckhardt, formerly of IID, pers. comm.). It is their position that market forces, not water use, will continue to drive crop choice in the Imperial Valley.

System-Based Water Conservation Activities

As part of IID's water conservation and transfer programs, IID may choose to implement operational and structural improvements to conserve water by preventing unnecessary losses from the delivery system. The specific improvements that would be undertaken are uncertain; however, the types of improvements that IID could pursue include the following:

- Installing additional lining in canals and laterals
- Replacing existing canal linings as normal maintenance to prevent leakage
- Automating flow control structures
- Installing check gates in the laterals that are automated or manually operated
- Installing non-leak gates
- Installing additional lateral interceptors

- Installing additional pipelines
- Installing additional reservoirs, including small, mid-lateral reservoirs to provide temporary water storage and increase delivery efficiency
- Developing water reclamation systems
- Installing pump or gravity-operated seepage recovery systems

Canal Lining and Piping

Canal lining consists of lining canals with concrete or using pipelines to reduce seepage. About 537 miles of canals are currently unlined. To line a canal, the existing canal is filled in and then trenched to form a trapezoidal channel. Concrete is then installed on the banks and bottom of the channel using a lining float. Construction activities can be conducted in the canal's right-of-way and impact an area about 70 feet wide centered on the canal. The canal rights-of-way consist of either roads, embankments, or other disturbed ground. About 1 week is required to line a mile of canal. A component of the conservation activities proposed under the IID /SDCWA Transfer Agreement included lining in three canal sections in the IID service area totaling about 1.74 miles.

Lateral Interceptors

A lateral interceptor system consists of new canals and reservoirs that collect operational spills from lateral canals. Lateral interceptors are lined canals or pipelines that generally run perpendicular to lateral canals at their terminus. The lateral interceptors capture operational spill water, unused water resulting from canal fluctuations, and return water from farmer delivery reductions or changes. The interceptors convey this captured water to regulating reservoirs, where the water can be stored and reused in another canal serving another delivery system as needed. IID has four systems in operation and potentially could enlarge or expand system capacity in response to the need to conserve water for transfer.

Installation of a lateral interceptor requires constructing and lining a canal, installing pipelines, and constructing a minimum 40-acre surface reservoir. An approximately 70-foot-wide area centered on the new interceptor would be impacted by the construction. The impacted area of the reservoir site would be only slightly larger than the reservoir itself. A component of the conservation activities proposed under the IID /SDCWA Transfer Agreement included installation of up to 16 lateral interceptors. The total acreage potentially impacted by construction of lateral interceptors could be about 1,480 acres (i.e., approximately 840 acres of canals and 640 acres of reservoir).

Reservoirs

Two types of reservoirs can facilitate water conservation: operational reservoirs (includes mid-lateral reservoirs) and interceptor reservoirs. Operational reservoirs are generally placed in locations to take advantage of delivery system supply and demand needs and, in some cases, include locations of historical canal spills. These reservoirs are used to regulate canal flows to match or optimize demand flows to supply flows. Conservation is achieved by reducing operational spills as a result of this mismatch of flows by storing excess supply water and then releasing this water in order to meet demand needs.

Interceptor reservoirs enhance lateral interceptor system operations. They are typically placed at the end of the lateral interceptor canals to store intercepted flows (operational discharges) for re-regulation rather than losing these flows to the drainage system. These stored flows are later released for use in other delivery system canals to meet water demand. These reservoirs would contain automated inlet and outlet structures that would enable the maintenance of the desired water flow. IID currently does not have any reservoirs in design, but could choose to construct these facilities in response to a 300 KAFY reduction in water delivery. Reservoirs would likely be 1 to 10 acres in size, with a capacity ranging from about 5 to 30 AF. It is assumed that construction of these reservoirs could encompass up to 1,000 acres total.

In addition to reservoirs constructed and operated by IID, farmers in the Imperial Valley may construct small regulating reservoirs to facilitate the conservation of water. These 1- to 2-acre reservoirs would be constructed at the upper end of agricultural fields and used to better regulate irrigation water applied to fields and to settle suspended solids prior to introduction into drip irrigation systems. These reservoirs would contain water only during irrigation operations, remaining dry during the remainder of the year. IID anticipates that these reservoirs could be used on up to 50 percent of the agricultural land in its service area. A single reservoir services about 80 acres of land. Up to about 5,900 acres of agricultural land could be converted to regulating reservoirs valley-wide.

Seepage Recovery Systems

To conserve water, IID could install seepage recovery systems adjacent to the East Highline Canal. Surface and subsurface recovery systems conserve water by collecting canal leakage in sumps along a canal and pumping the water back into the same canal.

In a surface drain recovery system, seepage is captured and conveyed through open channels to a concrete sump. From there, it is pumped back into the canal. Construction required to install a surface recovery system is minimal. For a surface recovery system, a small check structure would be constructed in the existing parallel drain to pond water to a depth of about 3 feet. A pump station would return water to the East Highline Canal. These systems are appropriate in locations where there is an existing drain that collects seepage and directs water to the drainage system.

In a subsurface recovery system, canal seepage flows are collected in a perforated pipe that directs the water to a concrete sump. From there, it is pumped back into a canal. Subsurface systems are proposed in areas lacking an existing parallel open drain. To install these systems, a trench is excavated, and a pipe is laid in place. The pipeline outlets to a collection well consisting of an 8-foot-diameter vertical pipe from which the water is pumped back to the delivery canal. Construction disturbs an area about 70 feet wide along the pipeline. Following completion of the system, a right-of-way of about 70 feet along the pipeline would need to be kept free of deep-rooted vegetation.

Operations and Maintenance Activities Conducted By IID

These actions are outside Reclamation's proposed action and are not interrelated to the fish and wildlife conservation measures. Operations and maintenance activities in and along the drains, canals, and other facilities operated by IID are ongoing and would be necessary with or without the water conservation and transfer program, with the exception of the maintenance of the canal linings, lateral interceptors, mid-lateral reservoirs, and seepage recovery systems installed as part of the program. Because these new facilities are expected to be located in areas not used by listed species or maintained in a condition that does not provide habitat for listed species, impacts to listed species from these operation and maintenance activities are not expected. The conditions that result from maintenance activities associated with existing facilities are considered to be part of the baseline and are not addressed in this consultation process.

Action Area

This biological opinion includes lands comprising the approximately 500,000 acres of IID's water service area in Imperial County, California, the Salton Sea (including lands owned by IID outside of its water service area that are currently submerged by the Salton Sea), and areas of the Coachella Valley that are adjacent to the Salton Sea. This area is illustrated on Figures 1-1 (IID) and 1-2 (Salton Sea). The Action Area also includes the lower Colorado River valley and the coastal California range of wintering California brown pelicans. Measures included in the willow flycatcher and the rail conservation packages may include habitat replacement along the lower Colorado River. Brown pelican conservation measures include enhancements of habitat on the coast to offset losses occurring at the Salton Sea.

STATUS OF THE SPECIES

Desert Pupfish

The desert pupfish is the largest of the North American pupfish. Although they may reach 3 inches (7.6 centimeters) in length, they are seldom more than half that size. They have a smoothly rounded body shape and narrow, vertical dark bars on the sides (Schoenherr 1992). Breeding males are blue on the tops and sides, and have yellow to orange fins. Females and juveniles have tan to olive colored backs and silvery sides. Pupfish typically occupy the shallow waters of springs, small streams and marshes. Desert pupfish are adapted to harsh desert environments and capable of surviving extreme environmental conditions (Moyle 1976; Lowe *et al.* 1967). Although desert pupfish are extremely hardy in many respects, they prefer quiet water with aquatic vegetation (Schoenherr 1992), and they cannot tolerate competition or predation and are thus displaced by exotic fishes (USFWS 1986).

Tolerance for environmental extremes is a notable feature of the desert pupfish. This is important because desert habitats experience wide variations in temperature, salinity, and dissolved oxygen. The critical thermal maximum of 44°C for this species is the highest ever recorded for a species of fish. This ability to tolerate hot water also enables them to live in hot springs. In such a habitat, the desert pupfish may feed on blue-green algae that live in water hotter than its critical thermal

maximum. Also recorded for the desert pupfish is the lowest tolerated minimum for dissolved oxygen, at 0.13 mg/l. The species' range of tolerance for salinity is also high. Adult desert pupfish tolerate water from distilled to 70 g/l (twice the concentration of seawater) (Schoenherr 1992). Barlow (1958) reported that adult desert pupfish survived salinity as high as 98,100 mg/L in the laboratory.

Desert pupfish are opportunistic feeders. Their diet, which varies seasonally with food availability, consists of algae, minute organisms associated with detritus, insects, fish eggs, and small crustaceans (Cox 1972; Naiman 1979). In the Salton Sea, ostracods, copepods, and occasionally insects and pile worms are taken (Moyle 1976). Adults are not considered food for piscivorous birds or fish because of their sparse density (Walker *et al.* 1961; Barlow 1961).

The historic range once extended from the Gila River tributaries in southern Arizona and northern Sonora, westward to the Salton Sea area and southward into the Colorado River delta region in Sonora and Baja California, Mexico (Minckley 1980; Miller 1948; Miller and Fiuman 1987). It also formerly occurred in the slow-moving reaches of some large rivers, including the Colorado, Gila, San Pedro, Salt, and Santa Cruz Rivers. Where suitable habitat was available, desert pupfish probably occurred in the Agua Fria, Hassayampa, and Verde Rivers of Arizona as well. Distribution of desert pupfish was widespread, but probably not continuous within its historic range (CH2MHill 2002).

Currently, this species is known from only a few locations in California and Mexico. The only remaining natural populations are found in a few sites in the Salton Sea drainage, and the Colorado River Delta in Baja California and Sonora, Mexico. Specifically, it is found in San Felipe Creek and its associated wetlands in Imperial County and Salt Creek in Riverside County, both Salton Sea tributaries (Nicol *et al.* 1991), more than fifty localities in drains and shoreline pools on the southern and eastern margins of the Salton Sea (Lau and Boehm 1991), and in small pools in the upper Coachella Valley. Sutton (1999) observed desert pupfish movement between the Salton Sea and nearby drains. Pupfish were observed moving from both irrigation drains and Salt Creek downstream into shoreline pools. The reverse movement from shoreline pools upstream into both drains and Salt Creek was also observed. Decreases in the size of shoreline pools during seasonal fluctuations in water levels may affect fish health and/or force pupfish to seek other habitat. Thus, the connectivity between habitat types may be necessary to prevent pupfish from becoming stranded in habitats that cannot sustain them for prolonged periods (Sutton 1999). These observations indicate the importance of agricultural drains as pupfish habitat and the potential for pupfish to use shoreline aquatic habitats as corridors. This potential movement may be important in providing genetic mixing between various populations.

Specifically, desert pupfish prefer backwater areas, springs, streams, and pools along the shoreline of the Salton Sea. Desert pupfish habitat occurs in pools formed by barnacle bars located in shoreline areas of the Salton Sea and in Salt Creek. Barnacle bars are deposits of barnacle shells on beaches, shoreline areas, and at the mouths of drains that discharge to the Salton Sea. The bars form pools that provide habitat for desert pupfish (IID 1994). Habitat for desert pupfish also occurs in the mouths of drains discharging directly to the Salton Sea, in San Felipe Creek, and in Salt Creek.

Spawning at the Salton Sea takes place between late March and late September when water temperatures exceed 20° C (Moyle 1976; UCLA 1983). Pupfish can spawn several times during this period. Adult male desert pupfish are very territorial during the spawning season such that schools consist either entirely of adult females or entirely of juveniles. Desert pupfish usually set up territories in water less than 1 m (3 feet) deep and associated with structure (Barlow 1961). Territoriality is highest in locations with large amounts of habitat, high productivity, high population densities, and limited spawning substrate (USFWS 1993). Desert pupfish prefer water 18 to 22 centimeters (cm) deep for egg deposition (Courtois and Hino 1979). Depending on size, a female pupfish may lay 50 to 800 eggs or more during a season (Crear and Haydock 1971). The eggs hatch in 10 days at 20° C, and the larvae start feeding on small invertebrates within a day after hatching (Crear and Haydock 1971). Larvae are frequently found in shallow water where environmental conditions are severe.

Although remarkably tolerant of extreme environmental conditions, the desert pupfish is threatened throughout its native range primarily because of habitat loss or modification, pollution, and introductions of exotic fishes (USFWS 1986). Improper grazing can increase turbidity by increasing erosion and reducing riparian vegetation. Water pollution from the application of pesticides in proximity to desert pupfish habitat is also an important factor, contributing to the decline of the Quitobaquito subspecies (Miller and Fuiman 1987). Droughts can cause the springs and headwaters that this species inhabits to dry up. Water development projects can degrade desert pupfish habitat by removing water through groundwater pumping, diversion, and irrigation. The reduction of the amount of water in these habitats can create situations where the desert pupfish are at a competitive disadvantage with exotic fish species.

Currently, there are two recognized subspecies of the desert pupfish, *Cyprinodon macularius macularius* and *C.m. eremus*. Both subspecies were included in the federal listing of the desert pupfish as endangered on March 31, 1986 (51 FR 10842, USFWS 1986). The population is defined as occurring in Quitobaquito Springs, Arizona; Salton Sink, California; El Doctor, Laguna Salada, and Cerro Prieto in Baja California, Mexico; and Rio Sonoyta in Sonora, Mexico (58 FR 6526, USFWS 1993). Only the *C.m. macularius* subspecies occurs in the proposed project area. In California the San Felipe Creek system, including San Sebastian Marsh, and Salt Creek provide natural habitat for desert pupfish populations.

Recently, Echelle *et al.* (2000) used mitochondrial DNA variation to describe the genetic structure of C. *macularis*, which represents two evolutionarily divergent entities that should be recognized as two monophyletic groups: Rio Sonoyta/Quitobaquito and Salton Sea/Colorado River Delta. Although the same haplotype was common throughout both the Salton Sea and Colorado River Delta regions, the distribution of less common haplotypes indicates a lack of wholesale intermixing. A conservative management approach would avoid intermixing pupfish between these two regions beyond what occurs naturally. Although the Salton Sea and Colorado River Delta revealed no significant differences among paired samples within and between the two regions, they also shared no haplotypes with samples from the Rio Sonoyta/Quitobaquito regions. This suggests long, mutually exclusive evolutionary histories (Neigel and Avise 1986) for the two monophyletic groups, a hypothesis that is consistent with geological history. Although there were relative uncommon haplotypes found in the Salton Sea and Colorado River Delta region, there were no

unique haplotypes to just the Salton Sea region. This is probably attributable to recent gene flow occurring between the Salton Sea and Colorado River Delta region due to population expansion and dispersal with alternating population declines, isolation, and extinctions (Dunham and Minckley 1998). The low level of diversity exhibited by the two regions could also be attributable to a bottleneck effect or founder event. More recent separation of the Rio Sonoyta and Quitobaquito Springs populations would explain the lack of significant difference in haplotype frequencies between samples from these two areas. However, Echelle *et al.* (2000) recommends conservative management with no artificial intermixing of the populations for the Rio Sonoyta and Quitobaquito regions.

Critical habitat has been designated for this species at San Felipe Creek and two of its tributaries, Carrizo Wash and Fish Creek Wash [50 CFR 17.95 (e), USFWS 1986]. A total of approximately 770 acres of critical habitat has been designated. A draft recovery plan issued on January 29, 1993 (58 FR 6526, USFWS 1993) includes 3 goals to aid in the recovery of the desert pupfish: 1) secure, maintain (including habitat and water rights), and replicate all extant natural populations ; 2) acquire additional natural habitats; and 3) to establish replicates in the most natural habitats within the probable historic range. Further objectives include determination of habitat and biological criteria, acquisition of life history information, development and implementation of genetic protocol, population monitoring, and information and education. In the Salton Trough, this species would benefit from a reduction in the populations of exotic fish species that compete with or prey upon the desert pupfish. Efforts are ongoing by CDFG to maintain pupfish habitats in San Felipe and Salt Creeks free of exotic fish species. Control of exotic fish in the drains is not likely possible, but conditions that favor pupfish over the exotic species (shallow depths in particular) could be targeted to reduce the impacts of exotic fish species on desert pupfish in the drains. CDFG and the Bureau of Land Management have been implementing measures that reduce tamarisk stands around San Felipe and Salt Creeks to maintain adequate flows for desert pupfish in these areas. This is an ongoing need.

Yuma Clapper Rail

The Yuma clapper rail is the size of a crow, with long, gray-brown legs and toes. The orange bill is long, thin, and slightly down-curved. The head, neck, and breast are gray-brown, and the back feathers are darker brown with gray centers. Both the flanks and the undertail covert feathers are distinctly marked with alternate black and white bars. Males and females are similar in plumage coloration. Compared with the other dozen or so described subspecies, its plumage is less richly colored (paler, with more olive and gray tones) and its bill more slender (Dickey 1923). The body is laterally compressed, the tail and wings are noticeably short, and legs are large and strong, all adaptations that allow birds to run through dense weeds or swim underwater to avoid danger.

Yuma clapper rail habitat is characterized by cattail (*Typha*), bulrush (*Scirpus*), or tule stands, and shallow, slow-moving water near high ground. Cattail and bulrush stands are often dissected by narrow channels of flowing water that may be covered by downed vegetation. These open channels are important for foraging. Rails commonly use areas with low stem densities and little residual vegetation. They are also found in the ecotone between emergent vegetation and higher ground, such as the shoreline, channel edge, or hummocks in a marsh. In studies conducted along

the lower Colorado River, rails were found to use areas far from a vegetative edge during early winter (Conway *et al.* 1993). The depth of water used by clapper rails also varied with season, with shallower water used during the breeding season, and water of moderate depth used during the winter. Although clapper rails are often found in larger stands of vegetation, they have also been found to use patches of habitat within agricultural drains (Bennett and Ohmart 1978).

Clapper rails prey upon a variety of small invertebrate and fish species that inhabit marshy areas. The Yuma clapper rail has a diverse diet. It has been documented to feed on a variety of invertebrates and some vegetation. Included in its diet are crayfish, fresh water prawns, weevils, isopods, clams, water beetles, leeches, damselfly nymphs, small fish, tadpoles, seeds, and twigs. Based on the available information, crayfish of the genera *Procambarus* and *Oropectus* appear to make up the majority of its food intake along the Colorado River (Ohmart and Tomlinson 1977). Similar crustaceans are taken at the Salton Sea, and the abundance of these animals may be a better predictor of rail population densities than vegetation (Anderson and Ohmart 1985; Patten *et al.*, in press). Reported rail densities vary widely. Bennett and Ohmart (1978) reported rail densities in the Imperial Valley of 0.9 to 6.3 rails/10 hectares (3.9 to 27.4 acres/rail). Todd (1986) reported range size in Mittry Lake averaged 2.5 acres/rail (5.0 acres/pair). In that same study Todd determined that the range size along the Gila River was 0.3 to 9.0 acres. Anderson and Ohmart (1985) reported a home range size of 18.5 acres/pair.

The Yuma clapper rail is one of seven clapper rail (*Rallus longirostris*) subspecies presently recognized in the western United States and the Pacific Coast of Mexico (American Ornithologists Union 1957), and it is one of three subspecies of federally endangered western clapper rail populations. It occurs primarily in the lower Colorado River Valley in California, Arizona, and Mexico and is a fairly common summer resident from Topock south to Yuma in the U.S. and at the Colorado River Delta in Mexico. There are also populations of this subspecies at the Salton Sea in California, and along the Gila and Salt Rivers to Picacho Reservoir and Blue Point in central Arizona (Rosenberg *et al.* 1991). In recent years, individual clapper rails have been heard at Laughlin Bay and Las Vegas Wash in southern Nevada (NDOW 1998). Population centers for this subspecies include Imperial Wildlife Management Area (Wister Unit), Sonny Bono Salton Sea NWR, Imperial NWR, Cibola NWR, Mittry Lake, West Pond, Bill Williams Delta, Topock Gorge, and Topock Marsh. The USFWS (1983) estimated a total of 1,700 to 2,000 individuals throughout the range of the subspecies. Between 1990 and 1999, call counts conducted throughout the subspecies range in the U.S. have recorded 600 to 1,000 individuals. In 1985, Anderson and Ohmart (1985) estimated a population size of 750 birds along the Colorado River north of the international boundary. A substantial population of Yuma clapper rails exists in the Colorado River Delta in Mexico. Eddleman (1989) estimated that 450 to 970 rails inhabited this area in 1987. Piest and Campoy (1998) reported a total of 240 birds responding to taped calls in the Cienega de Santa Clara region of the Delta. These counts are only estimates of the minimum number of birds present. The population is probably higher than these counts show, since up to 40 percent of the birds may not respond in call surveys (Piest and Campoy 1998). Based on the call count surveys, the population of Yuma clapper rails in the U.S. appears stable (USFWS unpublished data). The range of the Yuma clapper rail has been expanding over the past 25 years, and the population may be increasing (Ohmart and Smith 1973; Monson and Phillips 1981; Rosenberg *et al.* 1991; McKernan and Braden 1999). A recent genetic analysis showed that this

subspecies is outbred; population numbers of the Yuma clapper rail have not become low enough to reduce genetic diversity (Bureau of Land Management 2001).

The Yuma clapper rail breeds from March to July in marshes along the Colorado River from the Nevada/California border south to the Colorado River Delta region in Mexico. Chicks generally fledge by mid-September (Eddleman and Conway 1998). It builds its nest on a raised platform of vegetation concealed in dense marsh vegetation (Patten *et al.*, in press). Males may build multiple nests, and the female chooses one for egg-laying. Alternate nests are used as platforms for loafing, preening, and as brood platforms, but may also be useful for incubation if predators or high water disturb the primary nest (Eddleman and Conway 1994). Populations of this species occur in the Palo Verde and Imperial valleys. This subspecies is partially migratory, with many birds wintering in brackish marshes along the Gulf of California but some remain on their breeding grounds throughout the year (Bureau of Land Management 2001). Yuma clapper rails are found around the Salton Sea, and in agricultural drains and canals that support marsh vegetation (i.e., cattail, giant bulrush, alkali bulrush, and common reed). This subspecies breeds only in the lower Colorado River Valley and in the Salton Sink, the latter area holding about 40% of the United States population (Setmire *et al.* 1990). The breeding site for the largest population of the Yuma clapper rail in the United States is at the Wister unit of the CDFG Imperial Wildlife Area, near the Salton Sea. The sea's elevation is important to the Yuma clapper rail (USDOI 1998) as clapper rails use shallow freshwater habitat that has formed at the mouths of many of the inflows to the Salton Sea. Yuma clapper rails avoid deeper water because it increases juvenile mortality (CDFG 1990).

The Yuma clapper rail apparently expanded its range in the early 1900's in response to changes in the vegetation along the Colorado River. Damming and associated changes in hydrology induced vegetation changes in some areas that favored rails. At the same time, damming and diversion of the Colorado River reduced the amount of water flowing into the Colorado River Delta, and reduced the availability of rail habitats in the Delta. Approximately two-thirds of the formerly extensive marshlands of the Delta disappeared following completion of Hoover Dam (Sykes 1937).

Yuma clapper rail habitat has been further affected by channelization, fill, dredging projects, bank stabilization, and water management practices along the Colorado River. Three Fingers Lake and Davis Lake were lost as Yuma clapper rail habitat from river channelization (USFWS 1983), but recently may have been reconnected to the river (Leslie Fitzpatrick, USFWS, pers. comm.). Cibola Lake experienced marsh destruction when channelization work was completed for that stretch of the river, but it has been subject to ongoing restoration efforts (Lesley Fitzpatrick, USFWS, pers. comm.). Rail habitat has also been adversely affected by the spread of salt cedar (*Tamarisk ramosissima*). Salt cedar consumes an unusually high amount of water, which results in reduced wetland areas for vegetation preferred by the rail.

Another threat to the Yuma clapper rail is environmental contamination due to selenium. High selenium levels have been documented in crayfish, a primary prey of clapper rails, and some adult birds and eggs. Other threats to the Yuma clapper rail include mosquito abatement activities, agricultural activities, development, and the displacement of native habitats by exotic vegetation (CDFG 1991). The population of Yuma clapper rails at the Cienega de Santa Clara is threatened by the loss of the source of water that maintains the wetland habitat.

On March 11, 1967, the Service determined the Yuma clapper rail to be an endangered species (32 FR 4001, USFWS 1967). The State of California added the bird to its list of rare wildlife in May of 1971 and later listed it as threatened on February 22, 1978 (USFWS 1983). The Yuma Clapper Rail Recovery Plan, approved in 1983, provides background information on the species and identifies new or ongoing tasks necessary to achieve recovery of this species. This includes the long-term preservation of habitat in breeding and wintering areas of the United States and Mexico, and maintenance of suitable flows throughout the lower Colorado River. Many of the currently occupied breeding sites in the United States are on State and Federal lands that are protected and managed for wildlife. However, adequate water supplies are needed to assure the long-term availability of this habitat. Wintering areas and needs are not well known and require further study before habitat preservation needs can be determined. Many of the Mexican breeding sites are located in the Rio Colorado Delta area and require adequate flows in the lower Colorado River for long-term use by Yuma clapper rails.

California Black Rail

The black rail is the smallest of the North American rails. The adults are pale to blackish gray with white streaking on the undertail covers and flanks and a short, black bill. The nape and upper back are chestnut in color. The California subspecies is smaller and brighter than the Eastern black rail (*L. j. jamaicensis*; Eddleman *et al.* 1994). The California black rail is a secretive rail. Unlike other rails, the black rail is most vocal in the middle of the night.

The California black rail's diet consists mostly of insects, but also includes some crustaceans, and seeds of aquatic vegetation. Flores and Eddleman (1991) studied black rail diets and food availability at Mittry Lake and found that black rails consume a wide variety of invertebrates throughout the year, including beetles, earwigs, ants, grasshoppers, and snails. When invertebrate availability drops during the winter months, a larger portion of cattail and bulrush seeds is consumed. Lower resource availability in winter causes black rails to experience a significant weight loss, indicating they are more vulnerable to stress during this time. The California black rail forages by ground gleaning (Scott 1987; Ehrlich *et al.* 1988).

The California black rail inhabits fresh, brackish, and salt water marshes, occasionally wet savannah, and rarely dry grassland. Preferred habitat of the California black rail is characterized by minimal water fluctuations that provide moist surfaces or very shallow water, gently sloping shorelines, and dense stands of marsh vegetation (Repking and Ohmart 1977). Studies conducted along the lower Colorado River suggest that habitat structure and water depths are more important factors than plant composition in determining black rail use of wetland habitats. Unsuitable water and structural conditions appear to restrict the California black rail to only a fraction of the emergent vegetation available within an entire wetland (Flores and Eddleman 1991). In general, Flores and Eddleman (1991) found that black rails used marsh habitats with high stem densities and overhead coverage that were drier and closer to upland vegetation than randomly selected sites. Marsh edges with water less than 1 inch deep dominated by California bulrush and three-square bulrush are used most frequently. Areas dominated by cattail are also used regularly, but only in a small proportion to their availability and generally within 165 feet of upland vegetation where water depth is 1.2 inches. Telemetry studies at Mittry Lake found black rails to be sedentary, with home

ranges averaging 1.2 acres or less (Flores and Eddleman 1991). The erratic movements recorded for some juvenile and unmated birds during this research were consistent with the "wandering" behavior attributed to this subspecies and supports the idea that black rails may be capable of quickly occupying newly created habitats (Flores and Eddleman 1991).

Nesting biology of the California black rail is poorly understood. Double clutching and re-nesting may be fairly common in this subspecies. Both sexes assist in incubation and brood rearing, suggesting the species is monogamous, but the duration of its pair bond and variations in its mating system are still unstudied (Eddleman *et al.* 1994). These behaviors, combined with a relatively large clutch size, long breeding season, apparently low predation rates, and aggressive nest defense, suggest that the black rail has a high reproductive potential that is likely limited by the availability of shallow water environments (Eddleman *et al.* 1994; Flores and Eddleman 1991).

The California black rail occurs in the lower Colorado River area from the Imperial Dam, south to the Mexican border, with smaller, isolated populations scattered along the California coast from San Luis Obispo to San Diego Counties. It also occurs in the San Bernardino/Riverside area and at the Salton Sea (CDFG 1991). Along the lower Colorado River, the California black rail is a permanent resident in the vicinity of Imperial Dam and Bill Williams Delta (Snider 1969, Repking and Ohmart 1977). Black rails are also thought to breed in Cienega de Santa Clara, one of the only three breeding localities for this species in Mexico and one of the few for the subspecies anywhere (Piest and Campoy 1998).

In the proposed project area, appropriate habitats are found primarily in the managed wetlands on the state and federal wildlife refuges, in wetland areas adjacent to the Salton Sea, and in marsh habitats supported by seepage from the All American Canal and adjacent to the East Highline Canal, Finney Lake, and Salt Creek (Garrett and Dunn 1981). Black rails may use agricultural drains in the valley, although they have not been found to make extensive use of agricultural drains in previous surveys. Vegetation along agricultural drains mainly consists of common reed and tamarisk, species that are not generally used by black rails. Areas of cattails and bulrushes do exist along the drains. However, these areas are small and narrow and often interspersed with other vegetation, such as common reed. The habitat value of marsh vegetation supported by agricultural drains is probably limited and may only support foraging by black rails. The value of the drains to California black rails is also likely to be limited by their frequent water fluctuations, varying depths, and steep side slopes.

The North American population of black rails has very small and discontinuous ranges restricted largely to the United States. California black rail populations declined substantially between the 1920s and 1970s due to the loss and degradation of coastal salt marsh and inland freshwater marsh habitats (Eddleman *et al.* 1994, CDFG 1991). Along the lower Colorado River, black rail populations declined an estimated 30 percent between 1973 and 1989, with the majority of birds shifting from north of Imperial Dam to Mittry Lake during the same period (Eddleman *et al.* 1994). The effect of selenium in the lower Colorado River on black rails remains unknown, but toxic levels of this contaminant may also threaten black rail populations in the action area (AGFD 1996, Eddleman *et al.* 1994, Flores and Eddleman 1991). The lower Colorado River population and the small population in the Salton Sea area represent the only stable populations of this subspecies

(Eddleman *et al.* 1994, Rosenberg *et al.* 1991). The California black rail was listed as threatened by the State of California in 1971 (USFWS 1994, 1996).

California Brown Pelican

Brown pelicans (*Pelicanus occidentalis*) are recognized by their large size, impressive wingspan (up to 2 meters), short legs, distinctive long, hooked bill, and flexible lower mandible from which the highly expandable gular pouch is suspended. Six subspecies of brown pelicans have been described where the geographic variation in size is the primary distinguishing feature (Wetmore 1945). Unlike other brown pelican subspecies, the California brown pelican typically has a bright red gular pouch (the basal portion) that contrasts with its dark neck and is most visible during the courtship and egg-laying period (USFWS 1983).

The California brown pelican is found in marine habitats which range from the open ocean to inshore waters, estuaries, bays, and harbors. Pelicans commonly use undisturbed beaches, breakwaters, and jetties near coastal bays as roosting areas and forage nearby. They breed on specific offshore islands of southern California and northwestern Baja California, Mexico. Nesting colonies can be found on the Channel Islands, the Coronado Islands, and on the islands in the Gulf of California (Garrett and Dunn 1981). Brown pelicans are colonial nesters, and breeding is typically initiated in late December or early January. The nest is a small mound of sticks or debris on rocky, or low, brushy slopes of undisturbed islands (Cogswell 1977), usually on the ground and less often on bushes (Palmer 1962). After breeding, they begin migrating as early as mid-May. Individuals leave colonies in the Channel Islands and in Mexico and disperse along the entire California coast. During the nesting season, they generally stay within 20 kilometers of nesting islands (Briggs *et al.* 1981). Brown pelicans lay eggs from March to April, but records have indicated egg laying even as late as June (Palmer 1962). Clutch size is usually 3 eggs, sometimes 2 with a single brood each year. Incubation lasts about 4 weeks. Young are altricial and cared for by both parents, but they fledge at about 9 weeks. Brown pelicans first breed at about 3-5 years of age.

Brown pelicans are diurnal and active throughout the year. In California brown pelicans feed primarily on northern anchovy, Pacific sardine, and Pacific mackerel (Thelander and Crabtree 1994). Brown pelicans generally forage in early morning or late afternoon, or when the tide is rising. They feed almost entirely on fish, caught by diving from 6-12 meters in the air, and occasionally from up to 12 meters. They may completely or partially submerge, and water may be shallow or deep. Occasionally brown pelicans will feed on crustaceans, carrion, and young of its own species (Palmer 1962). They usually rest on water or inaccessible rocks (either offshore or on mainland), but will also use mudflats, sandy beaches, wharfs, and jetties. They do not roost overnight on water, rather they concentrate at a few traditional roosts on the mainland or islands (Briggs *et al.* 1981). They cannot remain on the water for more than one hour without becoming water-logged, and they require undisturbed roosts where they can dry and maintain their plumage during the day and at night (Schreiber and Schreiber 1982). Schreiber and Schreiber (1982) identified the need for this species to have year round access to undisturbed loafing and roosting sites in proximity to foraging areas. This need was reinforced in the Recovery Plan for this species (USFWS 1983) that identified roosting and loafing areas as essential habitat.

The current breeding distribution of the brown pelican ranges from the Channel Islands off southern California southward (including the Baja California coast and the Gulf of California) to Isla Isabella, and Islas Tres Marias off Nayarit, Mexico, and Isla Ixtapa off Guerrero, Mexico. About 45,000 pairs nest on Mexico's west coast (Ehrlich *et al.* 1992) including approximately 35,000 pairs in the Gulf of California (David Pereksta, USFWS, pers. comm. 2002), and this population is considered stable at this time (Dan Anderson, University of California at Davis, pers, comm.). Between breeding seasons, brown pelicans may range as far north as Vancouver Island, British Columbia and south to Central America. As plunge divers, they require relatively clear water to visually locate their prey from on the wing. The largest numbers of brown pelicans (most of which derive from Mexican colonies) appear in California during late summer and fall. Year-to-year post-breeding dispersal patterns of brown pelicans are, however, largely determined by the oceanographic conditions which influence anchovy availability.

The brown pelican is a common post-breeding visitor to the Salton Sea, with numbers steadily increasing over the past decades from the first records beginning in the early 1950s (Patten *et al.*, in press). This species does not occur elsewhere inland in such numbers or with such regularity. In fact, the brown pelican colony closest to the Salton Sea is about 220 miles away, on San Luis Island in the Gulf of California (IID 1994). The Salton Sea currently supports a year-round population of California brown pelicans, where during the past few years single-day counts have sometimes exceeded 3,000 individuals (Patten *et al.*, in press). Records indicate that a brown pelican nested successfully in 1996 at the Salton Sea (the first nesting of a California brown pelican on an inland lake) and exhibited nesting activity in 1997 and 1998 (Charlie Pelizza, Sonny Bono Salton Sea NWR, pers. comm.). Because brown pelicans are associated with large open water bodies, habitat for brown pelicans in the proposed project area principally occurs at the Salton Sea where abundant fish populations provide foraging opportunities for brown pelicans. This species occurs almost anywhere along the shoreline of the Salton Sea, most often around rock outcrops and embankments. The brown pelican has nested on small islands of volcanic rock with a sandy base and at the Alamo River mouth on beds of matted reeds. From June through September they can be found at least occasionally on virtually every body of water in the Imperial Valley (Patten *et al.*, in press). In addition to the Salton Sea, brown pelicans are known to forage at Finney Lake in the Imperial Wildlife Area (U.S. Army Corps of Engineers 1996).

Juvenile brown pelicans tend to disperse the farthest from their natal site than any other age class and prefer estuaries over open coastal areas. As birds reach sexual maturity (3-5 years), it has been suggested that the birds return back to their natal site and rarely settle at another colony. Thus, birds that now use the Salton Sea are more likely to stay in the Gulf of California once the Salton Sea is no longer a viable source of fish. However, band returns indicate that brown pelicans are capable of moving from the southern California coast to the Salton Sea. Adults may also use specific wintering areas rather than disperse like the juveniles.

Brown pelicans declined greatly in the mid-20th century because of human persecution and disturbance of nesting colonies. This species has also experienced widespread pollutant-related reproductive failures during the late 1960's and early 1970's due to the use of DDT and the resultant egg-shell thinning. Because of these declines, the brown pelican was classified as endangered by the Service on October 13, 1970 (35 FR [2] 16047, USFWS 1970). As of the

1990's, the ecological effects of DDT contamination still had not been entirely eliminated within the Southern California Bight, and incidences of eggshell thinning do occur but at a greatly reduced frequency as compared to the early 1970's. Acute contamination of the Southern California Bight water mass by DDT compounds has thus been replaced by low-level, chronic contamination. Complete recovery of the brown pelican reproductive rates from past pesticide contaminations may still be years away as DDT and its known breakdown product DDE are quite persistent in the environment. Although its use is banned in the United States (Bennett 1996), it is still present in the Imperial Valley and Salton Sea which can affect the brown pelican's reproductive success as a result of bioaccumulation of DDE from foraging at the Salton Sea during the non-breeding season (USFWS 1996).

Brown pelicans also have been impacted by disturbance of their nesting colonies by fishing and recreational activities, particularly in the Southern California Bight (David Pereksta, USFWS, pers. comm.). Better regulation of human access (particularly at the Los Coronados Islands colony) and exotic predators would likely increase the nesting success of brown pelicans in these colonies by reducing the rate of nest abandonment.

Brown pelicans in the Southern California Bight rely largely on schooling fish species such as anchovy and sardine (USFWS 1983). This species would benefit from tighter controls over commercial fishing of these species, particularly in the vicinity of the breeding colonies. Impacts of commercial fishing can be magnified in years with the "El Niño Southern Oscillation" when warm currents drive fish schools north of the breeding colonies. Prey availability may be limiting the productivity of the Southern California Bight colonies; the reproductive rates have been relatively constant and below recovery targets for several years (Frank Gress, University of California at Davis, pers. comm.).

ENVIRONMENTAL BASELINE

Desert Pupfish

Desert pupfish were abundant along the shore of the Salton Sea through the 1950s (Barlow 1961). During the 1960s, the numbers declined, and by 1978 they were noted as scarce and sporadic (Black 1980). Declines are thought to have resulted from the introduction and establishment of several exotic tropical species into the Salton Sea (Bolster 1990; Black 1980). These introduced species prey on or compete with desert pupfish for food and space. Other factors responsible for declines in desert pupfish populations include habitat modification due to water diversions and groundwater pumping for agriculture (Pister 1974; Black 1980). There is also concern that introduced saltceder (tamarisk) near pupfish habitat may cause a lack of water at critical times due to evapotranspiration (Marsh and Sada 1993). Aerial pesticide application is a common practice around the Salton Sea that may also affect pupfish populations (Marsh and Sada 1993).

Desert pupfish occur in Salt Creek and San Felipe Creek and its tributaries. This species also occurs at and within the mouths of agricultural drains that discharge directly to the Salton Sea and shoreline pools along the edge of the Salton Sea. Desert pupfish have been located in agricultural drains within the proposed project area on the northwest, southwest, south, and southeast sides of

the Salton Sea. These drains currently number 52 total with 29 in IID's jurisdiction and 23 in CVWD's area. Maintaining these populations in the long-term has been determined to be necessary for the recovery of the species (USFWS 1993). Based on our current understanding, this includes maintaining the drain populations and providing for pupfish movement between individual drains. A status report for the desert pupfish is in preparation by the CDFG. They report that populations of desert pupfish in San Felipe and its tributaries are stable. Tilapia were present in San Felipe Creek in 1997, but they are now extirpated. Some other non-native fish may be present, but they are not considered a threat to pupfish populations in that location (Bureau of Land Management 2001).

Cooperative monitoring surveys have been conducted in 1993, 1994, and in 1996 for desert pupfish in non-refugium habitats in the Salton Sea, specifically in the mouths of irrigation drains and in two shoreline pools. The total number of pupfish trapped in 1993 was 504. In 1994 the total number was 538, however 259 of the pupfish were found dead in the traps that year (Michael Remington, IID, pers. comm.). Pupfish were trapped in over half of the 29 possible locations in the irrigation drains and shoreline pools tested in the 1993 and 1994 surveys. Results from the 1996 surveys indicated that the pupfish were only caught in the Trifolium Storm drain (16 pupfish), Trifolium 20-A (13 pupfish), San Felipe Wash (31 pupfish), Trifolium 19 (1 pupfish), Trifolium 12 (1 pupfish), Trifolium 23 (1 pupfish), Trifolium 1 (1 pupfish), and the "R" drain (1 pupfish; Sharon Keeney, CDFG, pers. comm.; and Michael Remington, IID, pers. comm.). The total number trapped in the 1996 survey was 65 pupfish. A study conducted by Sutton (2000) in 1999 that focused on the movement of pupfish between drains and creeks and their associated shoreline pools. This was not a comprehensive survey, but the total number of individuals captured was 3,239. The vast majority of these were found in two locations: the Trifolium 20A drain and the shoreline pool associated with the Trifolium 23 drain. More recent and limited surveys by the U.S. Geological Survey (USGS) found 217 desert pupfish in three locations around the north end of the Salton Sea (Barbara Martin, USGS, pers. comm.), but these surveys were not designed to estimate the desert pupfish population at the Salton Sea.

Yuma Clapper Rail

In California this species nests along the lower Colorado River, in wetlands along the Coachella Canal, the Imperial Valley, the upper end of the Salton Sea at the Whitewater River delta, and Salt Creek (NatureServe 2001). Hydroelectric dams along the Colorado River have apparently increased the amount of marsh habitat, and population numbers of the Yuma clapper rail may have increased expanding the range northward in response to the increase in available habitat (Bureau of Land Management 2001). Also, habitat was expanded through the creation of the Salton Sea in the early 1900s. The population along the lower Colorado River was estimated in the 1980s at 550-750 in the U.S. and 200 in Mexico (NatureServe 2001). The action area essentially covers the U.S. range of the species.

In the proposed project area, the principal concentrations of Yuma clapper rails are at the south end of the Salton Sea near the New and Alamo River mouths, at the Sonny Bono Salton Sea NWR, at the Wister Unit of the Imperial Wildlife Management Area, Imperial NWR, Cibola NWR, Mittry Lake, West Pond, Bill Williams Delta, Topock Gorge, Topock Marsh and at Finney Lake in the

Imperial Wildlife Management Area. As many of these areas occur on state reserve or NWR lands, these state and federal properties will continue to have a major role in the long-term conservation of this species. Continued access to adequate water to maintain these habitats will be a key factor in the long-term management of the Yuma clapper rail.

Between 1995 and 2002, an average of 306 rails have been counted around the Salton Sea, and an average of 276 were counted in the same period along the lower Colorado River corridor (USFWS, unpublished data). The Imperial Valley population represents an estimated 42 percent of the entire U.S. population of this species (Point Reyes Bird Observatory 1999; USFWS 1999; Lesley Fitzpatrick, USFWS, pers. comm.). Despite representing a sizeable proportion of the subspecies' population, overall numbers at the Salton Sea are modest (Patten *et al.*, in press). For example, only 96 individuals were censussed around the south end of the Salton Sea during the summer of 1993 (*AB* 47:1149 AB) and only 279 were located during extensive surveys in 1999 (Shuford *et al.* 2000). Principal regional sites are the Wister Unit of the Imperial Wildlife Area, Unit 1 of the Sonny Bono Salton Sea NWR, and adjacent marshes around the New River. Yuma clapper rails have been found outside these refuge areas also. Between 1995 and 2002, a range of 3 to 42 (average of 20) clapper rails were counted outside the refuges (USFWS unpublished data). This includes the Trifolium 1 and Holtville Main irrigation drains (Steve Johnson, Sonny Bono Salton Sea NWR, pers comm.; Hurlbert et al. 1997). A maximum count in the Holtville Main drain at one time was 5 pairs and 2 individuals (USFWS unpublished data). This particular drain is unusual for its length (17.8 miles) and extent of vegetation (Hurlbert *et al.*, 1997), and it may be more likely than most drains in the system to provide habitat for Yuma clapper rails given those characteristics. In 1994, 2 pairs and 2 single rails were heard calling in the Bruchard drain during breeding season surveys (Ken Sturm, Sonny Bono Salton Sea NWR, pers. comm.).

California Black Rail

Black rails occur along the lower Colorado River, with approximately 100 to 200 individuals estimated to occur from Imperial National Wildlife Refuge south to Mittry Lake (Rosenberg *et al.* 1991). In more recent surveys a total of 100 individuals were counted at 20 sites along the lower Colorado River (Courtney Conway, USGS, unpublished data). Of this total 62 black rails were found in Arizona, and 38 were in California.

This species was presumed to be rare and infrequent in the Salton Sea area until the late 1970s, when it was discovered that small numbers were present in the Imperial Valley and elsewhere around the Salton Sea. Other regional records from the late 1970s through the 1980s are from the vicinity of the New River mouth and Fig Lagoon. The species persisted at Finney Lake through the 1980s but disappeared when the CDFG drained the lakes for renovation, with the last bird recorded in April 1989 (Evens *et al.* 1991). A study by Jurek (1975) and other investigators in 1974 and 1975 identified eight marsh areas with black rails between the Coachella and East Highline Canals south of Niland. Six individual records near Niland from January and February (Patten *et al.*, in press) suggest that black rails are resident at the Salton Sink, but it may be only a sporadic winter visitor to the Salton Sink area (Garrett and Dunn 1981; Evens *et al.* 1991). The Coachella Canal south of Niland was concrete-lined in 1981, and all black rail habitat supported by canal seepage was desiccated (Evens *et al.* 1991). More recently, black rails were censussed along the All

American Canal during April and May of 1988 in conjunction with Yuma clapper rail surveys. A minimum of three black rails was recorded for the area. In the a systematic survey for the species at the Salton Sea and surrounding areas in 1989, 15 birds were recorded in the Salton Sea area (Laymon *et al.* 1990). In 1999, the Point Reyes Bird Observatory failed to find the species during focused surveys for it around the south end of the Sea (B. Mulrooney in Patten *et al.*, in press). In 2000 Courtney Conway (USGS, unpublished data) found no California black rails in surveys around the Salton Sea area. These surveys also covered the seepage areas along the All American and Coachella Canals, and black rails were located in these surveys. A total of 21 were reported along the All American Canal and six along the Coachella Canal. Another five black rails were found along the New River. The reproductive status of these birds is uncertain, although some locations have had numerous calling birds over a period of several weeks in the spring, suggesting a breeding population (Reclamation and Salton Sea Authority 2000).

California Brown Pelican

Food availability, disturbance, and oceanic pollution currently appear to be the major limiting factors to populations of California brown pelicans (USFWS 1983). Potential threats related to these limiting factors include commercial fisheries, oil development, recreational fisheries, sonic booms and increased tourism (USFWS 1983). Most North American populations of this species were extirpated by 1970. Since the banning of DDT and other organochlorine use in the early 1970s, brown pelicans have made a strong recovery and are now fairly common and perhaps still increasing on the southeast and west coasts (Kaufmann 1996). The endangered Southern California Bight population of the brown pelican grew to 7,200 breeding pairs by 1987, but has experienced considerable population fluctuations in recent years and has not been considered sufficiently stable for delisting (CDFG 1992). In 1992 there were an estimated 6,000 pairs in Southern California. Future restoration efforts (currently being planned) to reduce the existing DDT contamination in the Southern California Bight would be beneficial to this breeding population.

The Salton Sea is part of the Rio Colorado Delta, and the brown pelicans at the Sea are most likely affiliated with the breeding colonies in the Gulf of California. Brown pelicans probably had little historical use of the Salton Sea (Anderson 1993), although the Salton Sea may have recently taken on greater importance for these birds as a result of the degradation of habitat in the Delta. Some visiting postbreeding pelicans were documented at the Salton Sea in the late 1970s, but overwintering was not confirmed until 1987. Use of the Salton Sea by brown pelicans subsequently increased. Now use is largely seasonal, typically numbering 1,000 to 2,000 birds, with peak numbers ranging from 4,000 to 5,000 birds in the late summer/early fall (Charles Pelizza, Sonny Bono Salton Sea NWR, pers. comm.). The age structure also varies seasonally with brown pelicans at the Salton Sea where adults dominate in the spring and juveniles arrive in the summer and are followed by adults in the late summer/early fall. Based on behavioral observations, the brown pelicans using the Salton Sea may come from a single breeding colony in the northern Gulf of California (Dan Anderson, University of California at Davis, pers. comm.). If these birds have become dependent on the Salton Sea to supplement their non-breeding forage requirements, the impacts of the loss of access to the Sea may have a greater impact than if the effects were spread throughout the Gulf of California population as a whole.

Brown pelicans at the Salton Sea roost predominantly at Obsidian Butte, Mullet Island, and the sand bars associated with the three river mouths (Charles Pelizza, Sonny Bono Salton Sea NWR, pers. comm.). Other areas are used in low numbers (e.g., the break waters along the south end of the Salton Sea), but these areas are subject to various human activities (e.g., vehicle use and fishing) and thus are not consistently available. The high use areas are currently surrounded completely or largely by shallow water, and they may be lost as functional roosts due to greater accessibility to terrestrial species as the Salton Sea recedes.

The brown pelican was first found to nest successfully at the Salton Sea in 1996 with 3 nests resulting in nine fledglings. Although pairs attempted to nest in 1997, five nests were unsuccessful due to flooding. An undocumented number of nesting attempts were observed in 1998, but no successful nests were established. No nesting activity has been recorded since 1998 (Charles Pelizza, Sonny Bono Salton Sea NWR, pers. comm.).

Brown pelicans have experienced losses at the Salton Sea as a result of annual outbreaks of avian botulism since 1996 (USFWS unpublished data). The greatest losses occurred in 1996 with a total of 2,034 birds affected by the botulism event. The losses have been less since that 1996 event, with numbers of brown pelicans affected ranging from 274 to 1,311. Given the increased effort to identify and rehabilitate sick birds, the number of mortalities relative to the total number of pelicans affected has decreased overall since the 1996 event. The cause of these annual outbreaks has not been determined conclusively, but the Salton Sea's highly eutrophic condition may be a contributing factor.

EFFECTS OF THE ACTION

Desert Pupfish

The desert pupfish is known to use irrigation drains that flow directly into the Salton Sea and the Salton Sea itself, and this species will be affected by water conservation-related changes in those two areas. These impacts are expected to be associated with potential reductions in habitat, increases in selenium concentrations in the drains, and physical/chemical barriers to movement in the Salton Sea that could result in isolating sub-populations within individual drains.

The water conservation activities proposed by IID will result in the reduction of flows in the drains that flow directly to the Salton Sea by 7-39 percent, depending on the proportion of fallowing to efficiency conservation conducted for the water transfer. Narrower and/or shallower flows may result in a physical reduction of habitat for the desert pupfish despite Reclamation's commitment to maintain the current linear extent of the desert pupfish habitat and the expectation that drains will be extended as the Salton Sea elevation goes down. Because the program is based on voluntary participation by farmers that will vary over time, specific reductions in the flows of individual drains cannot be determined. While the quantity of habitat may be reduced, the quality may be increased if the flow reductions result in fewer exotic species using the drains. *Tilapia zillii* and other exotic fish species are known to use the drains in addition to the desert pupfish. *Tilapia zillii*, in particular, favors deeper water for spawning, but desert pupfish are expected to use shallower depths than most other species (Marsh and Sada 1993). Thus, decreases in depth of flow may

offset the losses of physical habitat that occur by suppressing competition and/or predation by exotic species. The effect in this case is expected to be neutral or positive because decreases in depth are not expected to enhance and may reduce the reproduction of exotic species. If width decreases without adequate changes in depth, the desert pupfish could be confined to smaller physical space without a reduction in competitors and/or predators. This could result in a negative effect associated with the reduction in flows if not offset be the increased length of the drains as the Salton Sea recedes. Water conservation is expected to reduce the loading of suspended sediments and sediment-associated contaminants (e.g., phosphorus and organochlorine pesticides) into the aquatic environment, which could benefit desert pupfish. The net effect of these changes cannot be quantified at this time, but take in the form of harm may occur from reduced flows that result in reduced habitat and/or increased competition and predation in those drains in the IID system that flow directly to the Salton Sea.

As a result of the use of on-farm and systems water conservation, the Imperial Irrigation Decision Support System (IIDSS) model output indicates that selenium concentrations will increase over time to higher concentrations than are anticipated under the baseline. The concentrations under the proposed project are anticipated to be 2.24 to 11.7 µg/L in the drains that flow directly to the Salton Sea whereas those concentrations were predicted by the model to be 2.24 to 8.48 µg/L under the baseline. The mean concentration under the proposed project (5.88 µg/L) exceeds the baseline mean concentration (4.70 µg/L) by 1.18 µg/L. However, a study of surface drain water conducted in 1994 found concentrations of selenium in the range of 2 to 52 µg/L, with a mean concentration of 6 µg/L (Setmire 1999). This suggests that the predictions provided by the model are somewhat low and should be used with caution. The BA provides long-term average concentrations for selenium in the surface drains of the Alamo and New River Basins. These concentrations are representative of the average concentrations in drain water in each of those basins. These concentrations are 7.9 and 7.4 µg/L selenium, respectively, and they also suggest that the concentrations provided by the model for the direct-to-Sea drains may underestimate the future concentrations.

As part of a study recently funded by the Service, samples were collected from various drains and shoreline pools potentially occupied by desert pupfish. In this effort water, sediment, plant material, and surrogate fish samples were collected. Despite the fact that none of the drain water samples had detectable concentrations of selenium (detection limit of 5.6 µg/L), the other sample matrices had detectable concentrations which in many cases exceeded levels of concern. The sediment samples for the sampled drains had concentrations that ranged from <0.519 to 5.86 mg/kg dry weight (DW). The vegetation samples had concentrations that ranged from <0.992 to 3.97 µg/g DW. The whole body surrogate fish samples had concentrations that ranged from 3.38 to 14.7 µg/g DW. All 37 surrogate fish samples showed concentrations that exceeded 3 µg/g DW, and 35 of the 37 exceeded 4 µg/g DW.

Hazards of Selenium

Selenium Sources

Selenium, a semi-metallic trace element with biochemical properties very similar to sulfur, is widely distributed in the earth's crust, usually at trace concentrations (<1 µg/g, ppm; e.g., Wilber 1980; Eisler 1985). Some geologic formations, however, are particularly seleniferous (e.g., Presser and Ohlendorf 1987, Presser 1994, Presser *et al.* 1994, Piper and Medrano 1994, Seiler 1997, Presser and Piper 1998), and when disturbed by anthropogenic activity provide pathways for accelerated mobilization of selenium into aquatic ecosystems. Abnormally high mass-loading of selenium into aquatic environments is most typically associated with the use of fossil fuels, with intensive irrigation and over-grazing of arid lands, and with mining of sulfide ores (Skorupa 1998). Intensive confined livestock production facilities and municipal wastewater treatment plants may also contribute to accelerated mass-loading of selenium into surface water bodies. Agricultural irrigation over large areas of the western United States causes accelerated leaching of selenium from soils into groundwater. Natural and anthropogenic discharge of subsurface agricultural drainage water to surface waters is a major pathway for the mass-loading of selenium into aquatic ecosystems (Presser *et al.* 1994, Presser 1994, Seiler 1997, Presser and Piper 1998, Skorupa 1998).

Toxicity

For vertebrates, selenium is an essential nutrient (Wilber 1980). Inadequate dietary uptake (food and water) of selenium results in selenium deficiency syndromes such as reproductive impairment, poor body condition, and immune system dysfunction (Oldfield 1990; CAST 1994). However, excessive dietary uptake of selenium results in toxicity syndromes that are similar to the deficiency syndromes (Koller and Exon 1986). Thus, selenium is a "hormetic" chemical, i.e., a chemical for which levels of safe dietary uptake are bounded on both sides by adverse-effects thresholds. Most essential nutrients are hormetic; what distinguishes selenium from other nutrients is the very narrow range between the deficiency threshold and the toxicity threshold (Wilber 1980, Sorensen 1991). Nutritionally adequate dietary uptake (from feed) is generally reported as 0.1 to 0.3 µg/g (ppm) on a dry feed basis, whereas, the toxicity threshold for sensitive vertebrate animals is generally reported as 2 µg/g (ppm). That dietary toxicity threshold is only one order-of-magnitude above nutritionally adequate exposure levels (see review in Skorupa *et al.* 1996, USDI-BOR/FWS/GS/BIA 1998).

Hormetic margin-of-safety data suggest that environmental regulatory standards for selenium should generally be placed no higher than one order of magnitude above normal background levels (unless there are species-specific and site-specific data to justify a variance from the general rule). For freshwater ecosystems that are negligibly influenced by agricultural or industrial mobilization of selenium, normal background concentrations of selenium have been estimated as 0.25 µg/L (ppb; Wilber 1980), 0.1-0.3 µg/L (ppb; Lemly 1985), 0.2 µg/L (ppb; Lillebo *et al.* 1988), and 0.1-0.4 µg/L (ppb; average <0.2, Maier and Knight 1994).

Direct Waterborne Contact Toxicity

Selenium occurs in natural waters primarily in two oxidation states, selenate (+6) and selenite (+4). Waters associated with various fossil-fuel extraction, refining, and waste disposal pathways contain selenium predominantly in the selenite (+4) oxidation state. Waters associated with irrigated

agriculture in the western United States contain selenium predominantly in the selenate (+6) oxidation state. Based on traditional bioassay measures of toxicity (24- to 96-hour contact exposure to contaminated water *without* concomitant dietary exposure), selenite is more toxic than selenate to most aquatic taxa (e.g., see review in Moore *et al.* 1990).

Most aquatic organisms, however, are relatively insensitive to waterborne contact exposure to either dissolved selenate or dissolved selenite, as adverse-effects generally occur at concentrations above 1,000 µg/L (ppb). By contrast, waterborne contact toxicity for selenium in the form of dissolved seleno-amino-acids (such as selenomethionine and selenocysteine) has been reported at concentrations as low as 3-4 µg/L (ppb) for striped bass (*Morone saxitilis*; Moore *et al.* 1990). It would be expected, however, that at a long-term concentration of 5 µg/L (ppb) *total selenium* the concentration of dissolved seleno-amino-acids would be substantively below 3-4 µg/L (ppb) because seleno-amino-acids usually make up much less than 60-80 percent of *total dissolved selenium* in natural waters. For example, it was estimated that organoselenium made up only 4.5 percent of the total dissolved selenium in highly contaminated drainage water from the San Joaquin Valley (Besser *et al.* 1989). Under most circumstances, a long-term concentration of 5 µg/L should be protective of aquatic life *with regard to direct contact toxicity*. Selenium, however, is bioaccumulative and therefore the direct contact exposure is only considered a minor exposure pathway for aquatic organisms (e.g., see review by Lemly 1996a).

Bioaccumulative Dietary Toxicity

Although typical concentrations of different chemical forms of selenium would be unlikely to cause direct contact toxicity at a long-term concentration of 5 µg/L (ppb), as little as 0.1 µg/L of dissolved selenomethionine has been found sufficient, via bioaccumulation, to cause an average concentration of 14.9 µg/g (ppm, dry weight) selenium in zooplankton (Besser *et al.* 1993), a concentration that would cause dietary toxicity to most species of fish (Lemly 1996a). Based on Besser *et al.* (1993) bioaccumulation factors (BAFs) for low concentrations of selenomethionine, as little as 6 ng/L of dissolved selenomethionine would be sufficient to cause food chain bioaccumulation of selenium to concentrations exceeding toxic thresholds for dietary exposure of fish and wildlife. Thus, at a chronic concentration of 5 µg/L (ppb) as *total selenium*, if more than 0.1 percent of the total dissolved selenium were in the form of selenomethionine, food chain accumulation of selenium to levels sufficient to cause dietary toxicity in sensitive species of fish and birds would occur. Unfortunately, relative concentrations of selenoamino-acids have not been determined in the field in California for waters where total selenium is found in the critical 1-5 µg/L range. Further research is required to characterize typical proportions of seleno-amino-acids in waters containing 1-5 µg/L (ppb) *total selenium.*

Based on waters containing 1-5 µg/L (ppb) *total selenium*, composite bioaccumulation factors (defined as: the total bioaccumulation of selenium from exposure to a composite mixture of different selenium species measured only as *total selenium*) for aquatic food chain items (algae, zooplankton, macro-invertebrates) are typically between 1,000 and 10,000 (on dry weight basis; Lillebo *et al.* 1988, Lemly 1996a). Therefore, based on risk from bioaccumulative dietary toxicity, a chronic concentration somewhere in the range of 0.2 to 2 µg/L (ppb) would not be expected to have adverse effects. More specifically, based on an analysis of bioaccumulative dietary risk and a

literature database, Lillebo *et al.* (1988) concluded that a chronic criterion of 0.9 µg/L (ppb) for *total selenium* is required to protect fish from adverse toxic effects. Furthermore, Peterson and Nebeker (1992) applied a bioaccumulative risk analysis to semi-aquatic wildlife taxa and concluded that a chronic standard of 1 µg/L (ppb) for *total selenium* was warranted. Most recently, Skorupa (1998) has compiled a summary of field data that includes multiple examples of fish and wildlife toxicity in nature at waterborne selenium concentrations below 5 µg/L (ppb), supporting the criteria recommendations of Lillebo *et al.* (1988) and Peterson and Nebeker (1992). A recently concluded regional survey of irrigation related selenium mobilization in the western United States, conducted jointly by several agencies of the U.S. Department of the Interior over a ten-year period, found that at 5 µg/L total selenium in surface waters about 60% of associated sets of avian eggs exceeded the toxic threshold for selenium, i.e., that 5 µg/L Se was only about 40% protective against excessive bioaccumulation of selenium into the eggs of waterbirds (Seiler and Skorupa, In Press).

Interaction Effects Enhancing Selenium Toxicity

Toxic thresholds for fish and wildlife dietary exposure to selenium have been identified primarily by means of controlled feeding experiments with captive animals (e.g., see reviews by NRC 1980, 1984, 1989; Heinz 1996, Lemly 1996a, Skorupa *et al.* 1996, USDI-BOR/FWS/GS/BIA 1998). Such experiments are carefully designed to isolate the toxic effects of selenium as a *solitary stressor*. Consequently, the toxic thresholds identified by such studies are prone to overestimating the levels of selenium exposure that can be tolerated, without adverse effects, in an environment with *multiple stressors* as is typical of the real ecosystems (Cech *et al.* 1998). There are at least three well-known multiple-stressor scenarios for selenium that dictate a very conservative approach to determining adequately protective concentrations for aquatic life:

1. Winter Stress Syndrome - More than 60 years ago it was first discovered in experiments with poultry housed in outdoor pens that dietary toxicity thresholds were lower for experiments done in the winter than at other times of the year (Tully and Franke 1935). More recently this was confirmed for mallard ducks (*Anas platyrhynchos*) by Heinz and Fitzgerald (1993). Lemly (1993), studying fish, conducted the first experimental research taking into account the interactive effects of winter stress syndrome and confirmed that such effects are highly relevant even for waters containing <5 µg/L (ppb) selenium. Consequently, Lemly (1996b) presents a general case for winter stress syndrome as a critical component of hazard assessments. It can be further generalized that any metabolic stressor (cold weather, migration, smoltification, pathogen challenge, etc.) would interact similarly to lower the toxic thresholds for dietary exposure to selenium. Based on a comparison of results from Heinz and Fitzgerald (1993) and Albers *et al.* (1996), the dietary toxicity threshold in the presence of winter stress was only 0.5-times the threshold level for selenium as a solitary stressor.

2. Immune System Dysfunction - Also more than 60 years ago, it was first noted that chickens exposed to elevated levels of dietary selenium were differentially susceptible to pathogen challenges (Tully and Franke 1935). More recently this was confirmed for mallard ducks by Whiteley and Yuill (1989). Numerous other studies have confirmed the physiological and histopathological basis for selenium-induced immune system dysfunctions in wildlife (Fairbrother and Fowles 1990,

Schamber *et al.* 1995, Albers *et al.* 1996). Based on Whiteley and Yuill's (1989) results, *in ovo* exposure of mallard ducklings to as little as 3 .9 µg/g (ppm dry weight basis) selenium was sufficient to significantly increase mortality when ducklings were challenged with a pathogen. The lowest confirmed *in ovo* toxicity threshold for selenium as a solitary stressor is 10 µg/g (ppm dry weight basis; Heinz 1996, reported as 3 µg/g wet weight basis and about 70% moisture). In this case the multiple-stressor toxicity threshold is only 0.39-times the threshold level for selenium as a solitary stressor.

3. Chemical Synergism - Multiple stressors can also consist of other contaminants. For example, Heinz and Hoffman (1998) recently reported very strong synergistic effects between dietary organo-selenium and organo-mercury with regard to reproductive impairment of mallard ducks. The experiment of Heinz and Hoffman (1998) did not include selenium treatments near or below the threshold for diet-mediated reproductive toxicity and therefore no ratio of single-stressor versus multiple-stressor threshold levels is available. A field study involving 12 lakes in Sweden, however, found that in the presence of threshold levels of mercury contamination, the waterborne threshold for selenium toxicity was about 2.6 µg/L (ppb; see review in Skorupa 1998, and review in USDI-BOR/FWS/GS/BIA 1998). Meili (1996) concluded that, "The results [of the Swedish Lakes studies] suggest that a selenium concentration of only 3 µg/L can seriously damage fish populations."

Environmental Partitioning and Waterborne Toxicity Thresholds

Risk management via water concentration-based water quality criteria is an inherently flawed process for selenium (Pease *et al.* 1992, Taylor *et al.* 1992, 1993; Canton 1997). The process is flawed because the potential for toxic hazards to fish and wildlife is determined by the rate of mass-loading of selenium into an aquatic ecosystem and the corresponding environmental partitioning of mass-loads between the water column, sediments, and biota (food chain). However, a water column concentration of selenium can be an imperfect and uncertain measure of mass-loading and food chain bioaccumulation. For example, a low concentration of waterborne selenium can occur because mass-loading into the system is low (= low potential for hazard to fish and wildlife) or because there has been rapid biotic uptake and/or sediment deposition from elevated mass-loading (= high potential for hazard to fish and wildlife). Toxicity to fish and wildlife is ultimately determined by how much selenium is partitioned into the food chain. Several examples of potentially hazardous food chain bioaccumulation of selenium at waterborne selenium concentrations <2 µg/L are known from California (Maier and Knight 1991, Pease *et al.* 1992, Luoma and Linville 1997, San Francisco Estuary Institute [SFEI] 1997a, Setmire *et al.* 1990, 1993; Bennett 1997) and elsewhere (Birkner 1978, Lemly 1997, Hamilton 1998).

Fish

A tremendous amount of research regarding toxic effects of selenium on fish has been conducted since the late 1970's. Recently, this body of research was reviewed and summarized by Lemly (1996b). Lemly reports that salmonids are very sensitive to selenium contamination and exhibit toxic symptoms even when tissue concentrations are quite low. Survival of juvenile rainbow trout (*Oncorhynchus mykiss*) was reduced when whole-body concentrations of selenium exceeded 5

µg/g (dry wt.). Smoltification and seawater migration among juvenile chinook salmon (*Oncorhynchus tshawytscha*) were impaired when whole-body tissue concentrations reached about 20 µg/g. However, mortality among larvae, a more sensitive life stage, occurred when concentrations exceeded 5 µg/g. Whole-body concentrations of selenium in juvenile striped bass collected from areas in California impacted by irrigation drainage ranged from 5 to 8 µg/g.

Summarizing studies of warm-water fish Lemly reports that growth was inhibited at whole-body tissue concentrations of 5 to 8 µg/g selenium or greater among juvenile and adult fathead minnows (*Pimephales promelas*). Several species of centrarchids (sunfish) exhibited physiologically important changes in blood parameters, tissue structure in major organs (ovary, kidney, liver, heart, gills), and organ weight-body weight relations when skeletal muscle tissue contained 8 to 36 µg/g selenium. Whole-body concentrations of only 4 to 6 µg/g were associated with mortality when juvenile bluegill (*Lepomis macrochirus*) were fed selenomethionine-spiked commercial diets in the laboratory. When bluegill eggs contained 12 to 55 µg/g selenium, transfer of the selenium to developing embryos during yolk-sac absorption resulted in edema, morphological deformities, and death prior to the swim-up stage. In a laboratory study of "winter stress syndrome" juvenile bluegill exposed to a diet containing 5.1 µg/g selenium and water containing 4.8 µg/L (ppb) selenium exhibited hematological changes and gill damage that reduced respiratory capacity while increasing respiratory demand and oxygen consumption. In combination with low water temperature (4 degrees Celsius), these effects caused reduced activity and feeding, depletion of 50 to 80 percent of body lipid, and significant mortality within 60 days. Winter stress syndrome resulted in the death of about one-third of exposed fish at whole body concentrations of 5 to 8 µg/g selenium.

Based on Lemly's review of more than 100 papers, he recommended the following toxic effects thresholds for the overall health and reproductive vigor of freshwater and anadromous fish exposed to elevated concentrations of selenium: 4 µg/g whole body; 8 µg/g skinless fillets; 12 µg/g liver; and 10 µg/g ovary and eggs. He also recommended 3 µg/g as the toxic threshold for selenium in aquatic food-chain organisms consumed by fish. Lemly reported that when waterborne concentrations of inorganic selenium (the predominant form in aquatic environments) are in the 7- to 10-µg/L (ppb) range, bioconcentration factors in phytoplankton are about 3,000. Consequently, he concluded that patterns and magnitudes of bioaccumulation are similar enough among various aquatic systems that a common number, 2 µg/L (ppb; for filtered samples of water), could be given as a threshold for conditions "highly hazardous to the health and long-term survival of fish".

Recently, Hamilton (1998) reviewed the demonstrated and potential effects of selenium on six species of endangered fish in the Colorado River basin, including the humpback chub (*Gila cypha*), Colorado squawfish (*Ptychocheilus lucius*), bonytail chub (*Gila elegans*), razorback sucker, flannelmouth sucker (*Catostomus latipinnis*), and roundtail chub (*Gila robusta*). Hamilton presents historical data supporting a hypothesis that long-term selenium contamination of the lower Colorado River basin may have been one of the factors contributing to the disappearance of endangered fish in the early 1930's. Contemporary issues of concern included the unusually high incidence of abnormal lesions on fish in the San Juan River, especially flannelmouth sucker, attributed to pathogens requiring inducement by stressors such as high contaminant concentrations or poor body condition. Other concerns included concentrations of selenium in fish eggs as high as

28 µg/g in razorback sucker from the Green River and as high as 73 µg/g in eggs of rainbow trout collected from the mainstem Colorado River between Glen Canyon Dam and Lee's Ferry. In controlled studies of larval razorback suckers fed food organisms collected from the wild, Hamilton found 2.3 µg/g or more of selenium in the diet to be sufficient to cause reduced survival. In an enclosure study where razorback suckers were held in selenium-contaminated aquatic environments (Adobe Creek, 9-90 µg/L (ppb) selenium, and North Roadside Pond of Ouray National Wildlife Refuge, 40 µg/L (ppb) selenium) for 9 months, muscle plugs contained 17 and 12 µg/g selenium respectively and eggs contained 44 and 38 µg/g selenium. Finally, Hamilton stressed that consideration of selenium effects was an important component of recovery planning for the Colorado River basin endangered endemics.

Desert Pupfish: Specific data exist to support a conclusion that the desert pupfish would be at risk from chronic selenium concentrations on the order of 5 µg/L (ppb). Setmire and Schroeder (1998) report on a field study of sailfin mollies in the Salton Sea area of California. The mollies were chosen as surrogate species to assess contaminant threats to the co-occurring endangered desert pupfish. Mollies and pupfish were simultaneously collected from one site and found to contain virtually identical whole-body selenium concentrations (Bennett 1997), which verified the utility of mollies as a surrogate indicator of pupfish exposure. During 1994, mollies were collected from 13 agricultural drains. For 10 of the 13 drains, whole-body selenium concentrations were in the range of 3 to 6 µg/g, a level designated by a panel of selenium researchers as "of concern" for warmwater fishes (USDI-BOR 1993, also see Gober 1994, CAST 1994, Ohlendorf 1996). Two of the other three drains that were sampled yielded mollies averaging >6 µg/g, a level designated by the panel of researchers as exceeding the toxic threshold for warmwater fishes. Unfortunately, contemporaneous measures of waterborne selenium in the sampled drains were not obtained for comparison to the mollie tissue data.

An inquiry with California's Colorado River Basin Regional Water Quality Control Board yielded file data on waterborne selenium for one of the 13 drains sampled for mollies in 1994; however the file data is for water samples collected in 1996 (R. Lukens, Regional Water Quality Control Board, pers. comm.). Ten monthly (March to December, 1996) measures of waterborne selenium in the Trifolium 12 drain averaged 4.96 µg/L (ppb). Sailfin mollies collected from Trifolium 12 drain in 1994 averaged 3.6 µg/g whole-body selenium, with a maximum of 3.8 µg/g (n=3). If the concentrations of selenium in the drain were roughly the same in 1994 as in 1996, then a concentration on the order of 5 µg/L (ppb) would be associated with expected pupfish tissue concentrations of selenium at the "level of concern." Borderline exposures for direct toxic effects may be particularly hazardous at the Salton Sea because of the recent record of diverse and frequent epizootic events documented for fish and birds at the Sea. It is well established for birds that selenium-induced immune dysfunction occurs at exposure levels below those required for direct selenium-poisoning. Until comparable studies are completed for fish, the safest assumption is that the results for selenium-induced immune dysfunction documented for birds may also apply to fish.

Harm in the form of reduced reproductive success and increased vulnerability to pathogen challenge (that could result in injury or mortality) could occur depending on the sensitivity of this species to the water conservation-related increases in selenium concentrations. Mortality is

possible for desert pupfish larvae depending on their specific sensitivity and the actual concentrations that result from the water conservation. The average concentrations in the drains that are expected with water conservation (2.2 to 11.7 µg/L) are not anticipated to result in direct mortality in the adult population, although peaks in concentrations, depending on their magnitude and duration, may result in adult mortality. These changes will affect slightly over half (29 of 52) of the agricultural drains that are currently occupied or potential habitat for the desert pupfish. This habitat has been identified as necessary for recovery of the species.

Salinity Effects

The salinity of the Salton Sea is expected to increase more rapidly with the proposed project than under the baseline. Pupfish have a high salinity tolerance, and they have been shown to survive salinities higher than 90 ppt. The Salton Sea Accounting Model (SSAM) predicts that the salinity will exceed 90 ppt after the end of the water transfer term under the baseline. With the proposed project the salinity is expected to exceed 90 ppt in 2027. This is 58 years sooner than under the baseline. The desert pupfish conservation measures call for the creation of connections between the drains to allow for inter-drain movement when the Salton Sea salinity has exceeded the 90 ppt threshold. A lower threshold will be used if new information suggests that it is appropriate. Because these connections will be in place prior to the Salton Sea salinity exceeding 90 ppt (or lower as appropriate), no harm should result from the salinity of the Salton Sea exceeding the 90 ppt threshold. However, these connections will require structural changes in the drain configurations. The construction and maintenance of these connections may result in injury or mortality of desert pupfish. This construction activity in the occupied portions of the drains is expected to require the use of heavy equipment to open the connections between drains, but we anticipate that it will be limited to a single connection of similar width as existing drains that intersects each drain once. The need for maintenance can be managed to some degree by controlling the slope of the connections to minimize sediment build up to the extent that this does not detract from the habitat conditions required by pupfish. Given the average frequency of similar activities in the Imperial Valley and the management opportunity described above, we anticipate that 20% of the connections would require maintenance annually. It is very difficult to survey for this species, so the number of pupfish impacted by this activity cannot be quantified at this time. There are 29 drains at the south end that will require connection (in three groups as the existing river deltas form barriers) and 23 drains at the north end (in two groups again as a result of the existing river delta functioning as a barrier).

Without these connections, pupfish would be isolated within individual drains, and the drains would be subject to random events such as run off of excess fertilizers, low dissolved oxygen events, and pesticide spills that could result in direct mortality of the pupfish within the drains where these events occur. To maintain the drain population, pupfish need to be able to move out of the drains when conditions become inhospitable and to move back into drains and re-establish themselves when conditions return to normal. We anticipate that without these connections, pupfish drain populations would ultimately be lost as such stochastic events eliminate individual drain populations one by one. The loss of these drain populations would limit the ability to recover the species. These connections are expected to provide an overall benefit to drain pupfish populations that should offset any short-term impacts associated with their construction.

Physical Effects

The extension of the drains that occurs unaided as the elevation of the Salton Sea declines may not allow for pupfish movement below the existing occupied areas depending on the configuration formed as a result of the flow and gradient. The Salton Sea bathymetry is currently not adequately mapped to determine if subsurface physical barriers are present between drains that will interfere with pupfish movement as the elevation of the Salton Sea declines with the proposed project. The removal of such physical barriers is anticipated to require minor construction along the lengths of the drains and shoreline of the Salton Sea. Because the disturbance associated with this construction is anticipated to be less than that associated with construction of the inter-drain connections, it is likely that harm of desert pupfish will be minimal as a result of this activity. As stated previously, this species is very difficult to survey so the number of individuals affected cannot be quantified at this time.

The pupfish refugium established as part of Pupfish Conservation Measure 1 will require regular maintenance to control vegetative growth and maintain the appropriate habitat conditions for desert pupfish. It is anticipated that this will result in harm in the form of temporary disturbance of the habitat. Use of heavy equipment could result in mortality of some fish. As described above for other construction activities, it is not possible to quantify this harm in terms of numbers of fish impacted. Overall, the maintenance will benefit the pupfish by maintaining the appropriate habitat conditions so the impacts associated with this activity should be offset by the benefits.

Monitoring activities necessary to implement the pupfish conservation measures will require capture of the pupfish using minnow traps. As part of the desert pupfish conservation measures, the Bureau will be developing a more consistent method to census this species. However, we still anticipate that some form of capture will be required for these surveys. In some limited cases there may be mortality associated with the current procedure as a result of unanticipated changes in water quality conditions. In most cases the pupfish are expected to be released without harm. It is hoped that the new procedure will reduce or eliminate the potential for such losses.

As part of the conservation measures for desert pupfish, selenium management measures (e.g., splitting combined drain flows and managed marsh outfall pipes) may have to be constructed to reduce selenium concentrations in some or all of the pupfish drains. These structures are not expected to require major modifications of the entire surface drain, but some construction will be required at the connection points. Some pupfish may be harmed or killed during this construction, but the extent should be limited because the fish will have the ability to seek shelter in unaffected portions of the drains. The long-term benefits of reducing the selenium concentrations should offset any short-term losses that occur.

Desert Pupfish Summary

Given the current state of our knowledge, our greatest concern for the pupfish is associated with the increases in selenium concentrations anticipated with water conservation. While not part of designated critical habitat, the drain pupfish populations have been identified in the Recovery Plan as necessary for long-term survival and recovery. Therefore, no critical habitat would be adversely

modified as a result of the proposed fish and wildlife conservation measures or water conservation activities, but recovery could be precluded without the ability to identify and respond to increases in selenium concentrations that have the potential to impact reproduction or survival (via reduced ability to respond to pathogen challenge) in time to prevent the loss of this population. We are currently conducting studies on selenium toxicity to desert pupfish. Reclamation and/or its conservation agreement partners will be providing the necessary funding to complete those studies in a timely fashion (5-7 years). Concurrently, Reclamation and its conservation partners will be conducting baseline surveys of the selenium concentrations in the potential pupfish drains and carrying out pupfish surveys (using the existing protocol as an interim measure). Therefore, considerably greater information should be available prior to the conversion from the fallowing associated with the 15-year minimization of project impacts, thus providing a more certain context in which to evaluate the baseline selenium concentrations and those that result from the implementation of on-farm and system water conservation. Specific trigger concentrations will be identified that when exceeded will result in the implementation of selenium control measures. It should be possible to identify the need for management action for selenium in advance of severe impacts by providing a thorough long-term monitoring program that closely tracks the selenium concentrations of the matrix or matrices being evaluated for these triggers. Because Reclamation has committed to providing for such a monitoring program that meets the approval of the Service and CDFG and to taking the appropriate management action in response to unacceptable selenium concentrations, we do not anticipate that this project will preclude the survival and recovery of the desert pupfish.

Because of the limited areal extent of disturbance associated with the construction of connections, removal of physical barriers, and construction of selenium management measures, these activities are not anticipated to preclude the continued existence of the desert pupfish. This conclusion is supported by the fact that desert pupfish have coexisted with a variety of agricultural activities since the drains were created, including a regular schedule of maintenance dredging.

No activities are planned within the area that has been designated as critical habitat for this species. Critical habitat has been designated within the San Felipe Creek watershed (San Felipe and Fish Creeks) upstream of the Salton Sea.

Yuma Clapper Rail

The Yuma clapper rail is known to use drain habitat with the appropriate vegetative cover in the Imperial Valley, and it will be affected by water conservation-related changes within the drains. These changes fall into two basic types: loss/degradation of vegetation as a result of increases in salinity of the drain flows and impacts to Yuma clapper rail reproduction resulting from increases in drain water selenium concentrations. Impacts to drain vegetation are not anticipated as a result of changes in drain flows of between 9 and 28 percent relative to current conditions (depending on the amount of water conserved through fallowing). Changes in flow in drains would be manifested as a total reduction in flow volume, with potentially shorter durations of peak flows and reduced frequency of peak flows. Periods of dryness likely would increase in frequency and duration, and potentially a greater number of drains would be dry at any given time. Nevertheless, the level of potential flow reduction in the drains is within the historic range of drain flows.

Salinity Effects

Agricultural drains support limited use by clapper rails. High-quality habitat for Yuma clapper rails consists of mature stands of dense or moderately dense cattails intersected by water channels. Clapper rails breed, forage, and find cover in this type of habitat. Clapper rails have also been reported using areas of common reed, although nesting is uncertain and density is lower than in cattail marshes. The IID drainage system is estimated to contain about 63 acres of cattails. Common reed, tamarisk, and arrowweed are the predominant species of the remaining 589 acres of vegetation estimated in the drainage system. The vegetation characteristics of the drains suggest the drains provide poor quality habitat for clapper rails. Home range sizes vary greatly; values of 0.3 to 27.4 acres/rail have been reported. However, in most cases the drains are unlikely to support a block of vegetation this size, which further suggests that habitat in the drains is of limited quality to clapper rails. Breeding has not been verified in the drains, but clapper rails have been documented in surveys of drains during the breeding season, suggesting that some breeding is occurring in drain habitats.

Much of the vegetation in the drainage system is tamarisk and common reed. These species are tolerant of a wide range of conditions. As such, they would adjust to flow changes in the drains, and their occurrence and distribution would not change substantially. Cattails and other wetland plants used as habitat by clapper rails are limited. Cattails are concentrated in the bottoms of drains. Because of the steep drain sides, little difference in water depths would occur with lower flow volumes. If drains were drier for longer periods of time, minor, temporary changes in the extent of cattails would potentially occur. Although such changes could not be quantified based on the hydrology model, they are believed to be small.

By increasing the ratio of tilewater to tailwater in the drains, the IID water conservation activities would increase salinity in the drains. Cattails are sensitive to salinity levels. Growth is best when water salinity is less than 3 g/L (3,000 ppm). Salinity levels of 3 to 5 g/L stunt the growth of cattails. Above 5 g/L (5,000 ppm), growth and survival of cattails are limited. The total amount of cattail vegetation estimated to be in the drains (63 acres) could potentially be reduced, as could the amount with good growing conditions. With conservation of 300 KAFY through on-farm and system-based measures, the acreage of cattails supported in the drains would potentially be reduced by 4 acres. An additional 23 acres of remaining cattail vegetation would be subjected to increased salinity levels that could stunt growth and reduce vigor of the plant. If all fallowing is used to conserve water, there would be no change in drain salinity and, therefore, no impacts to cattail vegetation. Use of fallowing to conserve a portion of the 300 KAFY would result in intermediate impacts. The loss or stunting of cattail vegetation in the drains constitutes a potentially adverse impact of IID's water conservation activities on Yuma clapper rails.

As part of its proposed rail conservation measures, Reclamation and/or its conservation agreement partners will create 31 acres of high quality managed marsh habitat (Rail Conservation Measure 1). The created habitat will be of substantially better quality for Yuma clapper rails than drain habitat because it will contain preferred plant species (i.e., cattails and bulrush), have better water quality, and be configured to provide an appropriate mix of dense vegetation interspersed with open water. While rails tend not to move during the breeding season once established unless forced to by

changing conditions (Bennett and Ohmart 1978), movements by unpaired males during the breeding season and by adults and juveniles during the non-breeding season allow birds to find new habitats (Eddleman and Conway 1998). The created habitat is anticipated to be managed in a similar manner as emergent freshwater marsh units are managed on the refuges and thus be attractive to clapper rails. With the overall increase in quantity and quality of clapper rail habitat in their U.S. range, the Service does not anticipate harm as a result of this potential impact. It is not necessary that the managed marsh be located in the Imperial Valley provided that the marsh is located in proximity to existing occupied habitat. The Service and CDFG will be consulted in locating the managed marsh.

Selenium Effects

Clapper rails also could be impacted through exposure to slightly higher concentrations of selenium in the drains as a result of IID's conservation actions. Following the methods described in the Draft HCP for IID's proposed water conservation and transfer program (Appendix C of the EIR/EIS [CH2MHill 2002]), potential impacts of increased selenium concentrations in the drains on clapper rail egg hatchability are predicted for IID's actions. Under current conditions, selenium concentrations result in hatchability impacts in approximately 3 percent of Yuma clapper rail clutches. As a result of IID's water conservation activities, hatchability impacts due to selenium could affect up to 6 percent of Yuma clapper rail clutches, comprising a 3 percent increase above current conditions.

Under the proposed Conservation Plan, Reclamation and/or its conservation agreement partners will create an additional 42 acres of high quality managed marsh to offset the impacts of increased selenium concentrations on clapper rail egg hatchability (Clapper Rail Conservation Measure 2). This acreage of managed marsh is in addition to the 31 acres created under Clapper Rail Conservation Measure 1 and would be phased in over 10 years. The selenium concentration of water used to support the managed marsh is expected to be close to 2 ppb. This selenium concentration is considerably lower than the selenium concentration in most drains in the IID water service area. Adverse impacts from selenium toxicity would be avoided in the managed marsh, and the quality of the managed marsh habitat would be further enhanced beyond that in the drains by design. While we still anticipate impacts to occur as a result of clapper rails foraging in the drains, such impacts would be limited. Given the maximum possible count of potentially breeding rails in drains was found to be on the order of 8 pairs (Holtville Main, Trifolium 1, and Bruchard combined), the increase in egg hatchability impacts is expected to affect at most a single Yuma clapper rail clutch. The additional acreage being created to offset this effect (42 acres) could accommodate 2 or 3 pairs. Because we expect the water quality in the created habitat to be better than what is in the drains, we expect a net increase in reproduction relative to the selenium-related impact.

Physical Effects

One additional potential source of habitat loss is the construction of lateral interceptors. Given that the entire drainage system has an estimated 63 acres of cattails and the lateral interceptor connections with any individual drain will be similar to the width of the drain itself, it is unlikely

that this construction activity will remove a measurable amount of cattail vegetation. Even if this were to occur, the impact would only be temporary. Cattails would be expected to return to the area as the conditions stabilized.

We anticipate some impacts associated with the rail conservation measures themselves. The clapper rails that come to occupy the marsh may be harmed during the protocol surveys required for monitoring. The use of taped vocalizations can result in the adults moving off the nest and exposing the eggs or chicks to predation or the elements thus resulting in the potential loss of those eggs or chicks. Some clapper rails could also be harmed as a result of the need to carry out management actions (e.g., burning) to maintain the long-term health of the 73 acres of managed marsh. Such disturbances will be temporary, infrequent (approximately every third or fourth year), and will result in an overall increase in habitat quality.

Yuma Clapper Rail Summary

The minor loss of Yuma clapper rail reproduction, potential harm associated with surveys, and potential harm associated with marsh management are not likely to preclude the survival and recovery of this subspecies when considered in the context that the majority of the population in the Imperial Valley is found on State and Federal wildlife refuges where habitat is managed specifically for Yuma clapper rails.

California Black Rail

The California black rail may use drain habitat with the appropriate vegetative cover and physical characteristics in the Imperial Valley (although such use has not been documented), and it may be affected by water conservation-related changes within the drains. Overall, drains do not support high-quality California black rail habitat. High-quality habitat for black rails consists of mature stands of dense emergent vegetation (particularly bulrush) with very shallow water levels and gently sloping shorelines. Black rails breed, forage, and find cover in this type of habitat. Black rails have also been reported using areas with cattails where water depths are adequately shallow. The IID drainage system is estimated to contain about 63 acres of cattails. Common reed, tamarisk, and arrowweed are the predominant species of the remaining 589 acres of vegetation estimated in the drainage system. The vegetation characteristics of the drains suggest the drains provide poor quality habitat for black rails. Telemetry studies at Mittry Lake found black rails to be sedentary, with home ranges averaging 1.2 acres or less (Flores and Eddleman 1991). The drains are unlikely to support a block of vegetation this size given their linear configuration, and the shape of the drain prism (steep sides and narrow bottom) is not conducive to black rail use. This suggests that habitat in the drains is of limited quality to black rails. Breeding by California black rails has not been verified in the drains.

The impacts that may occur to California black rails are very similar to those described above for the Yuma clapper rail. The changes that may affect them include increases in salinity and selenium concentrations as described above. Because the physical structure of the drains is even less likely to support use by black rails, we would expect even fewer pairs of this species to be affected. The additional acreage being created to offset these effects (73 acres) could include the appropriate

habitat characteristics to accommodate several pairs of black rails. Because we expect the water quality in the created habitat to be better than what is in the drains, we expect a net increase in reproduction relative to the salinity- and selenium-related impacts.

One additional potential source of habitat loss is the construction of lateral interceptors. Given that the entire drainage system has an estimated 63 acres of cattails and the use of the drains by black rails is expected to be very low, it is unlikely that this construction activity will remove a measurable amount of black rail habitat. Even if this were to occur, the impact would only be temporary. Emergent vegetation would be expected to return to the area as the conditions stabilized.

We anticipate some impacts associated with the rail conservation measures themselves. The black rails that come to occupy the marsh may be harmed during the protocol surveys required for monitoring. The use of taped vocalizations can result in the adults moving off the nest and exposing the eggs or chicks to predation or the elements thus resulting in the potential loss of those eggs or chicks. Some black rails could also be harmed as a result of the need to carry out management actions (e.g., burning) to maintain the long-term health of the 73 acres of managed marsh. Such disturbances will be temporary, infrequent (approximately every third or fourth year), and will result in an overall increase in habitat quality.

The minor potential loss of California black rail reproduction, harassment associated with surveys, and potential harm associated with marsh management, are not likely to affect the long-term status of the species, considering the small proportion of the species' rangewide population occurring in the drains at issue, as well as the minor and temporary disturbance anticipated in these habitats.

California Brown Pelican

The California brown pelican is present at the Salton Sea year-round. Peak numbers of this species are present during the summer months when large numbers of mostly juvenile birds come to the region as a result of dispersal from breeding colonies in Mexico. They will be impacted by the water conservation-related changes in salinity in the Salton Sea that reduce extensively the availability of fish in the Sea. For a smaller number of birds for which a forage base will remain, the impact will be in the loss of roost sites as the elevation decreases as a result of water conservation.

A small data set was available from the Sonny Bono Salton Sea NWR that included monthly counts of pelicans for the period of December 1999 through August 2001. The peak counts during that time occurred in June of 2000 and July of 2001 with an average for those peaks of 3,295 birds. This figure was then used in a Resource Equivalency Analysis (REA; NOAA 1995) to quantify the loss in bird use. Some assumptions were used in conducting this analysis. In consideration of the fact that tilapia are the predominant species of fish in the Sea (Costa-Pierce and Riedel 2000), their behavior makes them available to foraging pelicans (Glenn Black, CDFG, pers. comm.), and tilapia are believed to be the dominant fish in the pelicans' diet at the Salton Sea (Ken Sturm, Sonny Bono Salton Sea NWR, pers. comm.), we are making an assumption regarding loss of pelicans at the Sea relative to the estimated salinity threshold of this fish species. The decrease in pelican numbers is expected to occur more slowly at lower end of the salinity spectrum than at the higher end because

the tilapia is not expected to be affected, whereas the other fish species (orange-mouth corvina (*Cynoscion xanthulus*), Gulf croaker (*Bairdiella icistia*), and sargo (*Anisotremus davidsoni*)) that make up a small proportion of the diet are expected to be impacted at lower salinities. In the interval between 50 and 60 ppt, we assumed a loss of 10 percent of the pelicans currently using the Salton Sea. A 90 percent decrease was anticipated during the 60 and 65 ppt interval when impacts to tilapia are expected. We assumed a small population (25 birds) would remain at the Salton Sea as a result of the long-term availability of a small forage base at the river deltas and drains. A schedule of pelican numbers was developed with the water conservation activities and the minimization (15-year plan) and without the water conservation activities (baseline). The REA comparison yielded a figure for lost pelican-use years throughout the 45 years of the first term of the water transfer (12,383 lost pelican-use years). Because the fish population is expected to be limited to the river and drain mouths throughout the second term of the transfer, no additional impacts are anticipated from 2049 through 2078.

The restoration requirement is also based on the REA. After we determined the loss, we ran the credit calculation to determine an annual requirement for the operational period of the mitigation. In making this determination some parameters were set in advance. For the mitigation to offset the loss, it was determined that the structures should be in place in the year the 15 year minimization plan for the Salton Sea ends. Based on that start date and the length of the permit term, the REA was used to determine the annual requirement for that term needed to meet the CDFG fully mitigated standard. It was determined that full mitigation requirements would be achieved by providing for 1,200 pelicans with roost projects on the southern California coast.

A list of potential enhancement projects for brown pelicans was then developed that provided priorities based on the identified gaps in roost availability. The purpose of these concepts was to identify projects that could provide for a combination of roosts in the vicinity of foraging areas for 1,200 brown pelicans to offset the loss of such habitat at the Salton Sea. The outer Santa Barbara Harbor and San Diego Bay were identified as the top priority sites. The Santa Barbara Harbor site would replace a barge that as a result of very limited roost options in the area had a high level of documented use when it was temporarily moored in that area (Strong 2002a and 2002b). San Diego Bay has also been identified as a high priority site due to limited roost resources along the San Diego County coast (Strong 2002a, 2002b). San Diego Bay has a known forage base (Allen 1999) and offers protected waters that would provide for good roost opportunities with the addition of appropriate structures. These two sites will be required to meet the CDFG fully mitigated standard and are to be in place and functioning by 2018 (when the impacts beyond baseline changes begin), with other sites added as needed to achieve that mitigation requirement. Each site will need to demonstrate success as a roost through documented use by a minimum of 100 birds during three of the five initial years of surveys (to begin one year after implementation and occur monthly from June through October including day and night use). Credit toward the CDFG fully mitigated standard is additive between the two sites and will be determined based on peak use of the sites during those initial surveys. If full mitigation is not achieved with the first two projects, additional projects will be required. These additional projects should be implemented in a timely fashion such that they are in place by 2023. This deadline will be reconsidered by the Service and CDFG if the numbers of brown pelicans still using the Salton Sea are significantly higher than predicted.

Reclamation and/or its conservation agreement partners will provide for the placement of roosts adequate for use by 2,000 pelicans, with a minimum use requirement of 1,200 pelicans. The specific details regarding number, sizes, and locations of the roost structures will be determined based on the specific constraints of each site and on permit requirements of other agencies with jurisdiction over placement of the structures. Reclamation and/or its conservation agreement partners will provide adequate funds to support the management and monitoring of the roost structures annually throughout the water transfer term. There could be disruptions of pelican use in the future to carry out needed maintenance/replacement of the roost structures, which could result in temporary abandonment by those birds that otherwise would have used them. Such maintenance is anticipated to be required less than annually, with closure to last no more than three weeks. Any harm resulting from the increased energy requirements associated with longer travel between roosting and foraging areas that occurs during this activity is considered minor in comparison to the benefits accrued over the first project term.

Because the water conservation activities as described would maintain the salinity trajectory at essentially the baseline projection for the first 15 years, only minor impacts are anticipated to occur beyond any changes associated with the baseline conditions (i.e., loss of near shore roost sites associated with the baseline change in elevation). Some harm to brown pelicans resulting from the loss of roosts could occur as a result of the elevation difference of 0.6 feet between the water conservation activities and the baseline during the first 15 years, although we anticipate this to be small. Starting in the sixteenth year of the program, the salinity will increase and the bird numbers will decrease rapidly as compared to the baseline projection. The total loss of pelican use has been quantified at 12,383 pelican-use years. Because many of the post-breeding juveniles dispersing to the Salton Sea arrive in poor condition (Charlie Pelizza, Sonny Bono Salton Sea NWR, pers. comm. 2002), it is likely that at least a portion of these birds will not have adequate reserves to move to other foraging areas once the Salton Sea is no longer supporting an adequate fish population and would die as a result. The other pelicans that are not able to find adequate forage at the Salton Sea but are capable of moving on to other areas may be harmed by the lack of foraging opportunities and the depletion of energy reserves required for this additional migratory step. While this is expected to occur without the water conservation activities, the pace of the transition is faster with those activities.

The CDFG-required mitigation actions taken on the California coast should help offset these impacts. By providing roosts in proximity to existing forage fish resources, pelicans dispersing to the California coast during the non-breeding season will find additional roosts that will reduce their energetic requirements in moving from foraging to roosting areas. The increase in numbers of pelicans along the California coast during the non-breeding season is believed to result from dispersal of birds from Mexico, including some birds from the Gulf of California (USFWS 1983). Therefore, we anticipate that the Gulf of California breeding population that is believed to be the primary source of birds dispersing to the Salton Sea will benefit from the proposed brown pelican conservation measure.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological/conference opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Several projects are planned in the action area that may affect listed species in the Imperial Valley and/or Salton Sea. However, a number of these projects require action on the part of a Federal agency, and thus would require independent review under section 7 of the ESA. Therefore, the impacts of such Federal projects are not considered to be cumulative to the effects. Reclamation is the Federal lead agency on the Salton Sea Restoration Project, and the Service anticipates continuing to work with Reclamation to maximize the benefits and minimize the impacts associated with that project. The Inadvertent Overrun and Payback Policy is related to the QSA and will be overseen by Reclamation. The Colorado River Salinity Control Program is jointly funded by Reclamation, the Bureau of Land Management and the Department of Agriculture. This program provides for a variety of projects that maintain the salinity of the Colorado River below the designated thresholds. This is a factor in the overall salt loading to the Salton Sea. The Environmental Protection Agency is providing assistance (financial and technical) with the Mexicali Wastewater System Improvement Projects. Reclamation is the Federal lead agency on the Brawley wetlands demonstration project, and the Service intends to continue working with Reclamation to maximize the benefits and minimize the impacts associated with that project as it expands into other areas of the Imperial Valley. Several other projects on the southern California coast may benefit or impact California brown pelicans. These projects require Federal funding or approval and thus will require review under section 7 of the ESA. No cumulative effects were identified for the lower Colorado River, as projects occurring there that could impact federally listed species would involve modifications of wetlands and/or river operations, thus falling under Federal jurisdiction and requiring review under section 7.

Coachella Valley Water Management Plan

CVWD prepared the Coachella Valley Water Management Plan to provide an overall program for managing its surface and groundwater resources in the future. The objectives of this water management plan are to:

- Eliminate groundwater overdraft and its associated adverse impacts, including groundwater storage reduction, declining groundwater levels, land subsidence, and water quality degradation
- Maximize conjunctive use opportunities
- Minimize adverse economic impacts to Coachella Valley water users
- Minimize environmental impacts

The overall water management plan involves a number of actions to reduce the current overdraft of groundwater in the Coachella Valley through increased use of Colorado River water (reducing demand for groundwater pumping) and various recycling and water conservation activities to reuse

or decrease the consumption of water. A substantial portion of the additional Colorado River water to be used pursuant to the water management plan (up to 100 KAFY) is the conserved water to be transferred by IID to CVWD under the QSA. Other elements of this plan are not dependent on implementation of the QSA.

Some activities associated with the receipt and use of water under the QSA may result in changes in the flows or selenium concentrations of the agricultural drains within the CVWD. Increased flows and/or selenium concentrations may impact the habitat values associated with the drain extensions/connections created to minimize the impacts of water conservation. These changes may, in turn, result in impacts to listed species such as the desert pupfish and Yuma clapper rail. The desert pupfish may be subject to greater competition or predation from exotic species as a result of increased flows in the CVWD drains. Both the desert pupfish and the Yuma clapper rail may be impacted by increased selenium concentrations. However, the Service and CDFG are currently working with CVWD on components of a HCP that will either be incorporated into the Coachella Valley Multi-Species Habitat Conservation Plan or become a stand-alone HCP for Improvement District 1 (the area that can receive the conserved water from IID). We currently anticipate that the impacts associated with the receipt and use of the conserved water will be addressed in one of these two ways. We should have the results of the toxicity testing before measurable changes in selenium occur because the ramp-up rate for the transfer to CVWD is relatively slow and does not begin until 2008. Therefore, we do not anticipate unmitigated cumulative impacts to desert pupfish and Yuma clapper rails that use the drains as a result of the CVWD's receipt and use of water under the QSA. In addition, the connections created as part of this project may be designed to ameliorate some of the effects of increased flow if that is identified as a need at the time of implementation of Pupfish Conservation Measure 1.

Should CVWD not move forward with their HCP as planned, impacts could occur to the desert pupfish and Yuma clapper rail. Desert pupfish could be impacted by the increases in flows, which potentially favor exotic fish species that are competitors with or predators of desert pupfish. This is potentially the primary factor impacting the desert pupfish in the drains. The drains in the CVWD area that flow directly to the Salton Sea account for almost half of this drain habitat for the pupfish (23 of 52 total). Long-term occupation of these drains has been identified as necessary for the recovery of this species. The unmitigated effect of these changes could be significant. Rails could be impacted by potential increases in maintenance necessitated by the increased flows. Direct loss of eggs and chicks could occur if maintenance were to be carried out during the breeding season. However, these drains do not provide for a large proportion of the Yuma clapper rail population in the Salton Trough. Increased selenium concentrations resulting from the increased use of Colorado River water in the Coachella Valley could have the same effects as those described above for the water conservation activities on desert pupfish and rails.

Use of this water may change the salt balance within the Salton Sea as a result of the increase salt load in agricultural drain water from the Coachella Valley. This could impact the ability of the California brown pelican to continue foraging at the Salton Sea. However, this change was considered in the development of the 15-year minimization of impacts to the Salton Sea described above. As a result, the salinity will not materially deviate from that predicted for the baseline. The

desert pupfish will not be impacted as its connectivity requirements are being addressed through the desert pupfish conservation measures proposed as part of Reclamation's project.

MWD/CVWD State Water Project Water Transfer and Exchange

This project involves the exchange between MWD and CVWD of State Water Project water entitlements and Colorado River water. CVWD would transfer 35,000 AF of its State entitlement to MWD, and in exchange MWD would arrange for the delivery of 35,000 AF of Colorado River water to CVWD. Delivery may be made via the Colorado River aqueduct or the Coachella Canal. As this is simply an exchange of water with no changes in volume and only minor changes in salinity of CVWD's drain water and the Salton Sea, we do not anticipate any measurable changes in the habitat values for listed species.

Cabazon Power Plant

This project involves the construction of a 500-Megawatt natural gas-fired power generation facility on the Cabazon Indian Reservation in the Coachella Valley. The current plans call for the use of 5,000 AF of water from the Coachella Canal annually. This water would be used largely for cooling water and would be discharged to the Coachella Valley Storm Channel (Whitewater River). Currently, very few details are available about this project. Depending on the salinity of the discharge, it may function to increase or decrease the salinity of the Salton Sea. We do not believe there are adequate details to have considered this project in the development of the 15-year minimization plan, but the volume of water involved is relatively low. It is unlikely that this would cause a measurable increase in the salinity of the Salton Sea, and the discharge may function as dilution water if the salinity is below that of the Sea. No measurable cumulative effects to the California brown pelican are anticipated as a result of this project. The desert pupfish will not be impacted as its connectivity requirements are being addressed through the desert pupfish conservation measures proposed as part of Reclamation's project.

North Baja Powerline

The North Baja Powerline is a 6-mile powerline project in the southwest portion of the IID service area. The construction and maintenance of the powerline may result in the loss of riparian, wetland, and agricultural field habitats that may contribute to the impacts associated with the loss of these habitats from the proposed fish and wildlife conservation measures and interrelated effects of water conservation activities under consultation. However, because of the linear nature of the powerline project, habitat losses are not anticipated to occur in large blocks. The proposed fish and wildlife conservation measures and the interrelated effects of the water conservation activities under consultation includes replacement of lost habitat adequate to offset the impacts to the Yuma clapper rail and California black rail such that there would not be cumulative effects in combination with the North Baja Powerline.

Heber Wastewater Treatment System Project

This wastewater treatment plant serves the community of Heber, which is located approximately 5 miles north of the Mexican border in the Imperial Valley. The plant discharges to an agricultural drain that is a tributary to the Alamo River. The expansion of the plant would increase the discharge from 0.402 to 0.810 million gallons/day. At full capacity, the discharge from the plant would increase the inflows to the Salton Sea by 457 AFY. While this is a beneficial effect, it may not result in a measurable change in the salinity of the Salton Sea. There would be no cumulative effects to the California brown pelican or the desert pupfish as a result of this project.

Colorado River Basin Regional Water Quality Control Board's Watershed Management Initiative

The Watershed Management Initiative is the Colorado River Basin Regional Water Quality Control Board's (Regional Board) internal planning document for the Salton Sea Transboundary Planning unit. This watershed is the priority watershed within the Region. The watershed has been determined to be impaired, and this plan provides the guidance to addressing these impairments. The implementation of this plan should improve the water quality within the watershed and thus benefit a variety of species. Specific actions within the plan include the Total Maximum Daily Load Program discussed below.

Total Maximum Daily Load Program

Pursuant to the requirements of the Clean Water Act, the Regional Board has identified and ranked "impaired water bodies" within their Region for which Total Maximum Daily Loads (TMDLs) need to be established. The Regional Board will develop and adopt a TMDL for each combination of an impaired water body and a constituent of concern and will develop the necessary implementing actions to achieve the TMDL. The TMDL is anticipated to result in improved water quality in the drains, rivers and Salton Sea, thus benefitting a variety of species. While some measures to control constituents of concern may result in reduced drain flows and ultimately reduced inflows to the Salton Sea, many of these types of measures would also function to conserve water and therefore would not be expected to be additive to the proposed fish and wildlife conservation measures and the interrelated effects of the water conservation activities under consultation. In most cases we anticipate that the majority of measures will involve Best Management Practices that do not reduce the inflows substantially. Therefore, we do not anticipate measurable cumulative effects to the California brown pelican or the desert pupfish.

Coachella Valley/Salton Sea Non-Point Origin Source Project

The Coachella Valley Storm Channel carries agricultural drain water, treated municipal effluent, and runoff into the Salton Sea. The Coachella Valley/Salton Sea Non-Point Origin Source Project seeks to address non-point source pollution entering the Salton Sea and the Coachella Valley Storm Channel. The lead agency for that project is the Torres-Martinez Band of Desert Cahuilla. That effort includes groundwater protection, wetland treatment cells for agricultural drain water, Best Management Practices for controlling non-point source pollution, and raising public awareness and

participation in pollution prevention. The wetlands would reduce the movement of nutrients into the Salton Sea, particularly nitrogen. Phosphorus, however, is considered the limiting nutrient in the Salton Sea system so reductions in eutrophication of the Salton Sea at this scale are not expected to be measurable. The wetlands will also increase evapotranspiration of the water, thus reducing slightly the volume of flow in the Coachella Valley Storm Channel. Because these wetlands are small and would have only a minor impact on the inflows to the Salton Sea, measurable cumulative impacts to listed species are not anticipated as a result of this project.

Allegretti Farms Increased Groundwater Pumping in the San Felipe Creek Watershed

Allegretti Farms was recently granted a conditional use permit by Imperial County to increase groundwater production for agricultural use from12,000 acre-feet/year to up to 27,000 acre feet/year (10 acre-feet/acre of farmable land). The project proponent provided a hydrological study in support of their application that concluded that the deep aquifer being tapped for their agricultural operation was separate from the shallow aquifer that supplies perennial flows to San Felipe and Fish Creeks. The report went on to conclude that the run-off from the agriculture may in fact contribute to the shallow spring flow supporting the pupfish habitat. This hydrology report has not undergone independent review, but it does suggest that the desert pupfish and its designated critical habitat would not be impacted by the increase in groundwater pumping. Only continued monitoring of the habitat will provide the necessary information to confirm or refute the conclusions of the hydrological study. The cumulative effect of this activity on the desert pupfish cannot be determined at this time.

CONCLUSION

After reviewing the current status of the species, the environmental baseline from the action area, the effects of implementation of all of the proposed fish and wildlife conservation measures concurrent with the interrelated effects of the water conservation activities, and the cumulative effects, it is the Service's biological opinion that the implementation of the proposed fish and wildlife conservation measures concurrent with the interrelated effects of the water conservation activities is not likely to jeopardize the continued existence of the desert pupfish, Yuma clapper rail, and California brown pelican. The proposed voluntary fish and wildlife conservation measures, as a package, adequately avoid and/or minimize impacts such that survival and recovery of these species are not precluded. The proposed fish and wildlife conservation measures and interrelated water conservation activities are not likely to destroy or adversely modify critical habitat for the desert pupfish, as designated areas only occur outside the action area.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4 (d) of the ESA prohibit the take of endangered or threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as

intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, rather than the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and 7(o)(2) of the ESA, taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with this Incidental Take Statement.

In conducting our analysis we have assumed that all of the voluntary fish and wildlife conservation measures and interrelated water conservation activities will be implemented as described in the project description. The take described below is that which is anticipated with all of the voluntary fish and wildlife conservation measures in place concurrent with the implementation of the water conservation activities. If any of the fish and wildlife conservation measures or water conservation activities are not implemented as described in the project description, our analysis of effects would require modification through re-initiation of the consultation to address changes not contemplated in this opinion.

The measures described below are nondiscretionary, and must be undertaken by Reclamation or made a binding condition of any grant, agreement or permit, as appropriate, for the exemption in section 7(o)(2) to apply. Reclamation has a continuing duty to oversee the activity covered by this incidental take statement. The Service acknowledges that these are voluntary fish and wildlife conservation measures. However, if Reclamation and/or its conservation agreement partners fail to implement the proposed fish and wildlife conservation measures as described above and/or fail to adhere to the terms and conditions of this incidental take statement, the protective coverage of 7(o)(2) may lapse. This exemption does not take effect until the conservation agreement(s) between Reclamation and its conservation agreement partner(s) has/have been executed. To monitor the impact of the incidental take, Reclamation and/or its conservation agreement partners must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR §402.14(i)(3)]

AMOUNT OR EXTENT OF TAKE ANTICIPATED

Desert Pupfish

The Service anticipates that the take of this species will be difficult to detect because of its small size, the inability to detect dead specimens as a result of that size and the nature of the activities that may result in take, the inconsistency of capture associated with the current survey methodology, and other variables that may result in mortality of this species (e.g., fertilizer run off causing drops in dissolved oxygen and spills of toxic pesticides). However, the following forms of take can be anticipated as a result of the proposed fish and wildlife conservation measures and associated water conservation activities.

Harm may occur in all 29 IID drains potentially occupied by desert pupfish as a result of reductions in flow associated with water conservation activities that reduce the areal extent of existing pupfish habitat. Take may occur as a result of increased selenium concentrations associated with water

conservation activities in the 29 IID potential pupfish drains that cause reduced viability of eggs or mortality of larval pupfish. Harm or indirect mortality of adult pupfish may occur through increased vulnerability to pathogen challenge resulting from the increased selenium concentrations in the drains. Direct take of adults as a result of selenium concentration increases is possible, but it is not as likely as mortality resulting from multiple stressor effects.

The construction and maintenance of connections among IID pupfish drains at the south end of the Salton Sea and among CVWD pupfish drains at the north end of the sea and the removal of physical barriers between these drains may result in injury or mortality of pupfish in the area undergoing these activities. For the reasons described above, it is not possible to quantify this take. With the exception of maintenance of the connections once created, these activities are only anticipated to disturb the connection points with the drains, not lengths of occupied habitat within the drains. Once in place, however, the connections may require periodic removal of sediment along their lengths to maintain appropriate habitat conditions. We anticipate that this take will occur within 20 percent of the drain connection system annually.

Adaptive management measures for selenium in the 29 IID drains may result in injury or mortality of pupfish in the area undergoing these activities. For the reasons described above, it is not possible to quantify this take. Should this include the splitting of drain flows or similar measures, the new drain channels may require periodic removal of sediment along their lengths to maintain appropriate habitat conditions. We anticipate that this take will occur within 20 percent of these adaptive management measures annually.

The pupfish refugium will require regular maintenance to control vegetative growth and maintain the appropriate habitat conditions. It is anticipated that this will result in harm in the form of temporary disturbance of the habitat. Use of heavy equipment could result in mortality of some fish. For the reasons described above, it is not possible to quantify this take in terms of numbers of fish impacted.

Monitoring is required to determine the need for selenium minimization measures and to document the success of the minimization measures once implemented through Reclamation's proposed fish and wildlife conservation program. In the case of the desert pupfish, this involves its capture. In rare instances, water quality conditions may change while pupfish are in the minnow traps such that mortality events may occur. Reclamation and its conservation agreement partners have agreed to develop more accurate survey methods that should take into consideration these potential problems, thus reducing or eliminating the mortality potentially associated with pupfish surveys. We anticipate capture of pupfish within all portions of the existing pupfish drains, future connections, and the pupfish refugium to be created as part of the proposal. During the interim period while a new protocol is being developed, we anticipate one mortality event annually (i.e., one trap found with dead pupfish) as a result of changed water quality conditions while the traps are set. While we cannot predict at this time how much a new protocol would reduce this mortality, we do not anticipate that it would exceed this amount (i.e., one trap found with dead pupfish annually).

Yuma Clapper Rail

The Service anticipates that 1 Yuma clapper rail clutch could be lost annually as a result of selenium concentration increases in the IID drains associated with water conservation. All of the Yuma clapper rails that come to occupy the 73 acres of marsh created to minimize the impacts of the water conservation activities may be harmed as described in the effects analysis as a result of the need to conduct protocol surveys that require the playing of taped vocalizations as often as annually to confirm the proper function/condition of the habitat for rail use. On an intermittent basis (once every three to four years) the rails occupying the marsh could be harmed as a result of management measures carried out to improve habitat quality. Because the disposition of the managed marsh at the close of the water transfer agreement has not been determined, no minimization measures have been incorporated to offset the impacts of potential closure. Therefore, no take is exempted for this activity.

California Brown Pelican

The Service anticipates the incidental take of California brown pelican as the loss of 12,383 bird-use years resulting from the increased rate of salinization of the Salton Sea and subsequent accelerated loss of the forage base for this species. Over the course of the years that these impacts will occur, this loss in bird use functionally equates to the number of birds impacted. This loss is anticipated to result in harm to all pelicans affected by this change and mortality to some unquantifiable (this will vary from year to year depending on foraging conditions in the Gulf of California) portion as a result of inadequate body condition to find alternative foraging sites. We also anticipate harm in the loss of roost sites for pelicans remaining at the Salton Sea as a result of the greater elevation decline associated with this project. The number affected by this change cannot be quantified as it will depend on the forage base that remains available at the river and drain mouths, but we anticipate a minimum of 25 birds would be affected annually. Lastly, we anticipate harm to an unknown number of California brown pelicans as a result of the temporary inaccessibility of the created roosts on the California coast as needed for periodic maintenance.

The Service will not refer the incidental take of any migratory bird for prosecution under the Migratory Bird Treaty Act of 1918 as amended (16 U.S.C. §§703-712) if such take is occurring in compliance with the terms and conditions (including amount and/or number) specified herein.

REASONABLE AND PRUDENT MEASURES

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of desert pupfish, Yuma clapper rail, and California brown pelican.

1. Measures shall be taken to minimize the mortality or injury of listed species associated with the loss of existing habitats.

2. Measures shall be taken to minimize the mortality or injury associated with selenium contamination in existing and created listed species habitats.

3. Measures shall be taken to minimize the mortality or injury of listed species associated with construction and maintenance/management of created habitats.

4. Measures shall be taken to minimize the mortality or injury associated with monitoring activities for listed species that are required to guide the implementation of or assure the success of the proposed fish and wildlife conservation measures.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, Reclamation must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are nondiscretionary.

1. The following terms and conditions implement reasonable and prudent measure 1:

    1.1 Reclamation and its conservation agreement partners shall configure all drain extensions in the IID and CVWD areas to maximize pupfish habitat and achieve no net loss of pupfish habitat in terms of drain length and width dimensions (i.e., areal extent) as the Salton Sea recedes.

    1.2 Reclamation and its conservation agreement partners shall provide for the creation of roost structures for California brown pelicans that are anticipated to continue to forage on the limited remaining fish at the river and drain mouths to offset the loss of existing roosts when the Salton Sea elevation drops below -235 feet. It may be possible to modify existing structures (e.g., Mullet Island or its surroundings) to preclude predator access to achieve this goal. The structures shall meet with the approval of the Service and CDFG and shall be sized to accommodate a minimum of 25 pelicans.

2. The following terms and conditions implement reasonable and prudent measure 2:

    2.1 Reclamation and its conservation agreement partners shall monitor selenium concentrations in the desert pupfish drains to assure that unanticipated impacts resulting from selenium exposure are not likely to occur. The study program set forth in Pupfish Conservation Measure 2 for determining potential selenium impacts shall include collection of baseline data for selenium concentrations in water, sediments, prey items, and surrogate fish species in the pupfish drains. Any long-term monitoring program for selenium impacts to desert pupfish shall include collection of data for tissue concentration, water concentration, or dietary concentration, as appropriate based on the results of the study program. The monitoring plan shall be developed in coordination with, and subject to the approval of, the Service and CDFG.

    2.2 Reclamation and its conservation agreement partners shall develop a habitat creation plan for the managed marsh that includes design features to minimize the

for selenium bioaccumulation in Yuma clapper rails and thus reduce the harm potentially associated with such bioaccumulation. This habitat creation plan shall be approved by the Service and CDFG prior to its implementation.

3. The following terms and conditions implement reasonable and prudent measure 3:

3.1 Reclamation and its conservation agreement partners shall design the inter-drain connections discussed in Desert Pupfish Conservation Measure 1 to minimize the maintenance requirements that could result in take of desert pupfish to the extent possible without significantly reducing their habitat value.

3.2 Where dewatering is required for construction of pupfish connections, Reclamation and its conservation partners shall implement gradual dewatering of the construction sites within potential pupfish drains to allow desert pupfish to move out of the area such that they are not stranded by dewatering. A qualified biologist shall be present to relocate pupfish to a safe location if necessary to prevent stranding as a result of the physical structure of the drain. The biologist shall maintain a complete record of all desert pupfish moved from hazardous areas during project construction. At a minimum, the information shall include: location (written description and map), date and time of observation, along with details of the relocation site; basic life history information (i.e., length and sex); and general condition and health, including any apparent injuries/state of healing.

3.3 Reclamation and its conservation agreement partners shall provide for adequate water to maintain appropriate habitat conditions for survival and reproduction of desert pupfish in the desert pupfish refugium.

3.4 Reclamation and its conservation agreement partners shall provide for funds and personnel to implement management of the pupfish refugium. Such management shall be conducted in a manner that minimizes the need for routine use of heavy equipment that could result in injury or mortality of pupfish in the refugium. Reclamation and its conservation agreement partners shall develop a management plan for the refugium that specifies the management procedures and schedule including the anticipated frequency of use of heavy equipment in the refugium. This management plan shall be developed in coordination with, and subject to the approval of, the Service and CDFG. Should more extreme management measures be required as a result of unanticipated circumstances, use of any unapproved procedures shall require the prior approval of the Service and CDFG.

3.5 Reclamation and its conservation partners shall immediately notify the Service and CDFG regarding any needed emergency repairs on the pupfish connections, pupfish selenium management measures, rail created habitat, or pelican roost structures that may result in disturbance of or impacts to the listed species so that the Service and CDFG can provide technical assistance to minimize the impacts associated with implementing the repairs.

3.6 Reclamation and its conservation partners shall implement any necessary management measures to maintain the habitat quality of the created rail habitat outside the Yuma clapper rail and California black rail breeding season of March 1 through September 15. This will avoid the injury or mortality of rail eggs and/or chicks.

3.7 Reclamation and its conservation agreement partners shall schedule regular maintenance of the created pelican roosts during the month of December to minimize disturbance of migrating pelicans and the resident population that could result in harm through a lack of access to dry sites where the birds can roost and maintain their plumage. Exceptions to this scheduling shall be approved by the Service and CDFG.

4. The following terms and conditions implement reasonable and prudent measure 4:

4.1 Survey methods for desert pupfish shall include the use of wire minnow traps with or without bait until superceded by a new Service and CDFG-approved protocol. Wire traps have proven to be more effective in comparison trials than other trap materials such as plastic, thus giving a more accurate evaluation of the status of the desert pupfish population.

4.2 Minnow traps shall be set during daylight hours only and will be checked for the presence of desert pupfish at least every three hours. There shall be no overnight trapping, as this has resulted in mortality of pupfish during low dissolved oxygen conditions that occur at night.

4.3 Handling may involve taking length measurements to assess size and age class of individuals and shall require minimal exposure out of water. Any pupfish exhibiting signs of physiological stress shall be released immediately at the point of capture to minimize the potential for injury associated with such stress.

4.4 Surveys for Yuma clapper rails shall be conducted in accordance with the approved Service protocol (Attachment C) to assure comparability with other survey efforts and minimize harassment unless authorized in advance by the Carlsbad Fish and Wildlife Office.

4.5 Disturbance to the rails during the breeding season shall be minimized to the maximum extent possible within the constraints of the survey protocol to reduce the chances of nest abandonment or other impacts to reproductive success.

4.6 Taped calls are to be used only to initially locate individual rails, and not to elicit further behavior from rails to reduce the chances of nest abandonment or other impacts to reproductive success. Tapes shall not be used to elicit responses from rails if the surveyor detects the presence of potential avian or mammalian predators that could injure or kill rail adults, chicks or eggs.

4.7 Survey activities shall not be conducted during inclement weather conditions that would significantly reduce the ability to detect the rail species or expose rail nest contents to the elements (e.g., rain or strong wind) thus resulting in the failure of eggs to hatch or reducing chick survival.

4.8 Personnel conducting the survey/monitoring activities shall have a section 10(a)(1)(A) permit issued by the Service to work with the desert pupfish and/or Yuma clapper rail (as appropriate) or have adequate qualifications and experience based on a review by the Service to qualify for such a permit to assure that the above terms and conditions are appropriately implemented and take is minimized.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of the incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded or the terms and conditions are not complied with, such incidental take represents new information requiring review of the reasonable and prudent measures provided and reinitiation of consultation. Reclamation must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures. Operations must be stopped in the interim period between initiation and completion of the new consultation if it is determined that the impact of the additional taking will cause an irreversible and adverse impact on the species, as required by 50 CFR 402.14(I).

Reporting Requirements

Reclamation shall submit reports of the previous year's activities to the Service and CDFG by March 31 of each year. This report shall include a summary of the fish and wildlife conservation actions implemented in the previous year along with the results of any monitoring/survey activities conducted. The report will also include basic statistics on the water conservation activities in the Imperial Valley (e.g., water conservation activities implemented, volume of water conserved, and acres fallowed for water conservation). The Service and CDFG shall have access to the raw data from monitoring activities for review upon request. The reporting will occur annually unless the Service and CDFG approve a longer reporting interval.

The Service's Carlsbad Fish and Wildlife Office (760-431-9440) must be notified within three working days should any listed species be found dead or injured in or adjacent to the action area. A written notification must be made within five calendar days and include the date, time, and location of the discovered animal/carcass, the cause of injury or death, and any other pertinent information. Injured animals should be transported to a qualified veterinarian or certified wildlife care facility and the Service informed of the final disposition of any surviving animal(s). All dead specimen(s)/carcass(es) shall be submitted to (1) educational/research institutions possessing the appropriate State and Federal permits, (2) Carlsbad Fish and Wildlife Office, or (3) Division of Law Enforcement (contact 310-328-1516 for further direction). Failing deposition to one of these entities, the carcass should be marked, photographed, and left in the field.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans or to develop information. The recommendations provided here do not necessarily represent complete fulfillment of the agency's 7(a)(1) responsibility for these species.

1. The Service recommends that Reclamation continue to utilize its authorities to study ways to address Salton Sea restoration for the benefit of not only listed species but a wide variety of migratory birds as well.

2. Reclamation and its conservation agreement partners should consider conducting experimental trials to identify silt removal techniques and seasonal timing that minimize the injury or mortality of desert pupfish that may be associated with removing silt from the connections as necessary maintain suitable conditions for use by desert pupfish.

3. Reclamation and its conservation agreement partners should consider implementing a program to monitor wintering mountain plovers in the Imperial Valley. This monitoring should include annual surveys for mountain plovers on a valley-wide basis. In the initial monitoring effort data would be collected to identify the habitat use patterns and winter foraging habitat requirements for this species in the Imperial Valley. A minimum of three consecutive years of data collection on habitat use/requirements would be required. This data in combination with the annual plover surveys and information on agricultural patterns throughout the Imperial Valley would be used by the Service to determine the magnitude of crop changes and subsequent potential impacts to the mountain plover so that appropriate management actions would be identified prior to losses of a magnitude that could interfere with survival and recovery. The 15-year plan provides for adequate time to complete these surveys prior to any major water conservation-related crop changes in the Imperial Valley. Three consecutive years of data collection and evaluation of that information can be accomplished before the acreage of fallowing exceeds 10,000 acres (in 2007 at the earliest, based on the current delivery schedule). This increment of 10,000 acres of fallowing is less than 5 percent of the average acreage of the preferred crop types. Such a change is not likely to impact the survival and recovery of the species.

For the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the proposed action as outlined in the BA that accompanied your July 23, 2002, request for initiation and the Errata to the BA that you submitted to this office. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary

Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation. Please contact me or Carol Roberts of my staff at (760) 431-9440 if you have any questions regarding this biological/conference opinion document.

Attachments:

Figure 1.1 - Imperial Irrigation District

Figure 1.2 - Salton Sea

Attachment A - General Approach to Monitoring Changes in Suitable Breeding Habitat for the Southwestern Willow Flycatcher

Attachment B - Feasible off-site mitigation options for brown pelicans

Attachment C - Yuma Clapper Rail Survey Protocol

Attachment D - Chronology of the Imperial Irrigation District Water Transfer and Habitat Conservation Plan

Literature Cited

General

Brown, S., Hickey, B. Harrington, and R. Gill, eds. 2001. *The U.S. Shorebird Conservation Plan, 2nd edition*. Manomet Center for Conservation Sciences, Manomet, MA.

CH2MHILL. 2002. *Imperial Irrigation District Water Conservation and Transfer Project Habitat Conservation Plan Final Environmental Impact Report/Environmental Impact Statement*. June.

Metropolitan Water District (MWD) 2000. Indirect Effects Issues Related to Colorado River Programs. Report provided by the Bureau of Reclamation to the U.S. Fish and Wildlife Service. March.

Wunder, M. B. and F.L. Knopf. In Press. Imperial Valley Agriculture is Critical to Wintering Mountain Plovers.

Desert Pupfish

Albers, P.H., D.E. Green, and C.J. Sanderson. 1996. Diagnostic criteria for selenium toxicosis in aquatic birds: dietary exposure, tissue concentrations, and macroscopic effects. *Journal of Wildlife Disease*, 32:468-485.

Barlow, G.W. 1958. High salinity mortality of desert pupfish, *Cyprinodon macularius*. *Copeia 1958* (3): 231-232.

Barlow, G.W. 1961. Social Behavior of the Desert Pupfish, *Cyprinodon macularius*, in Shore Pools of the Salton Sea, California. *Ecology*, 39:580-587.

Bennett, J. 1997. *Biological effects of selenium and other contaminants associated with irrigation drainage in the Salton Sea area, California, 1992* -94. Report to the National Irrigation Water Quality Program, United States Department of Interior, Washington, D.C. (In Press).

Besser, J.M., J.N. Huckins, E.E. Little, and T.W. La Point. 1989. Distribution and bioaccumulation of selenium in aquatic microcosms. *Environmental Pollutants*, 62:1-12.

Besser, J.M., T.J. Canfield, and T.W. LaPoint. 1993. Bioaccumulation of organic and inorganic selenium in a laboratory food chain. *Environmental Toxicological Chemistry*, 12:57-72.

Birkner, J.H. 1978. *Selenium in aquatic organism s from seleniferous habitats*. Ph.D. Dissertation. Colorado State University, Fort Collins, CO. 121p.

Black, G.F. 1980. Status of the Desert Pupfish, *Cyprinodon macularius* (Baird and Girard), in California. California Department of Fish and Game, Inland Fisheries, Endangered Species Program Special Publication 80-1. Sacramento, California.

Bolster, B.B. 1990. Desert Pupfish, Five Year Status Report. Inland Fisheries Division, California Department of Fish and Game. Rancho Cordova.

Bureau of Land Management. 2001. *Revised Biological Opinion on Transportation and Delivery of Central Arizona Project Water to the Gila River Basin in Arizona and New Mexico and its Potential to Introduce and Spread Nonnative Aquatic Species* (2-21-90-F-119a). April 17.

Canton, S.P. 1997. Difficulties with traditional approaches in setting aquatic life water quality criteria for selenium. Abstract **In**: *Understanding Selenium in the Aquatic Environment, Proceedings of a Symposium in Salt Lake City, Utah, M arch 6 -7, 1997.* Kennecott Utah Copper, Magna, UT.

CAST. 1994. *Risk and benefits of selenium in agriculture.* Issue Paper No. 3. Council for Agricultural Science and Technology, Ames, IA.

Cech, J.J., Jr., B.W. Wilson, and D.G. Crosby. 1998. Multiple Stresses in Ecosystems. Lewis Publishers, Boca Raton, FL. 202 p.

CH2MHILL. 2002. *Imperial Irrigation District Water Conservation and Transfer Project Habitat Conservation Plan Final Environmental Impact Report/Environmental Impact Statement.* June.

Cox, T.J. 1972. The Food Habits of Desert Pupfish (Cyprinodon macularius) in the Quitobatiquito Springs, Organ Pipe Cactus National Monument, Arizona. *Journal of the Arizona-Nevada Academy of Science*, **7**: 25-27.

Curtois, L.A. and S. Hino 1979. Egg Deposition of the Desert Pupfish, *Cyprinodon macularius*, in Relation to Several Physical Parameter. *California Fish and Game*, **65**:100-105.

Crear, D and I. Haydock. 1971. Laboratory Rearing of the Desert Pupfish, *Cyprinodon macularius. Fishery Bulletin*, **69(1)**:151-156.

Dunham J.B. and W.L. Minckley. 1998. Allozymic Variation in Desert Pupfish from Natural and Artificial Habitats: Genetic Conservation in Fluctuating Populations. *Biological Conservation*, **84 (1)**:7-15.

Echelle A.A., R.A. Van Den Bussche, T.P. Malloy Jr., M.L. Haynie, C.O. Minckley. 2000. Mitochondrial DNA Variation in Pupfishes Assigned to the Species Cyprinodon macularis (Atherinomorpha: Cyprinodontidae): Taxonomic Implications and Conservation Genetics. *Copeia*, **2000(2)**:353-364.

Eisler, R. 1985b. *Selenium hazards to fish, wildlife, and invertebrates: a synoptic review. Contaminant Hazard Reviews*. Report No.5. Patuxent Wildlife Research Center, U.S. Fish and Wildlife Service, Laurel, MD.

Fairbrother, A., and J . Fowles . 1990. Subchronic effects of sodium selenite and selenomethionine on several immune functions in mallards. *Archives of Environmental Contaminants Toxicology*, **19**:836-844.

Gober, J. 1994. The relative importance of factors influencing selenium toxicity. pp. 1021-1031 **In**: Effects of Human-Induced Chan ges on Hydrologic Systems (R.A. Mars ton and V.R. Has further eds.),. Proceedings of Annual Summer Symposium of the American Water Resources Association, June 26-29, 1994, Jackson Hole, WY. American Water Resources Association, Bethesda, MD.

Hamilton, S.J. 1998. Selenium effects on endangered fish in the Colorado River Basin. pp. 297-313 **In**: *Environmental Chemistry of Selenium* (W.T. Frankenberger, Jr., and R .A. Engberg eds.). Marcel Dekker, Inc., New York, NY.

Heinz, G.H. 1996. Selenium in birds . Pages 453-464 **In**: *Interpreting Environmental Contaminants in Animal Tissues* (W.N. Beyer, G.H. Heinz, and A.W. Red mon, eds.). Lewis Publishers, Boca Raton, FL.

Heinz, G.H., and M.A. Fitzgerald. 1993. Overwinter survival of mallards fed selenium. *Archives of Environmental Contaminants Toxicology*, **25**:90-94.

Heinz, G.H., and D.J . Hoffman. 1998. Methylmercury chloride and selenomethionine interactions on health and reproduction in mallards. *Environmental Toxicology and Chemistry*, **17**:139-145.

Imperial Irrigation District. 1994. *Final Environmental Impact Report for Modified East Lowline Trifolium Interceptors and the Completion Projects of the Water Conservation Program* (Volume 1). Published by the Imperial Irrigation District. May.

Koller, L.D., and J.H. Exon. 1986. The two faces of selenium -- deficiency and toxicity -- are similar in animals and man. *Canadian Journal of Veterinary Research*, **50**:297-306.

Lau, S. and C. Boehm. 1991. A Distribution Survey of Desert Pupfish (*Cyprinodon macularius*) Around the Salton Sea, California. Department of Fish and Game, Region 5, Final Report. Project EF90XII-1.

Lemly, A.D. 1985. Toxicology of selenium in a fresh water reservoir: implications for environmental hazard evaluation and safety. *Ecotoxicology and Environmental Safety*, **10**:314-338.

Lemly, A.D. 1993. Metabolic stress during winter increases the toxicity of selenium to fish. *Aquatic Toxicology*, **27**:133-158.

Lemly, A.D. 1996a. Assessing the toxic threat of selenium to fish and aquatic birds. *Environmental Monitoring Assessment*, **43**:19-35.

Lemly, A .D. 1996b. Selenium in aquatic organism s. pp.427-445 **In**: *Interpreting Environmental Contaminants in Animal Tissues* (W.N. Bey er, G .H. Heinz, and A.W. Redmon, eds.). Lewis Publishers, Boca Raton, FL.

Lemly, A.D. 1997 . Ecosystem recovery following selenium contamination in a freshwater reservoir. *Ecotoxicology and Environmental Safety*, **36**:275-281.

Lillebo, H.P., S. Shaner, D. Carlson, N. Richard, and P. DuBowy. 1988. *Water quality criteria for selenium and other trace elements for protection of aquatic life and its uses in the San Joaquin Valley.* SWRCB Order No. W.Q. 85-1 Technical Committee Re port, Appendix D. California State Water Resources Control Board, Sacramento, CA.

Lowe, C.H., D.S. Hinds, E.A. Halpern. 1967. Experimental Catastrophic Selection and Tolerances to Low Oxygen Concentrations in Native Arizona Freshwater Fishes. *Ecology*, **48**(6):1013-1017.

Luoma, S.N., and R. Linville. 1997. *A comparison of selenium and mercury concentrations in transplanted and resident bivalves from North San Francisco Bay.* pp. 160 -170 **In**: 1995 Annual Report: San Francisco Estuary Regional Monitoring Program for Trace Substances. San Francisco Estuary Institute, Richmond, CA.

Maier, K .J. and A .W. Knight. 1994 . Ecotoxicology of Selenium in Freshwater Systems. *Reviews of Environmental Contamination and Toxicology*, **134**:31-48.

Marsh, P.C. and D.E. Sada. 1993. Desert Pupfish (*Cyprinodon macularius*) Recovery Plan. Region 2. U.S. Fish and Wildlife Service.

Meili, M. 1996. *Dramatic effects of selenium addition to lakes on the mercury concentrations and the survival of fish.* Fourth International Conference on Mercury as a Global Pollutant, August 4-8, 1996, Hamburg, Germany. Abstract Book, p. 26.

Miller, R.R.1948. *The cyprinodont fishes of Death Valley system of eastern California and southwestern Nevada.* Miscellaneous Publications Museum of Zoology University of Michigan. **68.** 155 pages.

Miller, R.R. and L.A. Fiuman. 1987. Description and Conservation Status of *Cyprinodon macularius eremus*, a New Subspecies Along the LCR. Year 3-1998. Submitted to U.S. Bureau of Reclamation, LCR region, Boulder City, Nevada and U.S. Fish and Wildlife Service, Carlsbad, California.

Minckley, W.L. 1980. *Cyprinodon macularius* (Baird and Girard). Desert Pupfish. pg. 497 In: *Atlas of North American Freshwater Fishes* (Lee, D.S., C.R. Gilbert, C.H. Future restoration efforts (currently being planned) to reduce the existing DDT contamination in the Southern California Bight would be beneficial to this breeding population. Hocutt, R.E. Jenkins, D.E. McAllister, and J.R. Stauffer, Jr., eds), North Carolina Museum of Natural History, Raleigh, North Carolina.

Moore, S.B., J . Winckel, S .J. Detwiler, S.A . Klasing, P .A. Gaul, N.R. Kanim, B.E. Kesser, A.B. DeBevec, K . Beardsley, and L.K . Puckett. 1990. *Fish and Wildlife Resources and Agricultural Drainage in the San Joaquin Valley, California.* Two Volumes. San Joaquin Valley Drainage Program, Sacramento, CA.

Moyle, P.B. 1976. *Inland Fishes of California.* University of California Press, Berkeley.

Naiman, R.J. 1979. Preliminary Food Studies of *Cyprinodon macularius* and *Cyprinodon nevadensis* (Cyprinodontidae). *Southwestern Naturalist,* **24**:538-541.

National Research Council (NRC). 1980. *Mineral Tolerance of Domestic Animals.* Committee on Animal Nutrition, NRC. National Academy of Sciences, Washington, D C.

National Research Council (NRC). 1984. *Nutrient Requirements of Poultry. Eighth Revised Edition.* Committee on Animal Nutrition, N RC. Nation al Academy of Sciences, Washington, DC.

National Research Council (NRC). 1989. *Irrigation-Induced Water Quality Problems: What Can Be Learned From the San Joaquin Valley Experience.* Committee on Irrigation-Induced Water Quality Problems, Water Science and Technology Board, Commission on Physical Sciences, Mathematics, and Resources , NRC. National Academy Pres s, Washing ton, DC.

Neigel, J.E. and J.C. Avise. 1986. Phylogenetic relationships of mitochondrial DNA under various demographic models of speciation, p.515-534 **In**: *Evolutionary processed and theory* (E. Nevo and S. Karlin eds.). Academic Press, New York.

Nicol, K., L. Sabrina, and C. Boehm. 1991. *A distribution survey of desert pupfish (*Cyprinodon macularius*) around the Salton Sea, California.* Prepared for California Department of Fish and Game, Inland Fisheries Division.

Ohlendorf, H.M. 1996. Selenium. pp. 128 -140 **In**: *Noninfectious Diseases of Wildlife. Second Edition* (A. Fairbrother, L .N. Locke, and G.L. Hoff, eds .). Iowa State University Press, Ames, IA.

Oldfield , J.E. 1990. *Selenium : its uses in agriculture, nutrition and health, and environment.* Special Publication. Selenium-Tellurium Development Association, Inc., Darien, CT.

Pease, W., K. Taylor, J. Lacy, and M. Carlin . 1992 . *Derivation of site-specific water quality criteria for selenium in San Francisco Bay.* Staff Report, California Regional Water Quality Control Board - San Francisco Bay Region, Oakland, CA. 37 p.

Peterson, J.A. and A.V. Nebeker. 1992. Estimation of waterborne selenium concentrations that are toxicity thresholds for wildlife. *Archives of Environmental Contamination and Toxicology*, **23**:154-162.

Piper, D.Z., and M.D. Medrano. 1994. *Geochemistry of the Phosphoria Formation at Montpelier Canyon, Idaho: Environment of deposition. The Phosphoria Formation: Its Geochemical and Biological Environment of Deposition.* U.S. Geological Survey Bulletin 2023.

Pister, E.P. 1974. Desert Fishes and Their Habitats. *Transactions American Fisheries Society*, **103(3)**:53-60.

Presser, T.S. 1994. "The Kesterson Effect." *Environmental Management*, **18**(3):437-454.

Presser, T.S. an d H.M. Ohlendorf. 1987. Biogeochemical cycling of selenium in the San Joaquin Valley, California, USA. *Environmental Management*, **11**:805-821.

Presser, T.S. and D.Z. Piper. 1998. Mass balance approach to selenium cycling through the San Joaquin Valley: From source to river to bay. pp. 153-182 **In:** *Environmental Chemistry of Selenium.* (W.T. Frankenberger, Jr., and R.A. Engberg, eds .). Marcel Dekker, New York. 713 p.

Presser, T.S., M.A. Sylvester, and W.H. Low. 1994. Bioaccumulation of selenium from natural geologic sources in western states and its potential consequences. *Environmental Management*, **18**:423-436.

San Francisco Estuary Institute(SFEI). 1997a. *1995 Annual Report: San Francisco Estuary Regional Monitoring Program for Trace Substances.* San Francisco Estuary Institute, Richmond, CA. 324 pp.

Schamber, R.A ., E.L. Belden , and M .F. Raisbeck. 1995. Immunotoxicity of chronic selenium exposure. Pages 384-393 **In:** *Decades Later: A Time For Reassessment* (G.E. Schuman and G.F. Vance, eds.). Proceedings of the 12th Annual National Meeting, American Society of Surface Mining and Reclamation, Princeton, WV.

Schoenherr, Allan A. 1992. *A natural history of California.* University of California Press. Los Angeles, California. 772 pp.

Seiler, R.L. 1997. *Methods to identify areas susceptible to irrigation-induced selenium contamination in the western United States.* U.S. Geological Survey Fact Sheet FS-038-97, Carson City, NV.

Seiler, R.L., and J.P. Skorupa. In Press. *Water quality constraints on irrigated agriculture. U.S. Department of Interior investigations of irrigation-induced contamination of water, sediment, and biota.* Fact Sheet No. FS-000-97. U.S. Geological Survey, Carson City, NV

Setmire, J. 1993. *Detailed study of water quality, bottom sediment, and biota associated with irrigation drainage in the Salton Sea Area, California, 1988-1990.* Water-Resources Investigations Report 93-4014 U.S. Geological Survey, Sacramento, CA.

Setmire , J.G., and R .A. Schroeder. 1998. Selenium and salinity concerns in the Salton Sea area of California. pp. 205-221 **In:** *Environmental Chemistry of Selenium* (W.T. Frankenberger, Jr., and R.A. Engberg, eds.). Marcel Dekker, Inc., New York, NY.

Setmire , J.G., J.C. Wolfe, and R.K . Stroud. 1990. *Reconnaissance investigation of water quality, bottom sediment, and biota associated with irrigation drainage in the Salton Sea Area, California, 1986-87.* Water-Resources Investigations Report 89-4 102. U.S. Geological Survey, Sacramento CA.

Skorupa, J.P. 1998. Selenium poisoning of fish and wildlife in nature: Lessons from twelve real-world examples. pp. 315-354 **In:** *Environ mental Chemistry of Selenium* (W.T. Frankenberger an d R.A. Engberg, eds.). Marcel Dekker, New York, NY.

Skorupa, J.P., S.P. Morman, and J.S. Sefchick-Edwards. 1996. *Guidelines for interpreting selenium exposures of biota associated with nonmarine aquatic habitats.* Report to U.S. Department of Interior, National Irrigation Water Quality Program. U.S. F ish an d Wildlife Service, Division of Environmental Contaminants, Sacramento, CA. 74 p.

Sorensen, E.M.B. 1991. *Metal Poisoning in Fish.* CRC Press, Boca Raton, FL.

Sutton, R. 1999. The Desert Pupfish of the Salton Sea: A Synthesis. Prepared for the Salton Sea Authority. August 5, 1999.

Sutton, R. 2000. *Salton Sea Desert Pupfish Movement Study.* U.S. Bureau of Reclamation Denver, Colorado. Prepared for the Salton Sea Authority, La Quinta, CA. January 19.

Taylor, K., W. Peas e, J. Lacy, and M. Carlin. 1992 . *Mass emissions reduction strategy for selenium.* Staff Report. Basin Planning an d Protection Unit. California Regional Water Quality Control Board - San Francisco Bay Region, Oakland, CA. 53 p.

Taylor, K., J. Lacy, and M. Carlin. 1993. *Mass emissions reduction strategy for selenium.* Supplemental Staff Report. Basin Planning and Protection Unit. California Regional Water Quality Control Board - San Francisco Bay Region, Oakland, CA. 61 p.

Tully, W.C., and K.W. Franke. 1935. A new toxicant occurring naturally in certain samples of plant foodstuffs. VI. A study of the effect of affected grains on growing chicks. *Poultry Science,* **14**:280-284.

University of California, Los Angeles (UCLA). 1983. Enhancements of Habitats for the Yuma Clapper Rail and Desert Pupfish in the Vicinity of the Salton Sea, California. *Environmental Science and Engineering*, Report No. 83-52. February.

United States Department of the Interior, Bureau of Reclamation (USDI-BOR). 1993. *Predicted selenium effect levels for Kendrick and Middle Green River remediation (Irrigation Drainage).* Memo from Joy Gober, Soil Scientist, to Irrigation Program Manager, June, 1993. Bureau of Reclamation, Denver Office, Denver, CO. Type d, 4 p .

United States Department of the Interior, Bureau of Reclamation/Fish and Wildlife Service/Geological Survey/Bureau of Indian Affairs (USDI-BOR/FWS/GS/BIA). 1998. *Guidelines for Interpretation of the Biological Effects of Selected Constituents in Biota, Water, and Sediment.* National Irrigation Water Quality Program Information Report No. 3. Bureau of Reclamation, Denver, CO. 198 p.

U. S. Fish and Wildlife Service (USFWS). 1986. Endangered and threatened wildlife and plants; determination endangered status and critical habitat for the desert pupfish. *Federal Register,* **51(61)**: 10842-10851, March 31.

USFWS. 1993. Notice of a Draft Recovery Plan for Desert Pupfish; (*Cyprinodon macularius*). U.S. Fish and Wildlife Service, Region 2, Phoenix, AZ. *Federal Register*, **58** 6526. January 29.

Walker, B.W., R.R. Whitney, and G.W. Barlow. 1961. The fishes of the Salton Sea. **In:** *CDFG Fish Bulletin No. 113 Ecology of the Salton Sea, California, in relation to the sportfishery* (ed. B.W. Walker) pp. *77-92.California Department of Fish and Game Fish Bulletin*, No. 113: 204 pp.

Whiteley, P.L., and T.M. Yuill. 1989. *Immune function and disease resistance of waterfowl using evaporation pond systems in the southern San Joaquin Valley, California, 1986-89.* Final Report to the U.S. Fish and Wildlife Service, National Wildlife Health Research Center, Madison, WI. 202 p.

Wilber, C.G. 1980. Toxicology of selenium: a review. *Clinical Toxicology*, 17:171-230.

Yuma clapper rail

American Ornithologists' Union. 1957. *Check-List of North American Birds, 5th ed.* American Ornithologists' Union, Washington, D.C.

American Trader Trustee Council. 2001. *Restoration Plan and Environmental Assessment for Seabirds Injured by the American Trader Oil Spill.* 44 pp.

Anderson, B.W. and R.D. Ohmart. 1985. Habitat use by Clapper Rails in the Lower Colorado River Valley. *Condor*, **87**:116-126.

Bennett, W.W. and R.D. Ohmart. 1978. *Habitat Requirements and Population Characteristics of the Clapper Rail* (Rallus longirostris yumanensis) *in the Imperial Valley of California.* Prepared for The University of California, Lawrence Livermore Laboratory P.O. 3452103. January.

Bureau of Land Management. 2001. *Revised Biological Opinion on Transportation and Delivery of Central Arizona Project Water to the Gila River Basin in Arizona and New Mexico and its Potential to Introduce and Spread Nonnative Aquatic Species,* (2-21-90-F-119a). April 17.

CDFG. 1990. *1989 Annual Report on the Status of California's Listed Threatened and Endangered Plants and Animals.* Sacramento, California.

CDFG. 1991. *1990 Annual Report on the Status of California's Listed Threatened and Endangered Plants and Animals.* Sacramento, California. 203pp.

CH2MHill. 2002. *Imperial Irrigation District Water Conservation and Transfer Project Habitat Conservation Plan Final Environmental Impact Report/Environmental Impact Statement.* June.

Conway, C.J. W.R. Eddleman, S.H. Anderson, and L.R. Hanebury. 1993. Seasonal Changes in Yuma Clapper Rail Vocalization Rate and Habitat Use. *Journal of Wildlife Management,* **57(2)**:282-290.

Dickey, D.R. 1923. Description of new Clapper Rail from the Colorado River Valley. *Auk,* **40**:90-94.

Eddleman, W.R. 1989. *Biology of the Yuma Clapper Rail in the Southwestern U.S. and Northwestern Mexico.* USBR, IA No. 4 -AA-30-020060.

Eddleman, W.R. and C.J. Conway. 1994. Chapter 12 Clapper Rail **In:** *Migratory Shore and Upland Game Bird Management In North America* (T.C. Tacha and C. E. Braun, eds.). International Association of Fish and Wildlife Agencies in cooperation with the Fish and Wildlife Service, U.S. Dept. of the Interior; ASIN: 0935868755.

Hurlbert, A., M. Clary, M. Hunnicut, J. McGinnis, K. Sturm, and J. Vasquez. 1997. *Wildlife Use of Agricultural Drains in the Imperial Valley, California.* U.S. Fish and Wildlife Service, Salton Sea National Wildlife Refuge.

McKernan, R.L. and G. Braden. 1999. *Status, distribution, and habitat affinities of the southwestern willow flycatcher along the LCR Year 3-1998.* Submitted to U.S. Bureau of Reclamation, LCR region, Boulder City, Nevada and U.S. Fish and Wildlife Service, Carlsbad, CA.

Monson, G. and A. Phillips. 1981. *Revised Checklist of Arizona Birds.* University of Arizona Press, Tucson.

NatureServe 2001. http://www/natureserve.org

Nevada Division of Wildlife (NDOW). 1998. *Comments on LCR MSCP Preliminary Species Conservation Foals: Bird Species.* Prepared by C. Tomlinson, nongame biologist, Nevada Division of Wildlife, Las Vegas, Nevada.

Ohmart, R.D. and R.W. Smith. 1973. *North American Clapper Rail (*Rallus longirostris*) Literature Survey With Special Consideration Being Given to the Past and the Present Status of yumanensis.* USBR, Contract No. 14-06-300-2409.

Ohmart, R.D. and R.E. Tomlinson. 1977. Foods of Western Clapper Rails. *Wilson Bulletin,* **89**:332-336.

Patten, M.A., G. McCaskie, P. Unitt. In Press. *Birds of the Salton Sea: Status, Biogeography, and Ecology.*

Piest, L. And J. Campoy. 1998. *Report of Yuma Clapper Rail Surveys at Cienega de Santa Clara, Sonora.* Unpublished Report.

Point Reyes Bird Observatory. 1999. *Preliminary Findings of 1999 Bird Surveys Through August.* Unpublished Data.

Rosenberg, K.V., R.D. Ohmart, W.C. Hunter, and B.W. Anderson. 1991. *Birds of the LCR Valley.* University of Arizona Press, Tucson, AZ.

Setmire, J.G., J.C Wolfe, and R.K. Stroud. 1990. Reconnaissance investigation of water quality, bottom sediment, and biota associated with irrigation drainage in the Salton Sea area, California, 1986-1987. *U.S. Geological Survey Water-Resources Investigative Report,* 89-4102.

Sykes, G. 1937. The Colorado Delta. *American Geographic Society Special Publication,* **19.**

Todd, R.L. 1986. *A Saltwater Marsh Hen in Arizona, A History of the Yuma Clapper Rail* (Rallus longirostris yumanensis). A Federal Aid Project. W-95-R, Completion Report.

USDOI. 1998. *Guidelines for Interpretation of the Biological Effects of Selected Constituents in Biota, Water, and Sediment.* Report No. 3

USFWS. 1967 .Endangered and threatened wildlife and plants; determination endangered status and for the Clapper Rail. *Federal Register,* 32: 4001. March 11.

USFWS. 1983. *Yuma Clapper Rail Recovery Plan.* U.S. Fish and Wildlife Service, Albuquerque, New Mexico.

USFWS. 1999. *Planning Aid Report Salton Sea Restoration Project, Imperial and Riverside Counties, California.* Report prepared by the Service for the Bureau of Reclamation, Boulder City, Nevada.

California Black Rail

Arizona Game and Fish Department (AGFD). 1996. *Wildlife of Special Concern in Arizona* (Public Review DRAFT). Phoenix, AZ, 85023-4399. March 16.

CDFG. 1991. *1990 Annual Report on the Status of California's Listed Threatened and Endangered Plants and Animals.* Sacramento, California. 203pp.

Eddleman, W.R. and C.J. Conway. 1994. Chapter 12 Clapper Rail **In:** *Migratory Shore and Upland Game Bird Management In North America* (T.C. Tacha and C. E. Braun, eds.). International Association of Fish and Wildlife Agencies in cooperation with the Fish and Wildlife Service, U.S. Dept. of the Interior; ASIN: 0935868755.

Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1988. *The Birder's Handbook.* Simon and Schuster Inc. New York, New York, 785 pp.

Evens, J.G., G.W. Page, S.A. Laymon, and R.W. Stallcup. 1991. Distribution, relative abundance and status of the California Black Rail in western North America. *Condor,* **93**:952-966.

Flores, R.E. and W.R. Eddleman. 1991. California Black Rail use of habitat in southwestern Arizona. *Journal of Wildlife Management,* **59**:357-363.

Garrett, K. and J. Dunn. 1981. *Birds of southern California: status and distribution.* Los Angeles Audubon Society; 408pp.

Jurek, R.M. 1975. *Survey of Yuma Clapper Rails and California Black Rails along Coachella Canal, Imperial County, May 1975, California Department of Fish and Game.* Nongame Wildlife Investigations. June 6.

Laymon, S.A., J.G. Evens, and R.W. Stallcup. 1990. *Distribution and abundance of the California Black Rail in south-eastern California.* Report prepared for the California Department of Fish and Game, 1416 ninth St., Sacramento, CA 95814. Contribution No. 480 of Point Reyes Bird Observatory.

Patten, M.A., G. McCaskie, P. Unitt. In Press. *Birds of the Salton Sea: Status, Biogeography, and Ecology.*

Piest, L. And J. Campoy. 1998. *Report of Yuma Clapper Rail Surveys at Cienega de Santa Clara, Sonora*. Unpublished Report.

Repking, C.F. and R.D. Ohmart. 1977. Distribution and density of black rail populations along the LCR. *Condor*, **79**:486-489.

Rosenberg, K.V., R.D. Ohmart, W.C. Hunter, and B.W. Anderson. 1991. *Birds of the LCR Valley*. University of Arizona Press, Tucson, AZ.

Scott, S.L. (ed.) 1987. Field Guide to the Birds of North America. 2nd edition. National Geographic Society, Washington, D.C.

Snider, P.R. 1969. Southwest Region. *Audubon Field Notes*, **23**:681.

U.S. Bureau of Reclamation and Salton Sea Authority. 2000. *Draft Salton Sea Restoration Project Environmental Impact Statement/Environmental Impact Report, January 2000*. Boulder City, Nevada.

USFWS. 1994. *Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species; Proposed Rule*. U.S. Department of the Interior. *Federal Register*, 50 CFR Part 17. November 15.

USFWS. 1996. Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa That Are Candidates for Listing as Endangered or Threatened Species. Notice of Review. *Federal Register*, **61**(40). February 28.

California brown pelican

Allen, L.G. 1999. *Fisheries Inventory and Utilization of San Diego Bay, San Diego, California. Final Report Sampling Periods July 1994-April 1999*. Report prepared by Nearshore Marine Fish Research Program, California State University, Northridge for the Department of the Navy Agreement # N68711-94-LT-4033.

Anderson, D.E. 1993. Personal communication with Harry Ohlendorf, CH2MHill. 2002. Appendix A: Species Covered by the HCP. Volume 5. **In**: *Imperial Irrigation District Water Conservation and Transfer Project Habitat Conservation Plan Final Environmental Impact Report/Environmental Impact Statement*. June.

Bennett, J. 1996. *Biological Effects of Selenium and Other Contaminants Associated with Irrigation Drainage in the Salton Sea Area, California, 1992-1994*. Studies Performed for the Remediation Phase (IV) of the National Irrigation Water Quality Program, Department of the Interior.

Briggs, K. T., D. B. Lewis, W. B. Tyler, and G. L. Hunt, Jr. 1981. Brown pelicans in southern California: habitat use and environmental fluctuations. *Condor*, 83:1-15.

CDFG. 1992. *Annual Report on the Status of California State Listed Threatened and Endangered Animals and Plants*. State of California, The Resource Agency.

Cogswell, H. L. 1977. *Water birds of California*. University of California Press, Berkeley. 399pp.

Costa-Pierce, B. and R. Reidel. 2000. Final Report: Fish Biology and Fisheries Ecology of the Salton Sea. April 18.

Garrett, K., and J. Dunn. 1981. *Birds of southern California*. Los Angeles Audubon Society. 408pp.

Imperial Irrigation District. 1994. *Final Environmental Impact Report for Modified East Lowline Trifolium Interceptors and the Completion Projects of the Water Conservation Program* (Volume 1). Published by the Imperial Irrigation District. May.

Kaufmann, K. 1996. *Lives of North American Birds*. Houghton Mifflin Company. Boston, Massachusetts.

National Oceanic and Atmospheric Administration (NOAA). 1995. *Habitat Equivalency Analysis: An Overview*. Policy and Technical Paper Series, No. 95-1. March 21, 1995 (Revised October 4, 2000).

Palmer, R. S. 1962. *Handbook of North American birds. Vol. 1*. Yale University Press, New Haven, Connecticut, 567pp.

Patten, M.A., G. McCaskie, P. Unitt. In Press. Birds of the Salton Sea: Status, Biogeography, and Ecology.

Schreiber, R.W. and E.A Schreiber. 1982. Essential Habitat of the Brown Pelican in Florida. Florida Field Naturalist, **10(1)**: 9-17.

Strong, C.S. 2002a. Brown Pelican Roost Sites on the Mainland Coast of Southern California: Size, Quality, and Value of Diurnal Roost Sites. Final Report by Crescent Coastal Research, Astoria, OR prepared for the American Trader Trustee Council. April.

Strong, C.S. 2002b. Night Roost Sites for Brown Pelicans on the Mainland Coast of Southern California. Final Report by Crescent Coastal Research, Astoria, OR prepared for the American Trader Trustee Council. May.

Thelander, C.G. and M. Crabtree. 1994. *Life on the Edge. A Guide to California's Endangered Natural Resources*. Heydey Books, Berkeley, California.

U.S Army Corps of Engineers. 1996. *Imperial County Watershed Study, California. Draft Reconnaissance Phase Study*. U.S. Army Corps of Engineers, Los Angeles District.

USFWS. 1970. Endangered and threatened wildlife and plants; determination endangered status and for the California brown pelican. *Federal Register,* 35 (2): 16047. October 13.

USFWS. 1983. *The California Brown Pelican Recovery Plan*. U.S. Fish and Wildlife Service, Region 1, Portland, Oregon, under contract with California Department of Fish and Game and University of California at Davis.

USFWS. 1996. Wildlife Mortality Estimates-1987-1996, Salton Sea. http://r1/fws/gov/news/saltnsum.htm (March 21,2000).

Wetmore, A. 1945. A review of the forms of the brown pelican. *Auk*, 62:557-586.

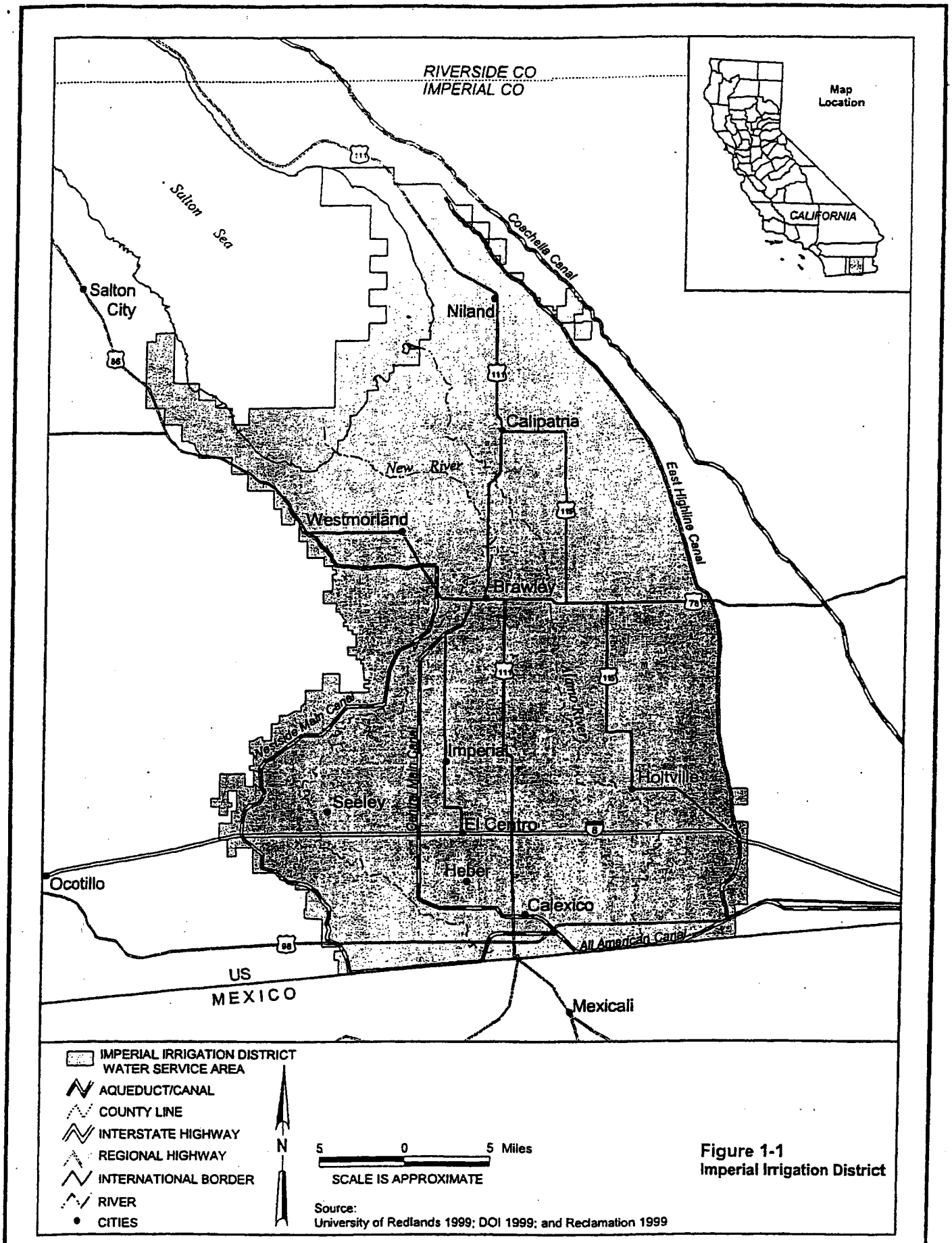

Figure 1-1
Imperial Irrigation District

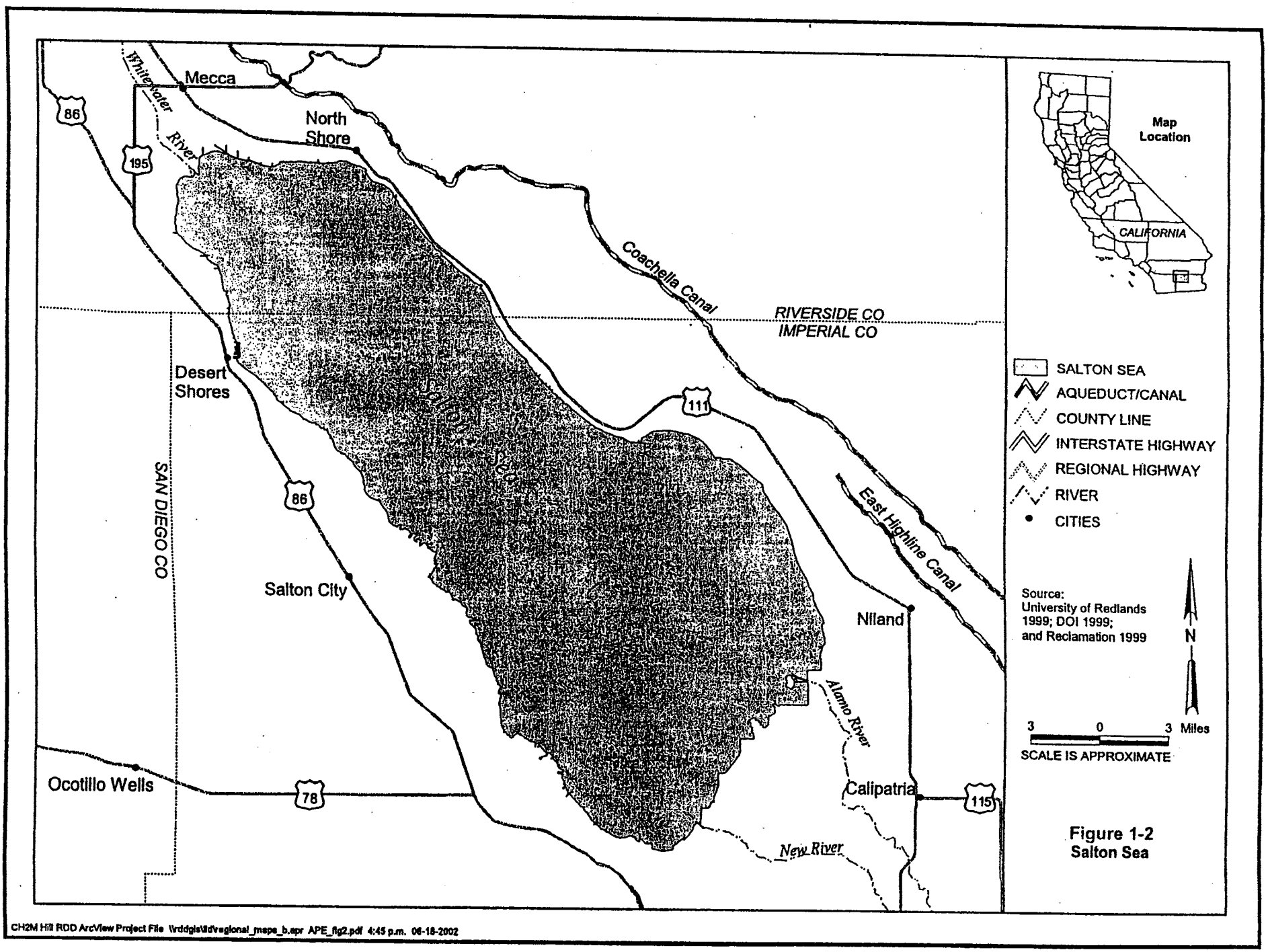

Figure 1-2
Salton Sea

CH2M Hill RDD ArcView Project File \\rddgis\lid\regional_maps_b.apr APE_fig2.pdf 4:45 p.m. 06-18-2002

Attachment A

General Approach to Monitoring Changes in Suitable Breeding Habitat for the Southwestern Willow Flycatcher

Under Willow Flycatcher Conservation Measures 1 and 2, Reclamation and its conservation agreement partners will conduct a baseline survey and periodic subsequent surveys to quantify net changes in the total amount of suitable breeding habitat for the willow flycatcher in areas adjacent to the Salton Sea, East Highline Canal, and planned lateral interceptor projects. Areas of suitable breeding habitat would be mapped using the most appropriate technology (e.g., aerial photography and satellite imagery). As appropriate and necessary, a geographic information system (GIS) of the habitat data will be developed.

The same process will be used for conducting the subsequent surveys. Mapped areas will be revisited to determine if there have been changes in the extent of suitable breeding habitat in each area. The boundaries of the mapped areas of suitable breeding habitat will be updated as appropriate. In addition to revising the mapped areas, every five years Reclamation and its conservation agreement partners will acquire recent (no greater than one year old) Digital Orthophoto Quarter Quadrangles (DOQQs) or aerial photographs and review them to determine if tamarisk has colonized new areas. If the photographs indicate that suitable breeding habitat for willow flycatchers may have developed in new areas, these new areas will be surveyed and mapped using the same methods as for the baseline surveys. The GIS, if one was developed, will be updated accordingly. Reclamation and its conservation agreement partners will submit a report of the baseline and subsequent surveys to the Service and CDFG within six months of completing the surveys.

ATTACHMENT B

Feasible off-site mitigation options for brown pelicans

Location	Roost Site	Forage Base Enhancement	Action	Remarks
Santa Barbara(Outer)	X		Place and anchor barge	Historically provided habitat for about 1,000 brown pelicans
San Diego Bay (South)	X		Install appropriate structures, such as pilings at individual sites	Several sites currently used by brown pelicans. Surveys for suitable sites needed.
Buena Vista Lagoon	X	X	Install floating docks. Create islands from dredge and spoil material. Install tidal flood gate.	No current use by brown pelicans.
Moss Landing – Salt Ponds Enhancement	X		Operate/maintain tidal flood gates for 6 ponds	Current use by about 3,000 pelicans.
Parson's Slough (part of Elkhorn Slough)	X		Install/operate/ maintain tidal flood gate. Restore existing islands/create additional islands	Use of 1/3 acre island by about 30 pelicans.
San Dieguito Lagoon	X		Install floating docks or permanent pilings	No current use by brown pelicans. Restoration plan pending.
Bataquitos Lagoon	X		Install floating docks	Small numbers of brown pelicans current use tidal mudflats and sandbar
San Elijio Lagoon	X	X	Move and enlarge connection to ocean. Install floating docks	Current use uncertain.
Ocean Waters – Southern California Coast	X		Place and anchor barge(s)	No estimate of current use of similar structures

Source: Glenn Black, California Department of Fish and Game.

Attachment C

YUMA CLAPPER RAIL SURVEY PROTOCOL
JANUARY 2000

These instructions are for the official surveys for Yuma clapper rail (*Rallus longirostris yumanensis*) which are used to provide information on population trends of this endangered species. Significant changes have been made from earlier survey protocols and these instructions require the use of the new survey tape. These instructions will be in place for the 2000-2004 survey seasons, after which the Fish and Wildlife Service will review them in concert with the Yuma Clapper Rail Recovery Team. If there are questions about this survey protocol, or to obtain cassette tapes for use in the survey, please contact the Arizona Ecological Services Office at the address at the end of this document.

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1. Please review the list of official survey locations on pages 3 and 4. If your agency will be unable to survey any or all of the assigned locations, please contact the AESO as soon as possible so we can try and find volunteers to survey the location.

2. Before any survey for the Yuma clapper rail, review the training tape and the survey tape to become familiar with the various calls. The tapes repeat various "clatter" and "kek" calls and are 60 minutes long. This will allow you to complete several stops before having to rewind. Also, make sure your tape recorder and speaker produce good quality sound at 80 decibels, measured one meter from the speaker.

3. Use 1:24000 USGS topolographic maps for base maps Sections of the map should be enlarged to show the survey location and route. Before beginning the survey, review maps of past surveys. Note especially the placement of "stops" from previous years. The same stops should be used, maintaining the same number. Any new stops added should have a unique number and be recorded on the map. GPS may be used to more carefully delineate stop locations.

4. All official surveys must be conducted between March 15 and May 15. The survey protocol calls for 2 surveys of each location or route per year. A third survey can be added if time and staff resources permit. There is a minimum of one week between surveys. Surveys should be conducted on the same routes used in previous years. Survey stops should be at 150-200 meter intervals unless local conditions warrant a different distance. Make sure the route and all stops are clearly recorded on the survey map.

5. Arrive at the survey location to begin surveying about 30 minutes before sunrise. Surveys should continue no later than 3 hours after sunrise. No evening surveys should be conducted for the official survey.

6. Upon reaching the location, fill in the weather information section of the cover sheet. If the wind speed is greater than 10 mph (a breeze that keeps leaves and small twigs in constant motion or extends a light flag), do not conduct official surveys. Responses to the calls are difficult to hear over the rustling of marsh vegetation.

7. For the survey, get as close to the marsh vegetation as possible at each stop. Note the time in the "time start" column. Wait quietly for one minute to listen for rails. Then play the tape, directing the speaker toward the marsh and at approximately 80 decibels volume. At each stop, play the tape for 2 minutes, turn it off for 2 minutes, turn it on for 2 minutes and turn it off then listen for one minute (total survey time 7 minutes). Keep to the 2 minute intervals as carefully as possible. Listen for rail responses during the entire period and record responses on the data sheet.

8. Record responses from each rail on a different line. If you do see/hear a pair, record the individuals separately and check the "was rail paired" column. All rails seen or heard at stops during the survey are to be counted. If you hear the same rail twice, only count it as one bird. Rails heard or seen at other times while on site during the survey are incidental and are recorded at the bottom of the data sheet. Since some observers are interested in other species, there is a column to record other species of birds observed during the survey on the data sheet.

9. After the survey has been completed, record on the cover sheet any events or disturbances that may have affected the survey results (other loud birds, boat or vehicle noise, etc.). Also, record the weather conditions. Make any other notes of observations of other species (as appropriate).

10. Please make sure the cover and data sheets are clearly filled out. The information can be used to define rails/station (all rails seen/heard), rails/stop (rails seen/heard at each stop or an average) and rails/hour (each stop has 7 minutes of survey time) after the surveys have been completed. The official survey will continue to look at rails per station.

11. Completed reports are due to AESO by July 1 of the survey year. Reports will include cover and data sheets and a map showing the survey route. Send completed survey forms and maps to:

    Yuma Clapper Rail Coordinator
    USFWS-AESO
    2321 W. Royal Palm Rd. Suite 103
    Phoenix, Arizona 85021
    602/640-2720 FAX 602/640-2730

Attachment D

CHRONOLOGY OF THE IMPERIAL IRRIGATION DISTRICT WATER TRANSFER AND ENDANGERED SPECIES ACT COMPLIANCE

The Agreement between Imperial Irrigation District (IID) and San Diego County Water Authority (SDCWA) for the transfer of up to 300,000 acre-feet of water per year was signed by those agencies in **April of 1998.**

The Fish and Wildlife Service (Service) initially met with the Bureau of Reclamation (Bureau), IID and SDCWA to discuss the transfer on **January 6, 1999.** This initial meeting was the introduction to the proposed project for the Service.

A second meeting occurred on **February 19, 1999**, which focused on the issues of Endangered Species Act (ESA) compliance through section 7 versus section 10, direct and indirect impacts in the Imperial Valley and San Diego County, and the California 4.4 Plan. The assurances associated with section 10 were important to IID given the term of the agreement (45 years with an option to extend another 30 years) and the potential need for participants to secure loans.

The Notice of Preparation (NOP)/Notice of Intent (NOI) to prepare an Environmental Impact Report(EIR)/ Environmental Impact Statement (EIS) on the water transfer project was published **September 24, 1999.**

Staff from the Service attended the **October 19, 1999** scoping meeting, one of a series of meetings conducted during the comment period on the NOP/NOI.

On **December 7, 1999,** the Service began regular meetings with the Bureau, IID and SDCWA to begin the development of the Habitat Conservation Plan (HCP) to address all impacts within the Imperial Valley, the Salton Sea, and along the All-American Canal. The lower Colorado River species were also discussed. This first meeting was somewhat organizational; it focused on the roles and responsibilities, schedule, scope, coordination, and the status of the Salton Sea Restoration Project and Lower Colorado River Multi-Species Conservation Plan. A brief presentation was provided on the San Diego County Water Authority's receiving area and the potential for impacts there.

The second regular meeting on **February 3, 2000** centered on the ESA compliance approach for the transfer project and how that tied in with the Lower Colorado River Multi-Species Conservation Plan. The Quantification Agreement and its compliance schedule was also discussed. An outline of the HCP and an initial species list were also provided at that meeting. **This initial list included 21 species.** The consultant (CH2MHill) walked the group through how their process of elimination was conducted to get down to that list.

The **March 8, 2000** meeting included discussions of the HCP National Environmental Policy Act (NEPA) requirements as compared to the requirements of the project overall and how a single

document could address both. The Bureau of Reclamation agreed to send a letter inviting the Service to be a cooperating agency on the EIS so this need can be met. A supplemental NOI will be required prior to releasing the draft document to inform the public that this is the approach being taken. The major tasks required in completing the process were laid out. New maps supported a discussion of the regional setting and HCP area. Indirect effects in receiving areas were discussed, and SDCWA stated that Metropolitan Water District (MWD) would be providing a white paper on the issue March 13. The final discussion of the meeting centered on the covered species list. This meeting, in combination with a follow up conference call on March 9, resulted in further refinement of the covered species list. **At that point seven species were definitely on the covered species list, 12 were still being considered, and two species were to be dropped from the list.**

On **March 27, 2000,** the Service received a call from IID's consultant informing us the IID wanted to keep all of the potentially sensitive species that had been identified within the HCP project area. They were in the process of weighing the costs of coverage versus the risks of no coverage for each species. At that time they were developing the covered activities list, firming up the project area boundary, and beginning their evaluations of potential impacts and mitigation measures.

The meeting on **April 12, 2000** included a review of the HCP area which includes the IID service area and the All-American Canal corridor. The 100 year flood plain of the Colorado River was excluded because it was covered in the Lower Colorado River Multiple Species Conservation Plan. The canal lining is covered under a separate consultation, but this coverage would include operational and maintenance activities. The covered activities list (attached) was provided to the group (this included 18 general activities grouped into four categories). This covered essentially all IID activities. We discussed the third party activities and the need to limit that to water conveyance/conservation activities. **A revised species list was provided which included 60 species (10 federally listed or proposed).** The Service raised concerns that such an extensive list would be difficult to address in the given time frame. IID's concerns focused on their 75 year commitment with the water transfer and the resulting broad coverage that their commitment requires. The group was also presented with the conceptual approach for mitigation in the HCP. The primary mitigation suggested was wetland creation that will address the broadest suite of species. The basic concept is to measure mitigation by area rather than number of individuals of the species to be addressed. IID has not provided a detailed proposal of how they will address the temporal loss of habitat in the Salton Sea that will occur with the project. These changes are expected to be significant, however, based on the model prepared by the Bureau of Reclamation for the Salton Sea Restoration Project. Under current inflow conditions, the Salton Sea's salinity in the year 2030 is expected to be on the order of 53,000 mg/L. Under the reduced inflow, the salinity in 2030 is expected to be approximately 75,000 mg/L. Elevation is also expected to differ. The Sea's elevation under current inflows is expected to be approximately -224 feet mean sea level in 2030. Under reduced inflows, the elevation is expected to be approximately -234 feet mean sea level. The change in salinity is expected to result in changes in the Salton Sea's fauna (including the loss of the fishery that currently supports fish-eating birds) on a much more

accelerated rate as compared to the current inflow conditions. The final action item to come out of the meeting was that a draft NOI would be prepared by Washington, DC and California Solicitors' Office staffs.

The meeting on **May 10, 2000**, began with a discussion of the area to be discussed in the EIR/EIS versus the HCP. The EIR/EIS will cover the area to the edge of the 100 year flood plain (the edge of the Lower Colorado River Multiple Species Conservation Plan area). The HCP, on the other hand, will extend up into the flood plain to the discharge from the desilting basins to cover IID operational and maintenance activities in the area. The Lower Colorado River Multiple Species Conservation Plan and EIS will cover the federal action (i.e., change in point of diversion) within this area. This change in coverage area will require the additional coverage of lower Colorado River species. Tables were sent to the group in advance of the meeting (received May 5 via e-mail) that included a preliminary evaluation of the potential impacts to covered species and possible mitigation to address those impacts. These were very conceptual and needed to be related to specific covered activities. The difficulties of dealing with species with little site specific information were discussed, and an adaptive management approach was suggested by the consultant. We discussed the difficulties of evaluating the potential for jeopardy and developing terms and conditions in these circumstances. The Service offered the option of a phased approach to the HCP to allow for coverage of the listed species and any other "high risk" species in the current time frame and addition of species through amendments. IID reiterated concerns associated with their long term commitment. More detailed species accounts, more detailed activities descriptions, and a framework for the HCP were the next items to be distributed to the group.

On **May 12, 2000,** the Service submitted our acceptance of the cooperating agency designation to the Bureau of Reclamation.

An initial set of species descriptions (incomplete) was provided in advance (e-mail sent June 7) of the **June 14, 2000.** That meeting began with a presentation by IID staff on the hydrological model that is being developed for the Imperial Valley. The model will be used to predict the outcomes of a variety of possible conservation scenarios which will then be evaluated for species impacts. It will also serve as a means to determine compliance with IID's 3.1 million acre-feet/year cap included in the Quantification Settlement Agreement (QSA). The appropriate scale for evaluation of the model output/impacts was determined to be on the basis of "drainsheds" rather than individual drains or valley-wide. The discussion turned to the issue of additional coverage within the flood plain of the Colorado River and why that was needed. It relates back to the length of IID's commitment and the desire to have assurances associated with all HCP species coverage. **This coverage necessitates the addition of 29 species to the covered species list (two federally listed).** This complicates further the task of completing the HCP within the needed time frame. The NOI will have to address these species as well.

At the **July 24, 2000** meeting the Service was presented with an expanded description of the proposed covered activities and a draft document describing the conceptual approach for the

Multi-Species Conservation Plan. The packet included an analysis of effects of the covered activities for the first of the eight species groupings being proposed. There was preliminary agreement that the overall approach was a useful organizational tool, but it was pointed out that we can't lose sight of individual species' needs in the process. A formal presentation was made of the categories of mitigation that IID is proposing to address impacts to the covered species which have now been grouped based on habitat use. Deep water ponds, managed marsh, and "on-channel" ponds were identified as the primary types of created habitats they are considering. The scale of individual sites was provided, but no quantification of the valley-wide needs had been developed. The California Department of Fish and Game raised concerns about the impacts to the sport fishery and the need to address that in the EIR/EIS. The Service agreed to provide additional comments on the documents received at this meeting, the documents to arrive shortly, and the species accounts at or before the next scheduled meeting.

On **August 1, 2000,** the Service received the analysis of effects of the covered activities for the remaining seven of the eight species groupings being proposed in the HCP approach and a tabular matrix of the effects of the covered activities by species groups and subgroups from IID's consultant.

The Service's draft comments on the following documents were distributed at the beginning of the **August 9, 2000** conference call: the covered activities descriptions, the HCP approach document including all species groupings, the effects matrix, and the species descriptions provided to the Service to date. The conference call began with a walk through of the major comments on each of those documents. All individual comments could not be addressed, but the Service offered to provide additional information/clarification as needed. Major comments included the need for greater clarification to connect the individual covered activities included with the requirements of the water transfer/quantification cap. **The need to address the QSA cap was stressed by IID as a new aspect of the scope of the HCP.** The use of a habitat based approach does make evaluation for the internal section 7 on permit issuance and the permitting process in general more difficult. The permit still has to be done in the context of each species' status. The next steps involve quantifying the impacts and determining the extent of the required mitigation. It was agreed that the marsh group and the desert pupfish would be the first to undergo this analysis. It was reiterated that the analysis can be conducted by group, but we must be able to be sure that our approach is adequate on an individual species basis. The species accounts provided require additional detail on project area habitat and project area occurrence in order to accomplish this task. The Service offered to provide copies of examples that have been appropriate in other HCP's. The discussion then focused on system versus on-farm water conservation measures and the potential role of fallowing. The model being developed should allow the potential extremes and the likely impacts to be identified so that the mitigation can be appropriately scaled. The consultant's intention is to look at most likely impacts, but they will also look at contingencies to address the worst case scenario. **Final concerns were that the NOI needs to be published as soon as possible, and the Service will need time to review the EIS before it is published (the current schedule calls for publication in September) given it has to address our NEPA**

requirements as well. The September meeting was canceled as a result of several schedule conflicts.

On **August 15, 2000,** the Service requested an update on the schedule for the EIS and the HCP. As of **August 29, 2000,** no updated schedule could be provided.

On **September 13, 2000,** the Service received notification from IID that they would not be able to meet the January 19, 2001 target date set by the Secretary of the Interior. At that time we were informed that the internal review draft of the EIR/EIS should be ready in the first part of November along with a first draft of the HCP. IID indicated that they should be ready to submit the HCP to the resource agencies by the end of November or first of December. They suggested a tour of possible mitigation sites at that point because they would have a better understanding of what they would be proposing. This was tentatively scheduled for late October/early November. The model peer review teem was being set up and their meeting schedule was to be determined at a meeting on September 18. The Service nominated Tim Mayer from the Regional Office. **We were informed at that time that the IID would not require any further meetings with the resource agencies until the submittal of their HCP.**

On **October 27, 2000,** we were informed by Bruce Ellis of the Bureau of Reclamation that they had a meeting scheduled with IID to exchange draft documents. The Bureau was to share a copy of their programmatic Environmental Assessment on the Secretarial Implementation Agreements and IID was to have the Draft EIR/EIS for the transfer for the Bureau. Carol Roberts contacted Steve Knell on **October 31** to see if it would be possible for the Service to be represented at that meeting as a cooperator on the EIS. She was informed that the meeting was for the lead agencies only. A separate e-mail was also received on that date indicating that the model presentation was going to be delayed as a result of the need to complete the HCP and EIR/EIS documents. Bruce Ellis informed Carol Roberts on **November 13** that the Bureau had not yet received a draft of the transfer EIR/EIS as IID had concluded that they needed to complete the HCP first. They were focusing their efforts on completion of that document first so that it could be addressed appropriately in the EIR/EIS.

On **November 6, 2000**, an amended Notice of Intent was published by the Bureau in the Federal Register to address coverage of permit issuance in the draft EIR/EIS. A thirty day comment period followed during which the Service received three comment letters. Two raised concerns about the indirect effects in the receiving areas, and the third requested that tribal trust resources be addressed in the document.

The tour of the Imperial Valley occurred on **December 1, 2000,** with Carol Roberts and Nancy Gilbert attending for the Service. Also in attendance were Kim Nicol, Teresa Newkirk, and Sharon Keeney from the California Department of Fish and Game. The focus of the tour was the nature of IID operations around the valley with stops to observe things like surface and subsurface drain operations, drain maintenance, dikes along the south end of the Salton Sea, and

lateral interceptors/reservoirs constructed as part of the previous transfer to MWD. A stop was made at the Imperial site of the Brawley Wetlands project to show one type of habitat that could be created. There was also a stop at one of the local duck clubs receiving drain water. The group discussed possible measures to avoid impacts to burrowing owls using drains or canals. No specific mitigation sites were identified, but the plan will mitigate for losses of habitat resulting from drain maintenance and degradation of water quality. The consultant also identified tamarisk stands around the Salton Sea shoreline as likely to be lost as the Sea recedes. These will be mitigated with plantings of native cottonwoods, willows and mesquite trees. **At the conclusion of the tour, the Service was informed that the draft HCP should be available sometime between December 18, 2000 and the first week of January 2001.**

On **January 2, 2001,** the Imperial Valley Press ran a story on the water transfer that stated that the IID would begin their negotiations with the Service by **January 15th.** In response the Service requested an update on the schedule on **January 9, 2001** via e-mail. The response received from IID on **January 13th** was that they were in the process of coordinating with the other parties to the QSA (Coachella Valley Water District (CVWD) and MWD), and IID was hopeful that the coordination would be completed shortly. They provided **late February** as the soonest the HCP would be submitted to the Service.

On **January 12, 2001,** the Service's Phoenix Fish and Wildlife Office issued their biological opinion to the Bureau on the Interim Surplus Criteria and the Secretarial Implementation Agreements. This document provides incidental take to the Bureau for their actions on the lower Colorado River that are required to implement the water transfer as part of the California 4.4 Plan. Indirect effects of the transfer in receiving areas were discussed in the document. Incidental take has already been provided in some areas through regional HCPs. Incidental take in areas not covered by regional HCPs was deferred to coverage as future projects are developed.

On **March 5, 2001,** a meeting was held at the California-Nevada Operations Office (CNO) to discuss the IID HCP. The meeting was called by the Bureau's Regional Director for the Lower Colorado River Region. In attendance were: the CNO, Carlsbad Fish and Wildlife Office, and the Sonny Bono Salton Sea National Wildlife Refuge (NWR) for the Service; the Bureau's Lower Colorado River Regional Office; IID, their attorney and CH2MHill; CVWD; MWD; SDCWA; and the California Department of Water Resources. The importance of completing this permitting process in a timely fashion was stressed by all the water agencies present. This water transfer project is considered to be the key to the California 4.4 Plan. A presentation was provided that gave an overview of the project and the HCP that is being developed. The HCP is a habitat-based HCP. The Service pointed out that the HCP will still need to assure that all individual species are adequately addressed if they are to be covered by the permit. The covered activities are to include only those associated with water use activities. General farming activities are no longer included. A list of the habitats to be addressed was provided along with basic information regarding the mitigation. The IID emphasized that the Salton Sea was undergoing changes and that they believe that the transfer project is not responsible for restoration of the Salton Sea. They support restoration, and will contribute towards the efforts, but in the absence of a larger restoration effort

they will implement enhancements in areas focused around the river deltas only. Off-site enhancements for piscivorous birds will also be considered. State and Federal support will be sought to assist with the implementation of these efforts. No alternatives that result in reductions in crop yields (i.e., no fallowing) are to be included in the alternatives as this is deemed unacceptable politically.

The schedule for the project was provided by IID as follows:

March 20, 2001 - draft HCP is provided to the Service and the California Department of Fish and Game (CDFG)

HCP negotiations to be complete in **30-45 days** (if possible)

Draft EIR/EIS in **late June or early July, 2001** (impacts of permit issuance are to be addressed to meet the Service's NEPA requirements)

Final EIR/EIS around **Thanksgiving 2001**

Permit Issuance in 2002 (by January if possible, but at least in time for farmers to sign up for the water conservation program before the summer irrigation season)

Water flowing to SDCWA in 2002.

All agreed that this was a very ambitious schedule.

On **March 20, 2001,** we met in Carlsbad with the IID HCP team. Copies of the document had been provided to the Service and CDFG one week prior to the meeting. IID provided a computer presentation on the basics of the HCP approach. This HCP is intended to address not only the IID-SDCWA conservation and transfer project, but the QSA cap as well. It is a habitat-based approach with the goal of maintaining habitat quantity and quality. Salton Sea restoration is considered an independent activity. IID is offering some "stand-alone" projects to address impacts to Salton Sea species should the larger restoration effort not move forward. Tamarisk scrub issues are tied into what occurs at the Salton Sea because most of this habitat is in shoreline areas. The drain and desert habitats as well as the individual species to be addressed were also discussed. CDFG raised concerns over the use of the 2081 permit to cover unlisted species. IID stated that they were assured from the highest levels in the agency that this need could be accommodated. The Service again raised the concern that there is not adequate time to maintain the current covered species list, and we recommended that our efforts be focused on those species for which there is adequate information to issue a permit. IID countered that their Board is not willing to take on the risk of a new species listing after the project begins. They expressed the desire to work through the individual categories to see if the issues can be resolved before making any decisions on dropping species from the list. We discussed the "flagship species" such as the burrowing owl and the desert pupfish and how outside expertise may be needed to address these species. We briefly discussed the agricultural field species and the lack of mitigation for these species. IID stated that they felt that adequate mitigation was provided by the fact that the transfer project would allow agriculture to continue in the Imperial Valley indefinitely thus providing long-term habitat. Without the transfer, the longevity of agriculture in the valley could not be assured. Lastly, we discussed the monitoring and adaptive management approach. Currently, the program is not adequate to provide for an adaptive management scheme and to support permitting. The frequency of surveys and the specificity of optional management actions

will have to be improved greatly before permitting will be possible. We scheduled the topic for the next meeting (drain habitat) and adjourned.

The group met again on **April 2-3, 2001**. We started the discussion with an evaluation of the representativeness of the drains studied in the Hurlbert (1997) study. These drains were chosen for other purposes, so we were looking for some verification that they represent the range of drain types occurring in the Imperial Valley. Seven characteristics were identified to be considered in a statistical evaluation of the drains: total dissolved solids, water slope, side slope, main vs. lateral drain, flow (where available), date of last cleaning (of the Hurlbert drains), and water use history. If these drains are reasonably representative, we will use the vegetation analysis in the Hurlbert study. If not, additional surveys in the future would be needed to determine the actual amount of mitigation that is needed for drain related activities. We also discussed the 14' width and determined that its use was acceptable. However, additional diagrams and information will be added to the document to support its use.

Operations and maintenance topics were discussed. Much more specificity is needed in these discussions to provide some cap on the amount of take that would be associated with these activities. Herbicide use is problematic, and the Service will pursue the best means of addressing this issue in the permit (if it is possible). Nothing in the plan addresses habitat loss associated with the change in land use on leased lands. IID is concerned about taking on responsibility for the actions of lessees, but the Service sees this as a potentially significant unmitigated impact. Further discussion will be required on this issue. Construction projects were also too open-ended in regards to take. The contractor agreed to try to re-work this section to make it more clear what the nature of the construction projects will be and what categories they envision as requiring some mitigation. Again, some kind of cap is needed on the potential take. The rails and the least bitterns are driving the mitigation in this group. It was decided that this may not adequately address some of the other species. Also, there seem to be opportunities for avoidance that were not being incorporated into the plan. IID will look at worker education and leaving some vegetation standing when dredging drains as possible avoidance measures. Frogs may receive special mitigation including re-introduction so that a demonstrable benefit could be assured. Some species were moved to other groups. The transients are problematic because it is difficult to establish the take and the benefits of mitigation. Rob Thornton will be providing examples of how these species were addressed in other HCPs. Adjacent wetlands were discussed along with how the monitoring and replacement of these wetlands could be improved, including a focus on maintaining rather than replacing. We concluded with identifying the action items and the topics for the next meeting (pupfish, agriculture related species, and desert species).

On **April 11 and 12, 2001,** we met to discuss the desert pupfish, desert issues and agriculture related issues. We started with a couple of items carried over from the last meeting. Jim Setmire of the U.S. Geological Survey was contacted for additional information on the choice of drains in the Drain Report. He identified flow, soil type and selenium concentrations as the factors he evaluated in choosing drains. He attempted to represent the range of those characteristics in the study. This information was helpful, but the evaluation discussed at the last meeting would

provide a more thorough documentation of the representativeness of the "Hurlbert" drains. Pesticide coverage was strongly discouraged by the Service's Regional Office given the complexity of the impacts and gaps in data to evaluate impacts. The issue is still open, but coverage would have to be based on use of a very limited range of chemicals, and the analysis would have to address the range of potential impacts that could occur in the species potentially exposed. This would be a significant workload issue for the Service.

The desert pupfish was discussed in order of the items in the conservation program. The first issue of concern was limiting the number of drains considered based on the ability to pick this species up in a survey in the last 5 years. Given the sporadic appearance of this species in some of the drains, this approach was not acceptable. A more justifiable approach is to consider all drains that flow directly into the Sea to be habitat and gear the conservation program accordingly. Avoidance and minimization measures to be carried out as part of the maintenance of these drains need to be incorporated into the program. Maintenance dredging will be conducted at most once per year on the center of the drain leaving the edge vegetation in tact. If that is not feasible due to the width of the drain, only one half of the drain will be dredged in any one year. The appropriate approach needs to be determined in advance and incorporated into the worker education program. The maintenance will also be done in a downstream direction. Exceptions will be identified in advance, and other means will be considered to avoid impacts associated with moving in an upstream direction. The test channel concepts offers some viable opportunities for studying management options. However, the proposal may require a longer time frame to see results, may require more active management to achieve colonization, and may require additional funds to complete these efforts. CH2MHill will try to provide greater detail in regards to what is planned. Time frame is important as we will want access to the information generated before we are too far into the permit period. We also identified the need for a formal concurrence process between IID and the agencies before changes to the program are implemented. We also discussed the possible problems associated with Salton Sea elevation decreases and the possible need to contour channels or recreate shoreline pools. Water quality is a problematic issue given that we currently have no framework for determining the amount of mitigation that is needed. Three constructed channels with operational discharges were offered as a starting point, but we need a better understanding of the impacts to know if this is adequate. CH2MHill will provide model outputs for these drains for evaluation. Other mitigation sites could be used for re-introduction of pupfish to help offset habitat impacts in the drains. For construction projects the goal is one of no net loss. An accounting system will have to be laid out in the HCP with a ledger for potential habitat gains (possibly as a result of lengthening of the drains with drops in Sea elevation) and losses. The last topic we discussed was the possibility that the Salton Sea may become inhospitable to pupfish sooner as a result of the project than would otherwise occur and that this would need to be addressed in the absence of a larger restoration project.

The discussion of desert habitat started with a request to better represent the area being discussed including discussion of the desert interfaces along the East Highline and Westside Main canals (in addition to the All-American Canal). We need some contingencies for emergency repairs to be incorporated into the HCP given that earthquakes, tropical storms, and other natural events are

likely within the life of the permit. We need to incorporate the basics of the worker education program into the HCP, although the specific locations will not be available until surveys are completed. Plant surveys should be conducted when the appropriate meteorological conditions occur rather than on a set schedule. CDFG will develop triggers for initiation of the surveys. Baseline will require a minimum of 2 years of surveys in the right conditions. CDFG stated that they do not conduct salvage and do not consider salvage to be mitigation for covered plant species losses. Permanent preservation will be required. Weed invasion will also have to be evaluated based on current conditions and monitored in the future. Animal surveys will also need to be modified to incorporate a meteorological component. Surveys should be conducted in a stratified random fashion focused on the appropriate habitat for each species. A variety of survey methods will need to be incorporated to pick up the entire suite of species. The list of desert animal species should also include the burrowing owl. The conservation program also needs to include all of the standard avoidance/minimization procedures for the desert species. The agencies will provide a list to CH2MHill. Again, there will need to be a process for reaching agreement on modifications to the program, and a mechanism to deal with cases in which the agencies and the applicant cannot agree. Additional language will be provided to support this need. When preservation is required to mitigate impacts, this must include adequate funding to provide for the management of those lands in perpetuity. IID has the option of purchasing the lands and managing them, or turning them over to land management entity with an endowment to provide funding for management. IID also has the option to restore temporary impacts (to be initiated within 12 months), or to mitigate those losses as permanent.

The agricultural land habitat does not include coverage for farmers' general activities. IID feels that crop changes in response to the need for water conservation are unlikely as these changes are likely to remain market driven. IID is also not planning to pay farmers to fallow their land, so impacts from this should not be considered part of the project. However, they are looking for coverage of fallowing on their lands, and they are evaluating fallowing as a means of water conservation in the EIS/EIR. IID decided that further internal discussion was necessary as they may want to cover fallowing in general. Whether or not fallowing or crop changes are subsidized as part of the program, they do appear to be a possible outcome of the conservation program/cap during the life of the program and should be considered. We need to have more detailed information on all the activities to be covered and how these may impact the covered species.

The last topic discussed was the razorback sucker. IID is relying on the operations biological opinion for coverage of entrainment in the short-term, and the Multi-Species Conservation Plan will provide coverage in the long-term. The MSCP approach is to develop enough habitat that fish reproduction will be adequate to support losses to dams or entrainment. They water agencies do not want to maintain screens. Although the impression was that fish found in the canals were already considered to be "taken", a review of the biological opinion revealed that the incidental take statement specifically excludes live fish from the take. These fish are to be dealt with via a protocol to be defined by the Service. The CDFG has a protocol that has been used in the past. This species is fully protected by the State, and cannot be taken. This will need to be resolved.

On **April 20, 2001,** IID provided a presentation on their hydrological model for the Imperial Valley. The Colorado River model produced by the Bureau of Reclamation provides the input, and the output of this model can be entered into the Bureau's model for the Salton Sea. All water entering the system leaves through one of the outputs identified by the model. The focus is on consumptive use versus what flows into the drains, rivers and the Salton Sea. IID has very good data on which to model deliveries. Measurements have been made at all delivery points. The drains are not as well understood because there are only a few points that have had any measurements over time. The focus of the model design was the period from 1987 to 1998 as detailed data was available for water use and cropping patterns. Based on testing against historical data, the model predicts total flows to the Salton Sea, flows to the New River and flows to the Alamo River well. Flows in the drains that flow directly into the Sea are not captured as well in the model. Future cropping patterns are assumed to be similar to today. Water conservation is assumed to be achieved by physical means that do not include fallowing or crop changes. The average performance improvement in water conservation was 30%. The on-farm conservation drives the model. However, system changes do tend to have a greater effect on concentrations of individual constituents (e.g., selenium). The model has incorporated parameters to address changes in total dissolved solids, selenium, and boron along with some constituents that are (or were) applied on the farms (DDTs, toxaphene, chlorpyrifos, nitrogen and phosphorus). The model did not identify a relationship between soil type and concentration of the modeled constituents. What was found was a relationship (inverse) between flows and concentrations of trace elements. The model is based on mean concentrations. Although this was not deemed to be an issue for selenium, it could be a concern for chlorpyrifos and nitrogen (specifically that in the form of unionized ammonia). IID felt that applications of pesticides and fertilizers are likely to go down with water conservation. Overall, the presentation was very helpful.

The meeting on **April 27, 2001,** was focused on the drain water quality and the approach taken to develop mitigation. We started the meeting by reviewing the assignments still pending in the HCP revision. Many issues remain to be resolved in terms of the role of fallowing and what will be addressed as unforeseen circumstances. In order to facilitate the discussion of water quality, Harry Ohlendorf of CH2MHill and Joe Skorupa of the Sacramento Fish and Wildlife Office participated in person and by phone, respectively. Joe had several questions which we discussed in the order that they were presented in the document. The major concerns he raised were:

- The use of 5 µg/L Se or the concentration in the incoming water, whichever is greater as a criterion for the water quality in the created marshes presents two major problems. The level of 5 µg/L Se may not be adequately protective of wildlife and is being evaluated by the Environmental Protection Agency. This concentration as a water quality criterion in the California Toxics Rule constituted a jeopardy for the California clapper rail. Similar concerns exist for the Yuma clapper rail. The other concern is that this does not present an upper limit on the Se concentration. IID was concerned that they might be limited in terms of the concentration of the incoming water from the Colorado River. While this concern is justified, it does not change the fact that we need to be able to analyze the

impacts of the HCP and determine if mitigation is adequate. This cannot be done if water of adequate quality cannot be assured for mitigation habitat. A concentration of 5 µg/L Se is only acceptable with substantial monitoring for wildlife impacts. A concentration of 2 µg/L Se is preferable. Given the scale of the mitigation, pre-treatment to this level should be feasible. IID was concerned about making a commitment to treating to this concentration given that the concentrations in the Colorado River could not be assured.

- Impacts other than hatchability have not been addressed. Other things that should be considered are post-hatch effects, immune suppression, and body condition.
- The applicability of the formula to this situation needs to consider that the relationship was developed for ponds which had reached an Se equilibrium and were very stable in terms of Se concentrations. Although this is probably the best basis we have, the conditions in the valley are going to be much more variable. If the invertebrate concentrations in relation to the water concentrations are similar to those found in the ponds where this was developed, it is reasonable to use this approach in the Imperial Valley.
- Because this relationship was developed for stilts, it may not be appropriate for the covered/listed species if they are more sensitive. It would be prudent to look at the relative sensitivities of different species provided in the literature to determine if a safety factor is needed.
- The use of a percentage of habitat for mitigation may not adequately address potential accumulative effects (i.e., it assumes zero additive effects over time). Specifically, the demographic assimilative capacity of the population has to be able to tolerate this potential loss over the term of the permit. The most protective approach is to mitigate 100% where there is an impact, thus addressing the entire drain population. An alternative is the use of a safety factor and include a higher acreage of mitigation. This could be scaled back if monitoring indicates that less is required to achieve the same goal. Otherwise, a mechanism is needed to add to the mitigation if the monitoring indicates such additive effects may be occurring.
- It is not clear what opportunities we have to promote recovery within the HCP. For some species we are dealing with a significant portion of the range, and this is an important consideration. The HCP should not preclude and should contribute to recovery. IID does not feel that they have a responsibility to recover species, but they acknowledged that the wording in the document could be improved.
- A basis for the acceptable numbers being within 25% of the baseline surveys should be provided.
- Overall, Joe recommended taking a conservative approach and designing mitigation around the worst case. This is the best way to determine long-term costs up front. IID was concerned that the use of worst case, while providing for a maximum long-term budget, would ultimately be a deal breaker as the costs would run too high. Given that the chance of needing additions in mitigation above the current planning for most likely impacts is high (Joe estimated 50% relative to the contaminants impacts), the current burden on the Service for addressing those changes appears to be too high.

Some additional comments were provided by the Service including the fact that covered species use of open water in the drains was not addressed. Also, the language discussing the mitigation ratio is inappropriate given that we are using a probabilistic multiplier. CH2MHill agreed to reconsider that language. We scheduled the topics for our next meeting and adjourned.

On **May 8, 2001**, the group re-convened to discuss issues related to burrowing owls and bats. CDFG was concerned that the proposed strategy does not incorporate their protocol for addressing burrowing owls. Strategy Owl-2 was of particular concern because of the reliance on the operators for locating burrows. There are several specific requirements of their protocol that IID felt would impact their ability to maintain their operations. CDFG will confer internally to see what flexibility they have to deviate from the protocol in an approved HCP. IID emphasized that they must be able to address drain flow problems, although they do have some flexibility to modify their techniques to minimize the likelihood of impacts to owl burrows. This is important given that they are moving in a direction of only doing maintenance where there is a specific request to do so to minimize impacts of the cleaning operations valley-wide. The Service recommended that they consider addressing the two groups of owls that are present in the Imperial Valley. There are breeding birds for which protection of the occupied burrow complex is paramount, and there is an influx of birds during the winter whose use of burrows is more variable providing greater flexibility. "Fallback" of dredged material into the burrows was identified as the most likely impact. IID felt that this could be avoided by having excavator operators modify their movement patterns around burrows. A worker education program would be needed to implement this aspect of the HCP. The approach that was recommended is to have a full time biological monitor that will be charged with conducting breeding season surveys that will be focused on areas IID expects to be cleaning that year. The monitor would survey and mark burrows so that they can be avoided by operators. IID offered to have operators drive by the drain to be cleaned on the side opposite of the equipment movement path to maximize the chance of identifying burrows that need avoiding. The Service recommended providing burrows the maximum buffer allowed by the equipment. All agreed that we would like to maximize avoidance of burrow impacts, but we are looking to ultimately sustain a population of burrowing owls in the Imperial Valley. This will require an adequate level of monitoring including surveys and banding to obtain a better understanding of how burrowing owls use the Imperial Valley. In addition, we need to lay out adaptive management options as part of the HCP to address any shortfalls in the proposed strategy. Possibilities include the addition of artificial burrows in areas where these may be limiting, a change in maintenance practices, or changes in land use on IID land to promote burrowing owls. Additional aspects that IID needs to consider include: canal maintenance can also impact owls and needs to be addressed, a farmer education program may provide benefits to the owls in areas that are outside their jurisdiction, and they need to consider the owl's generation time when developing the monitoring program (it takes 6 years to get to a sample size of 1 in terms of the population). In addressing the construction impacts, a 2:1 ratio of replacing each impacted burrow (or 5:1 or greater on a per pair basis) was deemed acceptable. The potential impacts of these projects needs to be quantified (at least a cap). IID felt comfortable that construction activities could be scheduled outside the breeding season. Emergencies will be dealt with elsewhere in the plan.

Bats are very difficult to address because there is so little information. The Service is in a difficult position because we can't define what we would be permitting. IID needs to conduct the appropriate studies to lay out how the bats proposed for coverage use the HCP area, and they need to provide an evaluation of the impacts of IID's activities. This requires a better definition of the covered activities. The HCP also needs to incorporate a system of checks and balances to identify what will be done for each potential conclusion that comes out of the studies. IID needs to understand what costs are associated with this process before they are willing to approach the Board with the possibility of removing bats from the covered species list. We discussed the possibility of some sort of conditional coverage, but this has been problematic in other HCPs. It would be better to either remove them from the list or commit to the appropriate actions to justify coverage. IID should investigate if there are opportunities to include a pro-active approach whereby they would incorporate actions that would benefit the bat species within or in the vicinity of the HCP area such that a stronger argument could be made that coverage is justified. The bats also need to be addressed on a species specific basis as some species needs are different from others. The group agreed to the following approach to address bat coverage: CDFG will work with CH2MHill to identify a list of bat experts in California. CH2MHill will organize a "bat summit" at which the experts would come together to discuss the best way to address bats in the HCP. In preparation for that meeting, CH2MHill will develop a better defined list of activities that could impact bats and a list of potential interim measures that could benefit the species while a study is conducted to assess bat use of the Imperial Valley and better define the potential impacts of IID's activities. The experts would be tapped for input on the interim measures and study design to meet the needs of the HCP.

On **May 14, 2001**, IID hosted a tour of several drains to discuss surveying the drain system vegetation. CH2MHill decided to complete a survey rather than taking the time to further evaluate the "Hurlbert drains" when the outcome was likely to indicate they weren't representative of the drains as a whole. Staff from the Carlsbad Fish and Wildlife Office, the Sonny Bono Salton Sea National Wildlife Refuge and the CDFG were in attendance. CH2MHill is committed to surveying all 1,400+ miles of maintained drains. This will include spillways that are maintained for storm run-off as well as the irrigation drains. Some areas that function to allow drain water to pass through them but are not maintained will not be surveyed. However, these areas should be discussed in terms of what emergency actions may be required in these areas, what impacts could result, and how these impacts will be addressed. The surveys will be conducted by segments as determined by the lay out of the drain. Within each segment the width of the vegetated portion will be estimated less the open water. If there is an obvious demarcation or difference in vegetation between the wetted portion of the drains and the banks, these will be totaled separately. The California Native Plant Society relative abundance categories will be used, and an effort will be made to have totals add up to 100%. The following vegetation categories were identified: bare ground, herbaceous ground cover, salt cedar, cattail, bulrush, common reed, arroweed, docket, salt bush, willow, mesquite, and sedge. The surveyors will not be looking at vegetation height. Vegetation width will be recorded as horizontal width for two reasons: to facilitate the survey process and to allow for the use of aerial photographs should some areas not be accessible. This was deemed acceptable given that the mitigation habitat will be of better

quality to offset estimates that reduce the quantity. Dead or dormant vegetation (except ground cover) will be counted and its condition noted. It was agreed that by surveying the entire drain system, all stages of maintenance should be covered.

The group had originally scheduled a meeting on June 7 and 8, 2001. This was later re-scheduled to **June 5th** to better accommodate the resource agencies' schedules, but **was cancelled by IID** on May 29th to allow CH2MHill more time to prepare document revisions. This revisions were scheduled to be provided to the Service and Fish and Game by close of business on June 1st. The **revised covered activities text was provided** by Sandy Taylor of CH2MHill **on June 4th** via electronic mail, and the **revised desert pupfish strategy was provided** by David Christophel (also of CH2MHill) **on June 13th** via electronic mail.

Our next meeting occurred on schedule on **June 15, 2001.** The agenda included a discussion of the revised covered activities, the revised desert pupfish strategy, and a review of the project status and related activities. As a result of the short review time provided, the resource agencies asked that an in-depth discussion of the desert pupfish strategy be deferred until the next meeting. We support the goal of increasing the available pupfish habitat, but the monitoring and accounting system must be of adequate detail to measure actual habitat parameters as shifts of habitat with a decline in sea level may occur. We did discuss the revised covered activities section in detail. More detail will still be needed to clarify exactly who will be covered for what activities. Because the constraints on fallowing only apply to the IID-SDCWA water transfer, IID now considers fallowing to be a viable part of the overall water conservation program. Fallowing may be used to meet the transfer of water to CVWD or MWD, or it may be required to pay back an overrun. Permanent and rotational fallowing of up to 60,000 acres may occur. The inclusion of duck club and recreational activities requires a clarification as to how this relates to water conservation. Changes in land use also needs much more specificity before the language is acceptable. Caps on the impacts associated with all activities will need to be provided in the revision of the impact analysis. We will provide information on current management for habitat areas as guidance for the development of a more specific discussion on this topic. The group acknowledged the need to lay out what will be considered a major vs. minor amendments and the process that will be required for each. This applies to many of the activities that cannot be discussed in detail at this time because of the inability to predict what new technologies may be available in the future. Experimental projects are problematic given the level of detail available at this time. We will need to evaluate what aspects can be covered by concurrence vs. those that will require an amendment to the permit. Emergency response actions also require a more detailed discussion in the document. While IID may not have a detailed response plan to form the basis of this discussion, they will provide more detailed information on the types of activities they anticipate could occur in response to the most likely emergencies (i.e., earthquakes and tropical storms and the resulting damage).

The group met again on **June 28-29, 2001.** The first item on the agenda was the revised pupfish strategy that had been carried over from the last meeting. We began with a review of photographs that had been taken of the drains that flow directly to the Salton Sea. There was

some diversity in the width and configuration of these drains that does seem to warrant including more than one approach in the avoidance and minimization procedures. It was decided that a site visit would be an appropriate forum for discussion these issues. It was also agreed that exceptions in the timing of cleaning would be limited to those required to prevent damages due to flooding. The funding provided for Pupfish Strategy 2 is being used to define a level of effort associated with this study, and we were asked to consider this a place holder at this time. A different figure may be provided in the future as we better define the exact nature of the data collection efforts. Pupfish Strategy 3 is designed to increase the available habitat for pupfish, but not to obligate the IID beyond any limits place on their activities by the Restoration Project. There is still a connectivity issue that needs to be addressed above and beyond the absolute quantity of habitat. The IID is willing to look at possible ways of connecting the individual drains separate from the Salton Sea given that salinity may at some point preclude this movement. The habitat accounting is yet to be finalized. The primary metric will be the linear distance along the drain, but factors such as flow, depth, and channel width will have to be considered in determining if all areas of these drains will be considered pupfish habitat. The ultimate measure of suitability will be the occupation by pupfish as measured in their effectiveness monitoring. There will be similar issues at the drains in the north end of the Salton Sea. IID intends to contact the Coachella Valley Water District on this issue. Water quality in these drains, particularly in regards to selenium, has yet to be resolved. We are still waiting the results of the modeling for these areas. IID decided to delete Pupfish Strategy 4, but this type of approach may need to be re-considered pending the outcome of the modeling. Should contaminant levels rise too high for pupfish reproduction, some means of excluding them from contaminated habitats may be required. There may be limitations based on the amount of canal water available in some areas. Another issue came up in this discussion, and that was the life of each strategy. Their intention is to conduct these activities for the life of the permit (not in perpetuity) given that they cannot predict whether the transfer would be renewed or cease at that point. This is very unusual, as most HCP mitigation actions are in perpetuity. Also, IID needs to consider such changed circumstances as a major cessation of farming activity in the Imperial Valley during the life of the permit. They will consider these aspects in more depth. Pupfish Strategy 5 will be modified to reflect that there will not be surveys to demonstrate absence; instead, all activities in potential habitat will include the avoidance, minimization and mitigation measures.

There were two new general commitments in the HCP introduced at this meeting. One was for a full-time HCP implementation biologist, and the other was to arrange for a technical advisory committee to be formed. Given that the membership of the committee is to include the IID, CDFG and the Service, the HCP Implementation Committee was deemed to be a better name. This leaves open the possibility that scientific experts could be brought in to provide support on specific implementation or monitoring issues.

The **Burrowing Owl and Desert Strategy revisions were not received until June 26th**. This did not provide the resource agencies with adequate time for a full review, so CH2MHill provided the group with an overview of these two revisions. The general comments that were offered by the agencies included the need for a cap on impacts to burrowing owls and identification of the

parameters that will be considered in developing burrow banks. CH2MHill will attempt to develop a set of guidelines that will be used to determine when burrows compromise the integrity of the canal linings. These strategies rely on the HCP biologist to develop a good sense for where owls can be found in the valley to appropriately coordinate the proposed activities. Site specific construction plans with avoidance and minimization measures for owls are to be incorporated into construction projects. **This discussion is being carried over to the next scheduled meeting on July 6, 2001.** The desert strategy was also reviewed with some specific comments being provided by the resource agencies. Not all items from the previous discussion have been incorporated into the revised text including a diagram of the right of way lay out along the canals, a quantification of the maximum impacts anticipated, a discussion of the types of emergency actions that may occur in this habitat, burrowing owls should be included among the species in this habitat so it should be clear that those strategies will apply when appropriate, and the coverage for the use of the old canal (once the new one is constructed) is not clear. There are species in the HCP that were not covered by the consultation process on the lining process, and we need better information on the activities and associated impacts before they can be covered. Also, no State permit was issued for the project. The timing of the monitoring could allow for impacts to occur prior to surveys being completed. Surveys will need to be phased such that no construction occurs prior to the surveys for the area and so that clear progress is being made on the surveys throughout the three year period allowed for completion. Appendix C, which provides species-specific avoidance and minimization measures, will eventually be expanded to include all of the covered species. **This discussion will be continued at the meeting scheduled for July 24, 2001.**

A lengthy discussion ensued on the legislation that is being developed to support the Salton Sea enhancements that IID has proposed to meet their mitigation obligations. The Salton Sea Authority approved supporting the legislation (in addition to ongoing restoration planning). The funding request includes $60 million for Salton Sea enhancements and nearly $60 million for reservoir projects associated with the All American Canal lining. The draft HCP would be part of the legislation package, and it would be deemed to comprise full compliance with the Endangered Species Act. The implications for our planning process are not yet clear. The driving concern to this legislation are the benchmarks required by the Interim Surplus Criteria. Any funding received for the Salton Sea will be rolled into the restoration if that project moves forward within 5 years. Otherwise, the funding would be used for the enhancements proposed in the HCP to meet all obligations associated with water conservation driven changes in the Salton Sea. IID would like to continue to work with the resource agencies on these proposals. If these are not acceptable, work on this aspect of the HCP will not continue. They will forward a copy of the legislation as soon as it is introduced and available.

The group met again on **July 6, 2001**, to complete our discussion on burrowing owls and to begin a discussion on monitoring under the HCP. We began with burrowing owls. The focus of the HCP strategy for burrowing owls is on activities that could collapse or close off the burrows. The strategies in the HCP are designed to avoid and minimize the occurrence of burrow collapse and closure. Acknowledging that there would still be losses, the HCP need to promote recruitment

such that reproduction can balance losses. The greatest difficulty in this revolves around IID's limited ability to address factors other than burrow number. IID is willing to implement actions on their land, but this was offered as part of an adaptive management approach rather than as a proactive means to promote owls. Subsidies to farmers to grow crops that are beneficial to burrowing owls was another means recommended to address this limitation. Changes in crops over time may impact burrowing owls, and this should be considered under changed circumstances. Drain cleaning was clearly addressed by the strategy, but aspects of canal cleaning may also have impacts and should be addressed. The strategies do call for much greater interaction between the crews in the field and the biologist. IID did commit to having an interim worker education program developed in 6 months. The resource agencies are still looking for some kind of cap on the impacts (e.g., number of burrows and miles of canals and drains affected in a year). Some creation of burrows is being offered up front, but it was not clear what categories of activities were to be covered. Clarification will be provided. Given the cap on spending once permitted, it is important that the number of burrows provided meets all of the needs intended. Several issues were raised in regards to monitoring. The monitoring needs to be able to detect change such that actions can be taken in a timely manner. The monitoring approach needs to be defined. Are we measuring numbers, reproductive rate, both, or something else? The overall goal is to sustain the population. The first objective is to maintain the existing distribution and abundance of burrows in the area. There is a gap in our understanding of the habitat parameters required by owls. If this could be resolved, we can use the monitoring to identify adaptive management that needs to be implemented. This adaptive management would include the second objective which is to maintain other biological factors required by burrowing owls to the extent possible given IID's land and other resources.

In our discussion of monitoring, the main focus was the need to develop the right questions to be asked. Given the time frame we are dealing with, the frame work for monitoring needs to be developed quickly. Several meeting dates were scheduled. Not only do we need to develop the appropriate questions, but we need to develop the parameters to be measured and the techniques to be used as much as possible in order to support the development of an adequate monitoring budget. A combination of species specific and habitat monitoring will be used. We also need to make sure we are all using the same definitions for some frequently used terms such as habitat use and habitat quality. The species/groups are: burrowing owls, desert pupfish, bats, drain/marsh species, desert species, tamarisk scrub species, agriculture species, and Salton Sea species. We discussed deferring bats given our current lack of knowledge. IID prefers to defer the Salton Sea species to the last given their lack of flexibility in measures for those species.

The Service, CDFG, IID, and CH2MHill met to discuss burrowing owl monitoring on **July 11-12, 2001**. The goal for burrowing owls was identified as the maintenance of a self-sustaining population of burrowing owls over the current range of the owl encompassed by the HCP area. The primary objective that supports that goal is to maintain adequate burrow availability and community parameters (e.g., burrowing mammals, foraging habitat), to the extent that IID can influence these parameters, at levels to support the initial distribution and relative abundance of owls on lands covered by the HCP and affected by the covered activities. The monitoring

program will include a compliance component in that the biologist will conduct spot checks to assure the avoidance measures (provided in the worker education program) are being implemented. The effectiveness monitoring includes 2 components:

1) a relative abundance and distribution survey (RAD) to be conducted annually in April, with 20% coverage each year in a rotating panel scheme if feasible (default is by major "drainsheds"); and

2) an intensive demographic study in 2 or 3 sub-populations that will measure productivity and recruitment over a 12-15 year time period (the number of nests to be determined statistically).

IID expressed concern that the level of monitoring was not commensurate with their likely impacts to the owls, but this was deemed necessary to establish the baseline condition of the population. Adaptive management actions will be taken on the basis of the population status as defined by the demographic study or based on a drastic change identified in the RAD. If the cause is determined to be covered activities, the Implementation Team (IT) will work with IID to enhance their avoidance and minimization measures and/or consider constructing artificial burrows in appropriate areas. IID's farmer education program will be of assistance in minimizing impacts from farming activities. IID also raised the concern that they may be held responsible for birds moving away from canals or drains to other lands in the Imperial Valley. Burrowing owls are site tenacious, and the burrows present along canals and drains are likely to be more stable than those in farmed areas. The contingency fund developed as part of the HCP will be available to support adaptive management, and it will include funds to support up to 4 additional years of demography studies. The RAD will be conducted once throughout the entire valley to identify the appropriate areas for demographic studies to be conducted. The Service will provide an example data form. The results will be reported to the Service and CDFG annually, with a final report to follow the demography study and baseline RAD (3 complete surveys).

We continued the discussion by reviewing some of the proposed strategies. It was decided that the burrow bank would not be included as an action, but that it could be implemented as a response to a change in population status. We discussed the education programs. The worker education program will be a structured program, whereas the farmer and public education components would be more focused on providing information. The farmer education materials would focus on farming impacts to owls including pesticide use. The public outreach would be more general and could include periodic mailings of leaflets to all of IID's customers.

Nancy Gilbert and Carol Roberts traveled to Sacramento for a meeting on **July 17, 2001**, of the water agencies with the Director of the CDFG. High level managers and legal representation were present from IID, SDCWA, CVWD, and MWD. The primary topic was the possibility of completing the permitting process for the water transfer, including the Salton Sea, through the CDFG in time to meet the Interim Surplus Criteria and Quantification Settlement Agreement time lines. The water agencies gave some introductory remarks, and identified the delays in the Salton Sea restoration and Lower Colorado River Multi-Species Conservation Plan as major stumbling blocks in the permitting process for the transfer. They were relying on those processes to address the major impacts associated with changes in flows associated with transferring water from

agriculture to urban use, particularly in regards to the Salton Sea. In the absence of the restoration being permitted, they are looking for ways to achieve permit issuance criteria for the transfer relative to the Salton Sea. The water agencies believe that they should not bear the restoration costs as this would not be proportional to the magnitude of the impacts that the transfer will likely cause. They are looking for federal assistance in the form of funding for enhancements for the Salton Sea as well as a truncated permitting process for the Endangered Species Act requirements. The CDFG expressed a strong preference to continue working through the process rather than having the agencies pursue parallel state legislation. The CDFG was also concerned that the funding figure proposed in the legislation would not be enough to offset the impacts of the transfer. The group discussed the possibility of tying the permit into the restoration process in some way, but the water agencies were greatly concerned about the timing given there isn't overwhelming support for the alternative that is likely to be chosen. We discussed the possibility of streamlining the process by reducing the covered species list, but that approach was not acceptable to IID. The water agencies felt comfortable with the progress that had been made on other issues, but they were concerned that the Salton Sea could not be addressed without legislative action. The resource agencies did identify some other issues that are still waiting for resolution. The Service acknowledged that it will be difficult for us to deviate from the 5 Point Policy that requires 90 public review, and the water agencies inquired as to whether the Service could provide guidance on how that might be reduced. The California Resources Agency representative recommended against public outreach prior to resolution of the major issues. The issue of fully covered species under California law was set aside pending state legislative changes that may be forthcoming on that issue.

The Service, CDFG, IID and CH2MHill next met on **July 18, 2001.** This meeting was devoted to focusing the remaining tasks on the high priority species, and then prioritizing those tasks given that the intent is to circulate the Draft EIS/EIR and the proposed HCP on **December 1, 2001.** We prioritized these tasks as provided below:

Priority #1: Salton Sea Habitat Conservation Strategy
Priority Species - Brown pelicans, white pelicans, black skimmers, gull-billed terns, double-crested cormorants

Priority #2: Desert Pupfish Habitat Conservation Strategy

Priority #3: Drain Habitat Conservation Strategy
Priority Species - Yuma clapper rails, California black rails, Least bittern

Priority #4: Agricultural Habitat Conservation Strategy
Priority Species - Mountain plovers, white-tailed kites, white-faced ibis, black terns, long-billed curlews
Second Priority Species – Hispid cotton rats

Priority #5: Tamarisk Scrub Habitat Conservation Strategy
Priority Species - Large-billed savannah sparrows, white-tailed kites, yellow-breasted chats, willow flycatchers, yellow-billed cuckoos

Priority #6: Desert Habitat Conservation Strategy
Priority Species - Desert tortoise, flat-tailed horned lizard, Pierson's milk vetch, LeConte's thrasher

Priority #7: Bat Habitat Conservation Strategy
Priority #8: Razorback Suckers
Priority #9: Colorado River Toad Habitat Conservation Strategy
Burrowing Owl Conservation Strategy - **Done**

We scheduled additional meetings in order to address all of these priorities in time **to wrap up input on the HCP by the end of September 2001.** We discussed briefly concerns over the proposed enhancements for the Salton Sea and the limitations of the funding level in the proposed legislation. In particular, the suite of enhancements do not specifically address our high priority Salton Sea species with on-site enhancements. IID informed us that the amount was deemed appropriate by the bill's sponsors and would not be changed. The bill's language has been modified to allow for increased flexibility as to how the funds are spent. In addition, the bill does not preclude future funding requests for expanded or additional enhancements. CDFG raised the possibility of considering a fish hatchery as part of the project to extend the availability of fish for fish-eating birds and recreational fishing. IID was open to the concept pending an analysis of the term of the benefit in the absence of a full restoration.

On **July 19, 2001,** the group re-convened (CDFG by phone) to discuss drain monitoring. The key to the approach here is to maintain similar life history functions of the target species in the created habitat that currently occur in the drains. The drain vegetation survey will not be completed prior to completion of the HCP. The previous Hurlbert figures will be used as estimates with the final totals to be determined based on the surveys once completed. The Service was concerned that there needed to be a stated minimum acreage to be provided in the HCP with increases as determined by the surveys to be accommodated in addition. IID stated that they want to be able to adjust the acreage up or down as indicated by the surveys. The Service is reviewing this issue. The approach to monitoring would include point counts for birds, call counts for rails and frogs, and small mammal trapping. The surveys would be conducted seasonally, and breeding use would be assumed if the species was present during their breeding season. Three years of baseline surveys are to be conducted in the drains as the basis for future comparisons.

The wetland creation is scheduled to occur within 5 years of permit issuance. CH2MHill has recommended phasing that so we can evaluate each phase prior to construction of the next and make modifications as necessary. This would require 15 years for construction of the complete wetland habitat package. Following the creation of habitat, surveys will be conducted for 5 consecutive years. Surveys would then be scheduled for every 5th year following this initial period. The group discussed the need for continuing the drain surveys once the created habitat was replaced. Although there are advantages and disadvantages to both approaches, we determined that they would only be continued if the IT felt it necessary to interpret the effectiveness monitoring. Because active management will be required for these habitats, it was decided that a management fund is appropriate here rather than the contingency fund approach taken with the burrowing owl. IID is looking for input from the resource agency land managers as to how best to design and manage habitat for Yuma clapper rails. It was decided that although surveys would be conducted for other species, our management would focus on clapper rails

given we have more information and experience in managing for this species that we do for our other priority species. We will accommodate the other species needs to the extent those needs can be identified and they are not incompatible with managing for Yuma clapper rails. The group was also seeking ways to focus monitoring on habitat elements given use cannot be guaranteed. The group agreed that the appropriate approach was for IID to commit to managing the habitat in the same fashion as the Service and CDFG manage their lands for Yuma clapper rails, and that surveys for this species would be conducted on the same schedule. Should the resource agencies cease surveys, the survey frequency would revert to the schedule of every 5th year following the initial 5 year survey period following creation. IID also agreed to work cooperatively with the Service and CDFG in efforts to optimize management including gathering data on some habitat parameters as part of the survey efforts. Point counts for other species would be conducted on the original schedule (every year for 5 years, then every 5th year).

The group discussed amphibian surveys and determined an approach for lowland leopard frogs. The baseline surveys will be conducted in the drains. If no lowland leopard frogs are found, the surveys will not continue. If frogs are identified in the drain surveys, the created habitat would be surveyed per the schedule. Small mammal trapping for cotton rats will also be conducted along the drains. Herbaceous cover will not be mitigated in the created habitats, but avoidance and minimization measures will be developed if use by these species is found along the drains.

The group met at the Carlsbad Fish and Wildlife Office on **July 24, 2001**. The topic of discussion was the drain strategy. After some consideration of the proposal, the Service raised concerns about how reviewers of the strategy would view its adequacy. The mitigation would replace 20% of the drain habitat and would take a minimum of 5 years to be implemented in which time 100% of the drain habitat would have been cleared on a rotating basis. In addition, this process would be repeated an average of 15 times across the life of the permit. We recommended that IID consider a 1:1 replacement ratio for all suitable habitat in the drains, and we suggested that it would be appropriate to identify a minimum commitment that would be adjusted up if necessary based on the vegetation surveys that are to be conducted in the first year following permit issuance. IID was open to this approach, but they required a cap on the amount of habitat creation they would be responsible for as part of the HCP. Given that the Hurlbert report is the best information currently available, we used the estimate of vegetated acreage derived from that study as our maximum (652 acres). Because of the difficulty in demonstrating absence, the concept of occupied habitat was replaced with what is deemed suitable for the covered species. The Service has in house expertise that could be called upon to assist us in determining which vegetation types of those identified in the surveys are suitable for the covered species. The question was raised as to whether drain species surveys would be required. We determined that it may not be necessary if we are mitigating 1:1, but it would be desirable to have some site specific information on the species habitat use to confirm our determinations of suitable habitat. We will need to agree on what experts would be involved in this determination and identify a process for resolving any disputes on technical issues. The habitat creation could be phased to accommodate any new information developed based on the results of the baseline vegetation and species

surveys. The proposal was to create 1/3 of the habitat at 5 year intervals so habitat construction would be complete within 15 years. This is currently being considered.

The next issue was related to whether this acreage would cover only the drain cleaning activities or all activities in the drains. Given that there is a 100% replacement, IID felt construction impacts should be included in that. The Service concurred with that approach, but it is important that the relative magnitude of permanent (construction) versus rotational (drain cleaning activities) impacts be specified in the document. The basis of our concurrence was the fact that permanent impacts are currently anticipated to be relatively minor. IID agreed with the caveat that any quantification is their best estimate, not a cap. The cap on habitat creation will still apply if they exceed that value. The last issue to be addressed related to the acreage is water quality impacts. The Service will confer internally on whether a 1:1 replacement is adequate to address both types of habitat creation implemented in association with contaminant impacts. The first part of the Service's approach is to provide alternative habitat to attract nesting species away from the contaminated habitat. The second part of the approach is to provide additional breeding habitat to supplement reproduction in the population in an effort to offset reproductive losses among those individuals that forage in the contaminated habitat. We will provide a response as soon as we have had the opportunity to confer with our in-house expert.

The next issue raised was the current ceiling on the selenium concentration in the water of 5 µg/L or the concentration in the source water. This is an issue for two reasons. We have determined that this concentration was a jeopardy for listed species in our evaluation of EPA's California Toxics Rule. Also, impacts have been found in sensitive species due to biomagnification of selenium at this water concentration. If habitat is to be created to offset impacts, including those associated with degraded water quality, it should not then be subject to those same kinds of impacts. IID was not open to the possibility of having to treat water prior to discharging it into the mitigation habitat. Additional discussion will be required on this issue.

Chapter 3 in the document will be re-structured to address these changes. CH2MHill will develop a preliminary determination of vegetation types used by covered species for review to supplement the discussion in the document. IID is working on some text to describe how burning is used in drain maintenance to be incorporated into the text as well. The 84 acres of "adjacent" wetlands will still be addressed separately either through supplementation of the water supply to these areas or creation of replacement habitat. The resource agencies concurred with the vegetation survey approach developed previously. Issues for our next meeting include the need for supplemental mitigation for water quality and more specifics on monitoring and management. IID stated that they would provide a copy of the drain model results to the Service at that meeting.

The group met on **July 27, 2001**, to continue the discussion of the drain strategy. The first topic of discussion was the need for additional acreage to mitigate the impacts of drain selenium contamination. After conferring internally, it is the Service's determination that additional habitat would be appropriate to offset the impacts of the selenium contamination in the drains. The Service has addressed selenium contamination in other systems using a two-prong approach that

includes alternative habitat (the 1:1 drain mitigation would fulfill this need) to attract species away from the contaminated habitat and compensation habitat that provides for an additional increment of reproduction to offset any reproductive losses associated with birds that may still use the drains. The Service supported the approach taken by CH2MHill in their initial development of this acreage. CH2MHill was of the opinion that this was mitigating twice and was unnecessary given that replacement habitat would be for 100% of the suitable habitat (complete take permitted). IID was open to the concept, but they wanted to be assured that this extra mitigation would allow them added flexibility in managing the drains. After a lengthy discussion it was decided that (pending IID Board approval) habitat would be mitigated based on a vegetation survey replacing 100% of the suitable habitat with additional acreage added for selenium impacts associated with on-farm and system conservation. The parties agreed to use 190 acres as a minimum commitment to mitigate for maintenance, construction and selenium impacts. Following the vegetation surveys, this number will be recalculated based on the survey results and the selenium formula developed by CH2MHill. **If this total is less than or equal to 190 acres, 190 acres of mitigation habitat will be created. If this number is greater than 190 acres, additional acreage will be created up to 652 acres (the agreed upon cap).** Measures 1, 2, 4, 5, and 8 will thus be collapsed into a single measure. The text discussion of the methodology will be maintained. IID then suggested that the measure that provided for surveys for construction projects during the breeding season (Measure 6) should not be required as no surveys are required for maintenance activities. Additional discussion occurred whereby the group concluded that it would be appropriate to maintain this measure for projects that resulted in permanent losses of habitat. As these projects are generally scheduled, it should be feasible to schedule them outside the breeding season. IID and CH2MHill will develop language that specifies what projects fall into this category and what construction is considered routine maintenance. The Service requested that this include a quantification of these projects in addition to the definition. CH2MHill requested guidance on how the effects analysis should be presented. The Service suggested that they more completely delineate the effects then follow with an explanation how the measures offset those effects. The current discussion in the document does not adequately address the effects, particularly for our focus species.

We briefly discussed the monitoring approach we had discussed previously. It was agreed that long term surveys would not be needed in the drains. Baseline surveys, for vegetation and covered species, would be conducted in the drains. The created habitat would be surveyed for Yuma clapper rails on the schedule used by the resource agencies (currently annual) but no less than once every 5 years (should the agencies cease to do them more frequently). Management would also be in line with what the resource agencies were doing. CH2MHill requested a copy (second request) of the National Wildlife Refuge's management plan. The Service agreed to contact the Refuge with their request. One management issue that was in conflict with the HCP proposal was the concentration of selenium that would be permitted in the water used to support the habitat. The Service is on record through the California Toxics Rule biological opinion that 5 µg/L selenium is not adequately protective of wildlife. We have recommended that 2 µg/L be used as a maximum in water for wildlife habitat. Given that the Colorado River is the best quality water available in the Imperial Valley, the Service requested that IID commit to using this water

for their created habitat. IID responded that this raises a water rights issue, and they may not be able to comply. CH2MHill recommended that we keep the current standard, but this would be inconsistent with the Service's previous determination. After lengthy discussion, we concluded that it would be acceptable for the restriction to be that: **IID will use Colorado River water, water of equivalent quality to Colorado River water (in terms of selenium concentration), or water with a selenium concentration at or below a selenium criterion promulgated by EPA with a no-jeopardy biological opinion from the Service.** IID will take this to their Board for approval. Several other issues were deferred to the future to be determined by the HCP IT including siting of these habitats. CH2MHill agreed to develop some general siting criteria.

The last issue discussed was the fact that IID had found errors in their drain model report and would not be able to provide it to the Service at today's meeting. They were hopeful that it would be available sometime the following week.

The group re-convene in Sacramento on **July 31, 2001. The topic of this meeting was the Bureau of Reclamation's Salton Sea model.** Paul Weghorst from the Bureau's Denver Office gave a presentation on the model including the assumptions that went into developing the model, calibration and verification of the model using historical data, and the predictions made by the model based on four scenarios (including a baseline condition). The baseline incorporates the previous water transfer that was recently completed, a higher salinity level for the Colorado River, reduced surplus flows, and reduced flows from the Coachella aquifer resulting from overdrafts. Salt precipitation in the Salton Sea was included, but the value used for each run was sampled randomly from the entire range of precipitation rates identified by salinity experts. Baseline runs indicate that the elevation and area of the Sea will continue to go down, and the salinity will continue to rise. The two tailwater recovery scenarios evaluated indicate that the rates of change will increase for all three parameters, although the absolute change will not be large in the short term. Conservation by fallowing gave results that were intermediate but somewhat closer to the baseline condition. Mitigation fallowing could be added to this final scenario to allow for increased flows to the Sea that would result in no net increase in the rates of change of salinity, elevation and area over the baseline condition. IID raised concerns over mitigation fallowing in regards to water rights and accepted beneficial uses. IID also expressed concerns with the solar pond alternative for restoration in regards to the location being in conflict with possible mitigation habitat locations. The Service raised concerns over the assumption that 100,000 acre feet of water per year would go to CVWD rather than MWD. If this were not correct, the model might underestimate the magnitude of the changes. The representative from CVWD said that they would be seeking out that volume of water from some other source if not from IID, so the volume assumed to flow to the Sea should be correct. The Service will require some substantiation of that assumption.

The results of the Imperial Valley hydrological model were not yet available to the Service.

Following the HCP meeting, **a second meeting was held between the water agencies and the Directorate of the CDFG.** The California Resources Agency was represented by Mike Spear.

The group provided copies of the priorities and the schedule we had developed to complete work on the HCP development by the end of September as the water agencies had requested. There are many issues yet to be addressed, and monitoring and adaptive management have to be included. The water agencies re-iterated that **this date was based on a completion date for all QSA requirements of December 31, 2002.** CDFG recommended that work begin immediately on the Implementing Agreement (IA) framework with details to be added later. **The Service identified the need to have access to the draft EIS/EIR sooner rather than later if we are to complete this process in their time frame. IID stated that this should be available soon.** When asked how the Salton Sea will be addressed, IID responded that the approach is based on the approval of Federal legislation. The State did not appear to be interested in working on the HCP in this case given the negotiating disadvantage to them associated with such legislation. The water agencies were still interested in pursuing an administrative solution with the State, but they were not willing to cease their efforts on the Federal legislation given that failure to meet the deadline is not an option for California. Mike Spear suggested that a planned release of the HCP and Draft EIS/EIR on December 3, 2001 does not require Federal legislation. Instead, he recommended that there should be a way for the transfer to be linked to restoration without excessive burden on the water agencies such that a permit can be issued within their time frame. Funding for the enhancements could still be pursued without the override of the Federal Endangered Species Act. CVWD raised concerns over tying the two together given that restoration will likely take some time to be approved by Congress. Mike Spear responded that they cannot be untied biologically. IID wants assurances that the agencies would not come back for additional mitigation in the future.

The Service continues to support going through the normal permit process as appropriate to our fulfilling our mission. Funding may be appropriate to address the water transfer's contribution to the degradation of the Sea. The State would like to see a commitment to restoration of the Salton Sea from all of the water agencies, including the possibility of fallowing for conservation. This approach apparently has very little support in the Imperial Valley, and it will take time to get local support for this as part of the solution. The water agencies stated support for the restoration, but not at the expense of the southern California economy. The transfer must be allowed to go forward. The water agencies were not willing to defer the legislation until the next Congressional session stating that there would not be adequate time to complete all of the necessary steps. Also, they need to limit the time frame for legal challenge given the Interim Surplus Criteria (ISC) benchmarks so that aspect will also have to remain.

When asked, IID stated a willingness to consider mitigating for the transfer's incremental effects on the Sea. However, it depends on the specific benchmarks that are used. If a salinity of 50 parts per thousand is considered to be a limit for fish, then the transfer does not significantly change when that will be reached as compared to baseline. We haven't yet resolved what benchmarks will be used. The Service pointed out that there have been previous reductions in the inflows to the Sea that were identified as not being significant and so were not addressed. This is contributing to the current condition of the Sea. CDFG recommended that we focus on restoring the Sea not just dealing with increments because "the Sea is going to die anyway". IID responded

that they will only deal with the effects of the transfer. The State suggested that all need to take some responsibility for the assuring the restoration of the Salton Sea. The water agencies agreed to work with the State on developing language that would link restoration to the transfer HCP to satisfy permitting requirements but be acceptable to the water agencies. The water agencies were essentially offering to commit to promoting restoration. IID is seeking assurances, but only the Service pointed out that only changes beyond those predicted by the model could be considered unforeseen. Changed circumstances like those identified by the model need to be addressed. When the discussion returned to the current schedule, the Service recommended that the process could be facilitated by giving IID staff more authority in the decision-making process and by reconsidering some of the species on the current list. IID did not feel that the current funding cap would provide for all of the biological needs of the HCP. A follow up meeting on the "linkage language" was scheduled, and the meeting was adjourned.

The next meeting was held in the Imperial Valley on **August 8, 2001**. This was the group's first opportunity to begin the discussion on the Salton Sea strategy. IID requested that we all keep in mind that this program will only mitigate its impacts. IID will not be taking on responsibility for restoration of the Salton Sea. They will only take responsibility for the difference between what will occur with the project versus what would occur in baseline conditions. In the case of fish-eating birds, this is the amount of time the Sea will not be available for foraging to these species as compared to baseline. For discussion we used a benchmark salinity of 60 parts per thousand. Based on the Bureau of Reclamation's Salton Sea model, the Salton Sea would reach that benchmark 9 years sooner with the conservation and transfer program. However, providing for the needs of the numbers of fish-eating birds that use the Salton Sea even for this amount of time is beyond the means of IID. Either we would need to restore the Sea, or we would need to create something nearly as large. There are smaller scale actions that can be implemented, but we need to determine what these should be. CDFG would like to see a hatchery included as part of the enhancement package. They are looking at sport fish and tilapia (which is a species that is easy to raise in ponds) to address the recreational impacts as well as impacts to fish-eating birds.

There are impacts resulting from elevation changes such as loss of nesting and foraging areas. IID felt comfortable with the fact that these are largely engineering issues that could be addressed. They suggested the possibility that shallow shorebirds foraging areas could be bermed and maintained in a flooded condition. They were not as interested in island creation in the Sea given that the elevation may continue to change for some time. Nesting habitat can be provided in a variety of situations including on smaller scales. Small islands could be placed in the mouths of drains and/or in the created wetland habitat to address species such as the gull-billed tern and black skimmer. Shoreline pools should also be considered for desert pupfish. If such pools are not created naturally by wave actions as the Sea recedes, it will be necessary to evaluate the need to artificially create such habitat. Part of this process may be a study of how pupfish use shoreline pools in the Salton Sea system.

There will be impacts to fish-eating species and desert pupfish from changes in salinity. A hatchery may provide for the extension of fish presence in the Salton Sea, but would only provide

a short term remedy. Although fish ponds could be created for fish-eating birds, IID did not like this option given the short term nature of their requirement to supplement fish. They were more interested in off-site projects that could provide more extended benefits to covered species. One of the questions that came out of the discussion was in regards to whether the Salton Sea provides key habitat for any individual species. The white pelican figured prominently in this discussion. We do not have information at this time that would confirm or refute the importance of the Salton Sea as key wintering/migratory habitat for the white pelican. The general approach that is being considered is to: do studies to evaluate the importance of the Salton Sea to fish-eating species, see if restoration is on track to move forward, and choose the enhancements that make the most sense given that there either will or will not be a restoration project. A hatchery would make sense as a temporary bridge to a restored Sea, but it may not be a viable choice if restoration is not expected to move forward. In the absence of restoration, we may be forced to consider off-site mitigation for some species. The Service and CDFG were asked to provide input as to whether the agencies would consider off-site mitigation and for which species. CH2MHill is also looking for input on what specific studies will be needed. The HCP IT would be responsible for determining what response actions are most appropriate given the outcome of any studies and the fate of the restoration program.

The group met again on **August 9 and 10, 2001**, to tour the pupfish drains in the Imperial Valley. In the afternoon on August 9 the group met to discuss if the strategies as currently laid out made sense. Touring several of these drains provided much material for discussion in the afternoon. It was clear from the tour that there are drains, particularly on the southeast side of the Sea, that are not wide enough to clean and still leave vegetation behind. There were also examples of drains that are left unmaintained because they have adequate slopes to achieve the needed drainage (e.g., Trifolium 19 and Trifolium 1). Several of the measures originally proposed came into question, however. Given the fact that adult tilapia were seen gathered at the mouth of one of the drains, we questioned the appropriateness of cleaning in a downstream direction. Timing restrictions were questioned given that pupfish may bury themselves in the mud during the winter months and thus would not be able to avoid the cleaning equipment. Another concern that was raised was the possibility that dredging only part of the drain would leave the vegetation above the new flow level and would then not provide any habitat for pupfish. The key to determining what is more appropriate in this regard is knowing what the flows will be following cleaning operations. It was undesirable to have these measures result in the need for more frequent cleaning as well. Connectivity and water quality were identified as issues that would need to be addressed. **The model results were not yet available.** We re-aligned the strategies to reflect the discussion. The strategies that remain are as follows:

Strategy 1 - IID will maintain the existing habitat and increase the habitat as changes in elevation allow;

Strategy 2 - IID will provide for some connectivity between drains to allow for pupfish movement;

Strategy 3 - A study will be conducted to determine if pupfish do bury themselves during winter months requiring avoidance of those months of the year for cleaning;

Strategy 4 - Activities that require dewatering will include salvage and relocation of pupfish;
Strategy 5 - Water quality impacts (i.e., selenium) will be examined by the planned Service study and appropriate actions will be implemented such as making highly contaminated drains inaccessible, enhancing those areas with less contamination, and incorporating simple biological treatment systems into the drains.

These strategies will be reviewed at an upcoming meeting and finalized. In addition, we hope to develop a more specific monitoring and adaptive management program at that time.

The group met again on **August 14, 2001**, to discuss the desert strategies. IID felt that they could provide an estimate of the acreage of the rights-of-way in the desert areas and the disturbed areas within those rights-of-way from their documentation and aerial photographs. **This was requested with our initial review and re-iterated when comments were submitted to the consultant on July 19, 2001.** The objective is to provide some sense of scale in the document for the areas that are routinely used in the course of the covered activities. We reviewed the covered activities that were considered to have no effect on covered species and found that there were drains associated with seepage collection that do require maintenance. This topic will be removed from the table and discussed. Additional information will be provided in the discussion of the effects of covered activities to specify the frequency of these activities. The text of this section will also be re-worded to clarify what is meant by each of the covered activities. The discussion will consider the fact that all structures are likely to require replacement during the life of the permit. All activities will be limited to the currently disturbed areas to the extent practicable, and all impacts to desert habitat will be mitigated at a 1:1 ratio. IID felt confident that such impacts could be limited to 5 acres or less. IID will provide a list of the types of structures that are included in construction activities. The lining of the All American canal will not be covered, but maintenance of the existing canal will be included. For the purposes of discussion, the HCP will assume it will be maintained as an emergency conveyance. If IID determines that this is no longer desirable, changes to the use/maintenance of the old canal can be addressed by amendment. It is anticipated that any changes would result in fewer impacts. Management will be in accordance with the Service's biological opinion for the project. Operation and maintenance of the new canal segment will be covered as for the existing operating portions of the canal. Minor changes were incorporated into the strategies and Appendix C to better address specific species needs. Monitoring is planned that will include baseline surveys and presence/absence surveys every 5 years to update the worker education program. Because the program is focused on avoidance, specific effectiveness monitoring has not been identified. Compliance monitoring will be included, however. IID will encourage their employees to report all sightings, injuries and mortalities as part of the reporting process.

The results of the hydrological model were not made available to the resource agencies at this meeting.

The group met on **August 15, 2001**, to complete the discussion of the desert pupfish strategies. A new list of pupfish strategies was provided, but this was lacking any supporting text. It was

decided that the most practical measure of drain habitat for desert pupfish was by the linear distance between the final control structure on the drain and the Salton Sea. As the Sea recedes, there will be opportunities to add other habitat features that could benefit pupfish when these drains are extended. IID committed to maintaining up to twice the current amount of potential habitat based on linear distance. Beyond this amount, no specific maintenance will be provided. However, drain water is expected to continue to flow to the Salton Sea even without specific maintenance (as was seem with some of the existing drain examples visited in the field). Connectivity among the south end drains will be provided for in three subsections: northeast of the Alamo River, between the Alamo and New Rivers, and northwest of the New River. The specific method of connection will be that which is most cost effective given the topography and the drain configuration.

The strategies were re-organized to better reflect the priorities of the program:

Strategy 1 - no net loss of potential pupfish habitat in the drains as measured based on linear distance in the drains;

Strategy 2 - The HCP IT will develop design features for incorporation into the drains that address water quality concerns;

Strategy 3 - IID will take advantage of the receding Sea to increase the potential habitat for desert pupfish by extending the drains and providing for connectivity between them;

Strategy 4 - targeted studies will be conducted to evaluate specifics of the maintenance procedures and identify the appropriate timing direction and extent of maintenance on an annual basis; and

Strategy 5 - Activities requiring dewatering for construction in drains will include salvage of desert pupfish by qualified personnel.

Monitoring of water quality constituents was also discussed. In regards to selenium, collection and analysis of invertebrate prey items offers the most efficient means of tracking exposure in the drains. Turbidity should also be monitored and controlled to the extent feasible. Population surveys will be conducted to demonstrate use of drain extensions and connections. If more effective survey techniques are developed in the future, they will be incorporated into the monitoring program.

The Salton Sea was the topic of the meeting on **August 21, 2001**. A brief synopsis of the proposed state legislation was provided. The proposed covered species of greatest concern in this discussion were the brown pelican, the American white pelican, the black skimmer, and the double-crested cormorant. CH2MHill provided a review of the approaches that they had considered to mitigate impacts to these species. All options were dropped from consideration because of their costs. Based on the Bureau of Reclamation's Salton Sea model, 60 parts per thousand salinity will be reached 9 years sooner with the project as compared to the baseline condition. This threshold is an estimate of the salinity threshold for tilapia reproduction and was greed to by the group. Some of the assumptions provided in the options discussed were not considered appropriate and should be reconsidered in the analysis. IID requested ideas for alternatives given that none of the options they had explored appeared to be feasible. They would

prefer to identify smaller scale projects that can be permanent (including off-site) that could benefit these species rather than addressing the full number of impacted birds over just the course of the 9 year time differential. They are not considering projects that would address the full number of birds over the life of the permit. The other option discussed was to provide some funding to study these species, better identify the needs that have to be met to mitigate the impacts, and design mitigation actions accordingly in the future. The Service was concerned that this approach was too general to meet the permit issuance criteria. We will need to be able to demonstrate that the benefits offset the impacts, and that cannot be done without at least having some criteria that the future projects will have to meet.

The Service raised the issue of how the transfer might affect the ability to implement a successful restoration project. IID responded that their concern was to mitigate the impacts of the transfer; the responsibility to restore the Sea was with the lead agencies on the restoration project. However, given that on-site, in-kind mitigation is the most appropriate, we need to know what the possibilities are within the Salton Sea area and whether those possibilities need to be independent of a restoration project. IID is currently looking at providing funds towards the restoration or conducting enhancements that mitigate the impacts independent of a restoration project. The legislation is the preferred vehicle for obtaining the needed funding regardless of the option chosen.

To move forward with the discussion, the group agreed to discuss options that could be considered in the absence of restoration, focusing on the 9 year time differential predicted by the model. CH2MHill will look at ways to quantify the impacts. Funding requirements to offset those impacts would then be developed. The current suite of off-site projects provided in the HCP does not specifically address the species most affected by the changes at the Salton Sea. Some alternatives for consideration were provided. We began the development of a list of criteria that could be specified in the HCP for developing projects. Thus far this includes: the location should be in the Pacific flyway, they should offset the impacts of the water transfer in terms of magnitude, and they should provide for the functions and values required by the species impacted at the Salton Sea. The concern with incorporating off-site projects into this effort is that they may be too remote from the location of the impacts to truly offset them. This issue still needs to be resolved.

Issues yet to be resolved as of this meeting include: addressing the habitat and connectivity needs of desert pupfish at the north end of the Sea, drain water quality results (they are due to the office shortly), and a re-write of the pupfish strategy text.

The **Service met with management staff from the CDFG** in Sacramento on **August 22, 2001.** The discussion focused on the Salton Sea. The major problem with the approach proposed in the draft state legislation is that permitting is based on the completion of a report that is non-binding in regards to actions taken to restore the Salton Sea. The Resources Agency was concerned that piecemeal approaches would also be unacceptable in terms of fully mitigating the impacts of the water transfer. Under the Endangered Species Act, a report to Congress is not likely to meet the

permit issuance criteria. Taking advantage of the opportunity to encourage a more rapid completion of the Feasibility study is reasonable, but there have to be additional actions to result in meeting the criteria. All agreed that the water agencies should support restoration publically to help increase its chances of success. Concerns were raised by both agencies regarding the 9 years of mitigation being provided for a permit with a life of 75 years. This 9 years may mean the difference between success and failure of the restoration.

The Service was invited to participate in the third meeting between CDFG and the water agencies held on August 22, 2001. CDFG wanted to revisit the species list and determine if there was willingness among the water agencies to drop species from the list. Some species can be addressed by the habitat approach to mitigation, but others are lacking needed information and should be reconsidered. The water agencies asked the resource agencies to provide a list of those species the resource agencies would like to have reconsidered and why. The group discussed what actions were driving the schedule. Although the State Water Resources Control Board action is key, it was not the only factor in the need for completing the HCP by the end of September 2001. The water agencies will provide a clarified schedule that highlights the critical paths. The Service reminded the group that our 5 Point Policy requires a 90 day public review of the Draft HCP and EIS package.

In regards to the Salton Sea and state legislation, the Resources Agency was emphatic that the language be clear that the compliance provided is only for Salton Sea species. The "in-valley" species will go through the normal compliance process as part of the HCP. In the absence of a legislative solution, the water agencies expressed their intention to pursue a determination that impacts to Salton Sea species are not significant due to their temporal nature and do not require mitigation. Both the Service and the CDFG responded that whether temporal or not, the impacts constitute take that must be permitted and so must be mitigated. The water agencies hope to see action on the Federal legislation in September 2001.

A brief follow up meeting was held between the two Federal agencies **(the Service and the Bureau of Reclamation)** and the water agencies. This was an opportunity for the Acting Manager of the Service's California-Nevada Operations Office to express his concerns over the reliance on Federal legislation to resolve the Salton Sea issue. Some alternative approach which meets permit issuance criteria must be developed in the event that the legislation does not pass. Also, reducing the species list will facilitate the process from a workload standpoint. The Service agreed to provide a list of species to be reconsidered and to work with the water agencies in developing sound alternatives that will offset the impacts.

Two copies of the hydrological model results for the Imperial Valley were received on August 22, 2001. However, only the 12 year model runs were provided for the project. The 75 year runs have not yet been made available to the Service. One copy was forwarded on to CDFG. We were informed that the tables for the 12 year runs and the entire package for the 75 year runs will be provided once needed corrections have been made.

The group met again **to discuss the Salton Sea on August 29-30, 2001.** The first topic to be discussed was how to address pupfish using the drains that empty into the north end of the Salton Sea from the CVWD area. CVWD had envisioned a separate HCP for effects occurring in the north end. Another option offered by the Service is combining these effects with the IID HCP but have separate Implementing Agreements and permits. CVWD had some concerns over the legal ramifications of that approach relative to the QSA. IID explained that the environmental compliance has been separated based on effects associated with conservation of water versus effects associated with the use of conserved and transferred water. IID is responsible for effects associated with water conservation. They stated that they will take the responsibility for addressing these impacts using strategies developed for the south end. **Copies of the latest version of the pupfish strategies were provided (absent supporting text and a discussion of monitoring).** Land ownership was identified as a potential factor that could complicate implementing these actions. IID and CVWD will look at this aspect more closely, although they felt that the connections could be placed below any Indian lands currently under the Sea. We concluded the pupfish discussion with a reminder of the need for IID's actions to be compatible with CVWD's ongoing operations and to accommodate any increases in flows such that the habitat is suitable for pupfish in the extensions and connections.

There could also be impacts to adjacent wetlands and fish eating birds at the north end associated with a receding Sea. IID stated that they are intending to address the entire range of transfer options, including all of the water leaving the Salton Basin. However, the model results provided to date assume the CVWD will be the recipient of 100,000 acre-feet of the conserved water. We will need to see the results for the worst case scenario in order to evaluate the mitigation needs. CVWD concurred that they would not be able to receive any water until they had addressed the effects of use of that water, but they do not want to rely on the on-going multi-species efforts because of the potential for delays to extend beyond December 31, 2002. They are planning a separate HCP to address those impacts. The resource agencies will need documentation of how the responsibilities related to mitigation of the effects of water conservation at the north end will be addressed and how actions associated with receiving this water are not considered interrelated and interdependent. This needs to be provided in the form of a project description that draws the line between activities that are covered and those that aren't covered, and a justification for this separation needs to be included. The documentation also needs to identify where the effects of the receiving of water will be addressed, and all documents need to be available for review when the HCP is released. The Service concurred with the approach to address growth enabling/inducing effects through the regional multi-species plans.

Adjacent wetlands will be maintained or replaced as is called for at the south end of the Sea. The resource agencies identified two special cases that cannot be replaced with wetlands in other locations. These are Salt Creek and San Felipe Creek. The lower end of Salt Creek is occupied by pupfish and has emergent vegetation that has been used by Yuma clapper rails. Because of the pupfish occupation, IID will assure that it is maintained in place, possibly by creating a dam structure that will maintain water levels as the hydrological pressure from the Salton Sea does now. San Felipe Creek requires further discussion as we need to find a way to provide the San

Felipe Creek pupfish population a refugium from flood flows. Currently, pupfish may be washed downstream by floods and could be replaced by Salton Sea fish swimming upstream to re-occupy the marsh. If salinity gets too high in the Sea for pupfish survival, this source could be cut off from San Felipe Creek. We discussed the possibility of creating pockets off the main channel for pupfish use during floods to maintain the San Felipe Creek population in place. IID will develop measures to address these two special cases. Riparian habitat in the Whitewater Channel should not require replacement as CVWD believes these areas are supported by shallow groundwater.

In our discussion of the Salton Sea, the resource agencies expressed their concerns over the lack of appropriate off-site mitigation opportunities. Given fish-eating birds current dependence on the Salton Sea (particularly white pelicans), actions taken off-site would not appear to mitigate impacts at the Salton Sea. Mitigation actions either need to be compatible with restoration, or there could be a lag time to allow restoration to move forward (but this should be tied to the salinity increase and the time needed to implement mitigation). The resource agencies asked for the support of all the water agencies in seeing the restoration move forward. IID requested that we stay focused on mitigation, but it should not be in conflict with future restoration. The resource agencies indicated that it would be difficult to justify a 75 year permit for mitigation actions taken for only 9 years. The mitigation also needs to address a substantial portion of the lost use if it cannot address all losses.

We continued the meeting the next day with a discussion of the categorization the resource agencies had developed for the species on the proposed covered species list. Six categories were included: inadequate information, not present based on existing information, transient species with very limited use, other limited use species, species yet to be discussed, and those conceptually included in the HCP. The Service accepted comments from CH2MHill, and copies of the breakdown will be provided to IID staff at the next meeting. We briefly discussed the agenda for the next meeting with the principals from the agencies. We briefly discussed fallowing, and all acknowledged that this would minimize the anticipated impacts. The Service's preference is to avoid and minimize impacts first and mitigate as needed. With that we concluded the meeting.

Staff from the Carlsbad Fish and Wildlife Office attended **the joint State Senate - State Assembly Hearing on the Colorado River Water Use Plan on August 31, 2001.** The hearing began with a statement by the Regional Director of the Bureau of Reclamation Robert Johnson that provided the history of the California 4.4 million acre-foot apportionment. The Interim Surplus Criteria provide 15 years for California to bring its use down below this amount. **There are benchmarks to meet as soon as December 31, 2002.** The Bureau is moving forward with their responsibilities under the NEPA and the ESA relative to their actions that are part of this adjustment. The obstacles that must be overcome were deemed by the Bureau to be less than those already overcome by the water agencies. Questions were raised regarding the restoration of the Salton Sea and its linkage to the water transfer. The document that describes the alternatives for restoration should be released in the next few weeks. Use of conserved water for the Salton Sea is prohibited as part of the restoration. The primary issue facing the California Plan is environmental compliance associated with temporal impacts to the Salton Sea. The California

Endangered Species Act presents particular problems in regards to that statute's requirement that impacts be fully mitigated. The Bureau is aware of the legislative proposals, but it has no position on this approach. The Bureau is tracking other projects that are part of the California Plan including the linings of the All-American and Coachella Canals. Regional Director Johnson stated that progress was being made, but the decree (Arizona vs. California) will be enforced if California does not meet its obligations.

The four water agencies that are party to the QSA (IID, CVWD, MWD, and SDCWA) then provided testimony regarding their commitment to the agreement but concern over the time frame and compliance with the ESA for Salton Sea impacts. They are looking for legislation that will ease the burden of these requirements so that the process may be completed on time. Congressman Calvert who was invited by the State Committees to participate expressed his commitment to work with Congressman Hunter on his proposed Federal legislation, but he is very concerned about the fate of the Salton Sea. Fallowing as a means of conservation needs to be considered, and the community needs to be educated about the role of fallowing in this process. The Senators raised concern that support for State legislation is lacking, and the Administration has not expressed their support. The water agencies re-iterated their position that the legislation was the only way to meet the deadline. They did point out, however, that they are only looking for relief in regards to the Salton Sea. Other aspects of the transfer will be addressed as required by the laws. The Senators encouraged the water agencies to put more effort into pursuing the fallowing option. Beneficial use of the water could be maintained if it were used for soil leaching prior to release to the Salton Sea.

The Interim Surplus Criteria were also addressed in the hearing, but no additional statements were provided by the water agencies. Additional details were provided regarding storage and conjunctive use projects that will assist the municipal districts during times of shortage. MWD is looking at desalination as a potential option in times of drought. The Senators stated that they were looking for support for legislation from the local representatives and the Administration. In the remaining time, testimony was received from the Center for Biological Diversity and the Sierra Club. Both groups expressed their concerns over legislative bypass of endangered species laws and the potential for growth inducing impacts in the receiving areas.

Following the hearing on **August 31, 2001**, a meeting was planned with the Bureau's Regional Director, the Fish and Wildlife Service's acting California-Nevada Operations Manager, and the Principals representing the water agencies. Unfortunately, **the Principals were called away and could not attend**. IID provided the participants with presentations on the hydrological model for the Salton Sea. Some concerns were raised about the assumptions incorporated into the model, but it is considered conservative in that no changes are assumed that aren't reasonably certain to occur. A short discussion of fallowing followed the presentations as a potential minimization measure that would reduce the mitigation requirements. IID also provided a presentation on their mitigation proposal and cost estimates to address the temporal effects to fish-eating birds at the Salton Sea. The basic unit would be 160 acres and 8 feet deep; the cost for the entire network of ponds to be operated for 9 years is $3.3 - 7.2 billion. The options for the Sea appear to be limited

to what the legislation would provide, the expensive deep water ponds, or fallowing to minimize the impacts. Concerns remain relative to fallowing in that the existing agreement between IID and SDCWA prohibits fallowing, the community does not support it, and the concerns that the water would not be considered to fall under a beneficial use. The cost of the mitigation is not reasonable in IID's view, but the Service committed to re-evaluating the proposal to see if the costs could be reduced. The species list was discussed briefly after the IID and CVWD Principals had returned, and they were encouraged to reconsider the risk associated with several of the species. Of particular concern for coverage are those species for which adequate information is not available for analysis of the impacts. The Service is working towards a defensible species list. IID committed to taking this question to their Board.

The HCP group re-convened on **September 4, 2001**, to continue the discussion of the Salton Sea. The Bureau of Reclamation was also represented. IID acknowledged the emphasis on fallowing at the Joint Committee and hearing and stated that they needed to determine how to approach this change in direction. CDFG is working on gathering additional data on use of the Salton Sea by fish-eating birds. The San Bernardino County Museum has data from 18 years of surveys at the Salton Sea. We hope that this will provide a better basis for generating the number of birds we need to consider in our analysis. Charlie Pelizza, Senior Biologist at Sonny Bono Salton Sea National Wildlife Refuge, reminded the group that disease issues need to be addressed in any mitigation activities. Botulism is a big problem at the river deltas making these unsuitable locations for mitigation ponds. The ponds need to have adequate flow and drainage characteristics to minimize the botulism risk. We briefly discussed the temporal aspect of the impacts. The Service and CDFG are waiting on legal input in order to provide a resolution on this issue. We discussed the species list and how coverage could be provided for the entire list. The IID Board is not likely to be willing to drop any species. Adaptive elements would have to be developed for each. We also have to consider that it is only reasonable to split the available funding so many ways. Fallowing was discussed, but IID is concerned that it would not reduce the mitigation requirements enough. It is possible to add to the fallowing to free up mitigation water that would bring the changes in the Salton Sea back to baseline. If a credible argument could be presented that the changes with fallowing will be the same as the baseline, no mitigation for fish-eating birds in the Salton Sea would be required. The question associated with this approach was when could they stop doing the mitigation fallowing. It seemed logical that once fish were gone from the Sea, there was no specific benefit to fish-eating birds in continuing this practice. This will also be considered in discussions with the Solicitor. In regards to the 9 year interval, we need to look at worst case (all of the water leaving the basin) if this is an option they want coverage for. We also need to consider the confidence interval around those model results; this increment could possibly be 15 years rather than 9 years. We need to develop an appropriate means to address a temporal impact (9 or 15 years) in a permit that provides take for 75 years. The acreage requirements for an all fallowing approach would be approximately 80,000 acres. Additional fallowing of approximately 30,000 acres will be required for the restoration project. Because IID staff have not been given approval to move forward with fallowing, they have to proceed with the traditional conservation/mitigation approach. They have asked if they could provide mitigation options that would correspond to the different conservation approaches rather

than have a preferred approach in the HCP. This is another issue we will discuss with the Solicitor.

We met again on **September 5, 2001**. The topic of the meeting was scheduled to be tamarisk scrub, but we continued with the discussion of the Salton Sea and species list instead. The Service suggested that they consider the range of model results in developing their mitigation proposal and consider that it will be difficult to permit take for 75 years if the impacts will only occur for 9 years. We agreed that a long term effort makes more sense, but we need to know what is needed for a sustainable population and base the mitigation requirements on that. If fallowing is pursued, we will need to make sure that the strategies developed previously will not be affected. The analysis needs to incorporate these changes in habitat availability, particularly for the burrowing owl. The fallowed acreage would go from an average of 20,000 acres to 80,000 acres. This will likely include both permanent and rotational fallowing. We will also need to consider the possibility of a greater need for things like weed control. The connectivity of pupfish drains also came up, and the Service maintained that the connectivity actions were provided for in the strategy separate from specific impacts of the project to the Salton Sea. IID committed to maintaining this aspect given the "flagship" approach, provided there is adequate space to construct the connections. Mitigation water for the Salton Sea could be routed through the pupfish drains if needed to enhance habitat or improve water quality. The adjacent wetlands should not be affected, and the tamarisk strand along the Sea should be maintained by the availability of shallow subsurface water and the slow shift in the Sea's elevation. In regards to the species list, we need to have a defensible list that provides the resources agencies with assurances that they will be addressed adequately. Given the level of information available for some species, it is not clear that adequate funding will be available nor that appropriate conservation actions can be identified. CH2MHill will continue in their efforts to develop this approach.

We spent part of this meeting with CVWD on their HCP requirements. The Service and CDFG laid out for them what we will need to move forward on developing and HCP for their receipt of the water under the QSA. Several meetings were scheduled. The schedule requirements were not clear as it was not known if their HCP would need to be included in the packet to the State water Resources Control Board (SWRCB). If the time line is the same as IID's, it may be necessary to combine the HCP and NEPA documents with separate incidental take permits and implementing agreements.

On **September 11, 2001**, the group met to discuss tamarisk scrub. We began the meeting with a briefing on several topics including the status of the model 75 year runs. IID anticipates having those available within a week or so. The peer reviews have been requested from the reviewers, but those results are still pending. Thus far, only changes to the documentation have been recommended. The State legislation will not be approved in this session; it is hoped that it will be considered in the special session in January 2002. As a result of a letter from MWD to the Department of Water resources, there was concern about MWD's continued support of the QSA. This contributed to a lack of support for the State legislation which resulted in erosion of some support for Federal legislation. IID is anticipating some changes to the Federal legislation prior to

further consideration. The CVWD issue in regards to their schedule requirements remains, all are hopeful that this can be resolved in the very near future. The IID Board is not open to dropping species form the covered species list unless one of the receiving water agencies is willing to take on responsibility for any future mitigation requirements relative to those species. Discussions on this are expected to continue. The IID Board is open to fallowing as an alternative, but they are not willing to spearhead that effort in the Imperial Valley. They are looking for some other entity to take the lead.

We had a rather lengthy **review of the Pupfish strategy** relative to the addition of the drains at the north end of the Salton Sea. As a result the doubling of habitat will become its own measure, and the connectivity measure will become part of the Salton Sea strategy but its intent will be maintained. One issue that needs review is the presence of Indian land in the north and how this might limit IID's ability to provide for the needed connectivity. They will review the land ownership in the area. The 5 groups of drains to be connected were identified. We also discussed the need for more specificity in the pupfish study measure including the specific questions that are to be addressed by the study and a justification for taking no action at this time. In regards to moving pupfish out of harm's way for construction projects, we concluded that this requires trained personnel. The resource agencies will assist with the development of this training, and IID will have adequate staff trained to meet their needs under this measure. There was a lengthy discussion as to the appropriateness of developing guidelines for the specific actions to be taken, but concerns were raised that each project may require specific evaluation. It is hoped that coordination with the IT will occur as needed. CH2MHill will attempt to develop language that captures what was discussed.

For the remainder of the meeting we discussed **tamarisk scrub.** At the outset, IID wanted to distinguish between tamarisk impacted directly by construction activities and that impacted indirectly by the changes in elevation in the Salton Sea. The activities that may result in removal of tamarisk scrub have not been quantified in the document. IID does not anticipate activities in the river flood plains, but they do expect that most of the impacts will be associated with seepage recovery. The resource agencies will require some sort of estimate (at least a range) to cover these activities. We moved on to the strategy, and IID is focusing on the minimization associated with scheduling the activities outside the breeding season. They are still willing to replace native vegetation at 3:1, but they are concerned about the maintenance requirements if they also have to replace the tamarisk with natives. They provided a new approach which was to provide replacement tamarisk at 1:1, but this was not acceptable given that this is a non-native species that the resource agencies would not want to promote. IID also questioned whether there was really an impact associated with the loss of this acreage given how much was available in the Imperial Valley. It did not appear to be appropriate to dismiss this loss given the life of the permit, the number of species involved, and the potential acreage involved (approximately 500 acres). The resource agencies provided IID with a list of potential acquisition sites and were adjourned for the day. **We continued the discussion on September 12, 2001.** IID is concerned about the cost associated with this approach, and they are looking at a 0.25:1 ratio for acquisition. Such fractional mitigation by acquisition has never been approved in a 10(a) permit in our experience.

All that the Service can support at this time is a 1:1 ratio. We may be able to consider a lower ratio if new habitat is created. IID will consider their options and provide the resource agencies with an approach at a future meeting.

In regards to the tamarisk adjacent to the Salton Sea, IID is proposing to commit to a no net loss approach. The will monitor the stands and can redirect drain or river flows if necessary to maintain the scrub. This could result in shoreline vegetation ending up some distance from the shoreline, however. IID will evaluate the costs associated with an acquisition approach.

We began our discussion of **agriculture** at the same meeting on **September 12, 2001.** The main focus of IID's approach has been that the project results in the continuation of agriculture in the valley, and this is necessary for any of the habitats to be supported. The resource agencies still need an analysis of the two conservation approaches, however. Traditional conservation will result in construction of facilities or changes in field characteristics that are likely to have very minor impacts. Major shifts to different irrigation practices are not anticipated. The only direct impact that was discussed would result from power line strikes with extensions to lines to power pump-back systems. IID anticipated that most farmers would use diesel engines for this purpose, however. IID is willing to flag new lines to make them more visible. Other small-scale harassment impacts were also discussed. Fallowing poses a different problem. IID agreed to do an analysis of the acreage currently and historically fallowed and how this program would relate to those levels. In addition, we identified some key crops/management practices that should be evaluated in this analysis. These are: acres of alfalfa and acres of alfalfa grazed, acres of Bermuda grass (assuming all is burned as part of that crop's management), and the number of irrigation events that would occur with and without fallowing. This will allow us to evaluate the impacts to species using grazed alfalfa, burned Bermuda grass, and flooded fields preferentially.

A conference call was held between the Carlsbad Fish and Wildlife Office staff, CDFG staff, CDFG counsel, and the Solicitor's Office on September 13, 2001. We discussed the policy questions that had been generated by staff with the assistance of IID previously. Several issues were discussed that were **then reviewed with IID and their counsel by meeting/conference call that afternoon.** The issues discussed and the positions of resource agency legal staff are provided below:

- The HCP can have alternatives, but the Service will only be permitting IID for implementing one of those alternatives. The one permitted will be the least damaging of the feasible alternatives presented. This requires full disclosure of all alternatives presented.
- Mitigation was discussed, and there were concerns over the use of models to determine that impacts would occur only for 9 years when the permit was issued for 75 years. Some alternatives were discussed for approaches to address the continuation of fallowing for make up water:
    - flows to the Salton Sea would be maintained until the fish are gone or for the life of the permit if restoration has maintained the fish in the Sea
    - flows to the Salton Sea would be maintained for the life of the permit

- flows to the Salton Sea would be maintained for the life of the permit with a re-opener if restoration is in place and addressing the problem
- flows to the Salton Sea would be maintained until the fish are gone with a re-opener if restoration is in place and addressing the problem

The Service added that continuing the flows for the life of the permit would be appropriate in the volume necessary to keep the salinity curve at the baseline level given that there are potential impacts to species proposed for coverage that could occur at higher salinities (>60 ppt) as a result of impacts to invertebrate prey items.

- If fallowing is the chosen alternative, the agencies need assurance that the mitigation flows to the Salton Sea will occur even if there aren't enough farmers to fulfill both transfer and mitigation water needs. IID will work with the Bureau of Reclamation to guarantee this water.
- We determined that conditional coverage doesn't really apply to the species for which adequate information is lacking. There may be a mechanism to include those species pending the outcome of future studies, but the resource agencies must be able to remove them from the permit if the information gathered indicates that the HCP is not adequate.
- Temporal impacts are still considered take and need to be mitigated.
- Under the California Endangered Species Act (CESA), the fully mitigated standard requires mitigation actions for the life of the permit. CDFG staff will check to see if spreading the full mitigation that would be required for 9 years over the 75 year life of the permit (65,000 acres for 9 years = 7,800 acres for 75 years?) would be an acceptable approach to address this standard.
- The legislation as currently written seems to require the full paperwork process normally associated with HCPs. IID counsel concurs with this opinion.
- The Solicitor raised concerns about the appropriateness of a separate HCP for CVWD because impacts in CVWD's area would be a direct result of the of receiving water as part of the transfer. IID offered to make completion of their HCP a condition precedent of actual transfer of water to CVWD. The resource agencies will inquire as to whether or not this is adequate to separate the impacts from IID's project.
- The Solicitor was concerned about the nebulous goals of the HCP as currently written.
- Herbicide coverage is not appropriate in the HCP. This activity should be described in the EIS as part of the background, and all use should meet any applicable laws including all label restrictions.
- Minor impacts associated with conventional conservation can be addressed in the permit by limiting permitted take to low levels of non-lethal harassment. This will be provided for specific activities to occur in a specified amount of the HCP area.
- The loss of 500 acres of tamarisk was not considered insignificant and should be mitigated. The resource agencies are looking at the biological value of tamarisk to determine the appropriate ratio.
- The 1600 permit issue with the state has not been resolved and likely will not be resolved in our time frame. CDFG counsel requested that staff consider the requirements of that permit in their evaluation of the drain proposal.
- The Implementing Agreement (IA) needs to be drafted soon, and the Solicitor should

participate in this process. The draft IA should be circulated with the permit application and HCP.

- Service staff need access to the draft EIS as soon as possible. IID will begin providing portions of the draft as soon as they complete their review.
- Monitoring is key in a HCP that relies heavily on adaptive management. We need to get a framework developed soon.
- Changed circumstances will also need to be addressed in the HCP so we need to schedule that topic.

The Service concluded the meeting with a reminder that we need to see the re-writes of the various strategies as soon as possible.

We began the meeting on **September 21, 2001**, by expanding the number of meetings scheduled into October and November. **It is IID's intention to have a complete re-write of the HCP and a draft of the Implementing Agreement (IA) to the resource agencies on November 2, 2001. Chapters of the EIS/EIR should be available in the very near future.** The State legislation will be deferred until January. It is hoped that progress can be made between the State and interested environmental groups such that the language is acceptable when it is introduced. There will be a hearing on the Hunter bill on the Federal side in October. Given the recent events, however, action on the legislation is not anticipated. The Service was not able to provide any estimates on the pond alternative. We have received partial figures, but no comprehensive cost proposal has been possible to date. CDFG has identified to their legal staff what issues are associated with the mitigation proposals that have been discussed. The resource agencies need to meet at high levels to determine what the policy will be relative to the "fully mitigated" and the "minimized and mitigated to the maximum extent practicable" standards. IID will proceed with the alternative they want to pursue using the estimates that they have developed.

The remainder of the discussion focused on tamarisk scrub. The fourth strategy that was proposed in the draft was dropped because IID did not feel that there would be measurable losses associated with the types of maintenance covered in that strategy. These areas are regularly maintained, and any tamarisk present would be relatively small and scattered. Some adjustments were deemed appropriate to the estimated impacts associated with construction impacts covered in the first strategy, but the general approach was essentially the same. As a result of our discussion regarding timing of impacts versus the mitigation and net loss associated with acquisition, IID proposed the following approach:

- For native trees removed in conjunction with permanent losses, native habitat would be created or acquired at a 3:1 ratio,
- For tamarisk scrub removed in conjunction with permanent losses, native habitat would be created or acquired at a 0.75:1 ratio,
- If tamarisk can be created in advance of the impact, native habitat would be created at a ratio of 0.25:1.

For the seepage community associated with the East Highline canal, the situation is more complex because the vegetation is a mixture of natives and tamarisk. We reviewed that habitat values

provided by Anderson and Ohmart in their study along the Colorado River, and the median value would result in a base replacement ratio of 0.5:1. If the same approach is used, this would result in a replacement ratio of 1.5:1 if creation occurred after the impact or for acquisition. IID was looking for a way to keep this ratio at 1:1, and we suggested that they can present this approach. It would not be consistent with the first strategy, however.

The final category of tamarisk that needs to be addressed is the shoreline strand/adjacent wetland tamarisk scrub. It is not clear if this will be impacted as the Sea recedes or not, so IID is not inclined to do mitigation in advance of any sign of impact. The first requirement is to establish the baseline. For planning purposes, the University of Redlands database is the best information we have on the area that could potentially be impacted. IID is willing to do verification, but they are looking for a cap on their responsibility to mitigate in this category. Given that these figures are likely to be conservative, the database figures may be an adequate cap. The net total of tamarisk may not change in response to the project, in which case no mitigation would be required. If changes associated with a receding Sea occur, they could go in either direction. There could be a net increase in tamarisk, in which case IID would like their obligation relative to the other categories to be reduced. The tamarisk could decrease overall, in which case some mitigation would be needed. Replacing the water is not an option here. If the construction strategy was followed, they would implement replacement with natives at 0.75:1. IID inquired if a survey frequency of every 5 years might be enough to allow for planting of mitigation habitat prior to the actual loss of the tamarisk, in which case a ratio of 0.25:1 could be used. The drop in elevation in the first 5 years is expected to be 1.5 feet. **If a restoration project is implemented, it is IID's position that they do not have an obligation relative to changes associated with elevation of the Sea.** We briefly discussed monitoring and tamarisk as the final topic of the day. IID is willing to conduct baseline surveys of the tamarisk itself and to monitor any created habitat to assure that it meets the success criteria, but **they are not willing to monitor for covered species in the tamarisk or the created/acquired habitat because the mitigation is out of kind.** It is their position that meaningful comparisons could not be made. They suggested that the resource agencies monitor the created/acquired habitat given that this mitigation was their requirement.

The group met again on **September 24, 2001.** At this meeting we discussed a variety of topics. We began by looking at photographs of the seepage area along the East Highline canal and discussing mitigation of impacts in this area. We discussed the ratios for tamarisk and the mixed tamarisk/native stands along the canal. The value assigned to the mixed stands was a base replacement with natives of 0.5:1. This is based on the median value for mixed types in the Anderson and Ohmart 1984 study used previously in the canal lining projects. If mitigation is created up front (3 years from planned removal was acceptable to IID), the ratios would be **0.25:1** for replacing pure tamarisk with natives and **0.5:1** for replacing mixed stands with natives. If creation is not done up front or if habitat is acquired for preservation, the ratios will be **0.75:1** and **1.5:1**, respectively. The factor of three helps to offset the temporal loss of habitat associated with after the fact creation or the net loss associated with acquisition.

We spent the remainder of this meeting reviewing the monitoring approaches that have been proposed. The **burrowing owl** approach is acceptable; we are waiting for feedback on the length of the demographic study (somewhere between 12 and 15 years) and the number of nests that will need to be monitored to have acceptable confidence in our results. The **drain** monitoring calls for monitoring of vegetation (relative to the success criteria) and Yuma clapper rails only. The Service suggested that some verification of use by other covered species should also be included. IID agreed to note other covered species seen in the course of the clapper rail surveys. The outstanding issues associated with the **desert** monitoring are the success criteria to be used in re-vegetation and the incorporation of Couch's spadefoot toad surveys in response to thunderstorm activity in the appropriate habitat. The **desert pupfish** monitoring will require an accounting of the linear distance of drain available to them. IID already has figures for the drains in their current condition. Selenium will be monitored in the drains. There will be funds available to look at operations and maintenance procedures to identify minimization measures. No surveys are planned for the pupfish themselves. **Tamarisk scrub** monitoring will include monitoring of the condition of shoreline strand and adjacent stands. There will be monitoring of any created vegetation, and covered species surveys will be conducted prior to construction to avoid taking nests. No general covered species surveys are planned. **Salton Sea** was problematic in that it is difficult to assure that the make-up water is returning conditions to baseline. Such calculations are really only possible if all conservation is done by fallowing. Make-up water would not appear to work as a minimization measure under any other scenario, and it would only be used to addressed salinity (not elevation issues). Deep water ponds for mitigation would need to meet production criteria, and we would want to look at bird use. We explored the possibility of mixing alternatives temporally rather than spatially (fallow until the fish are gone, then install conventional conservation). IID may pursue this alternative.

On **September 25, 2001**, we met again and review some of the discussion from the previous day's meeting. We began with the Salton Sea strategy addressing **shoreline strand and adjacent tamarisk scrub**. The resource agencies and IID disagreed over the term of replacement habitat management. This is generally done in perpetuity, but IID is looking to implement this for the life of the permit. A monitoring methodology will need to be developed prior to permitting that will provide for an adequate ability to detect change. The resource agencies will also require an outline of the management actions that will be required to implement this strategy. IID is willing to conduct the vegetation monitoring to assure success, but they do not see the need to conduct covered species surveys given the mitigation is "out of kind". Some verification of effectiveness will be required by the Service, and there will be presence data for comparison from the baseline surveys. IID was concerned that not finding covered species would re-open the permit, and the Service suggested that some surrogate(s) species be used to demonstrate that the created habitat was providing for the desired functions and values. IID will develop language to lay out the goals and objectives in habitat terms. The length of the tamarisk monitoring does include the 95% confidence interval. In regards to how to define what mitigation is considered "prior to" the impact, the Service recommended that the definition be based on vegetation characteristics rather than a specific time. Three years was believed to be a reasonable estimate of the advanced planning that will be required, but a tree height/crown diameter or

similar measure would provide a better criterion. This definition may be different for losses from construction (sudden) versus losses from a receding shoreline (gradual).

We also discussed the **Salton Sea mitigation.** IID is planning on putting the 65,000 acres of fish ponds forward as one of their alternatives given the resource agencies have not really given them an indication that less than full mitigation will be accepted. IID has also taken the position that make up water should not be required for fallowing, fallowing provides adequate minimization on its own. IID is also not intending to proceed with any actions in the Salton Sea if a restoration project is authorized. IID is planning to develop a set of strategies that would address the range of impacts that would be associated with conventional conservation, fallowing for conservation, and a combination of both given that the IID Board may allow for some fallowing provided there is a cap. We briefly discussed some of the problems associated with a hatchery to put fish into the Salton Sea.

The Service Staff left that meeting to participate in a conference call (also **September 25, 2001**) between the California-Nevada Operations Office and the water agency Principals. The options they were discussing were deep water ponds for fish, legislation, and fallowing/shallow water ponds. Fallowing substantially reduces the impacts of the water transfer on the Salton Sea, and these could be avoided all together with the addition of make-up water. Water could come from fallowing or some other source, but the duration of the make up water is still being discussed. The Principals were concerned that there needed to be another alternative in case fallowing cannot be implemented in the Imperial Valley. The Bureau of Reclamation suggested that make-up water could be purchased. The Service sees getting us back to baseline as the most logical and least vulnerable way to offset the impacts. We have to permit the least damaging practicable alternative. We are looking for a second alternative, but it must be feasible and meet the Federal and State permit requirements. We discussed a hatchery and dikes around the river mouths, but both of these present additional problems. We also discussed identifying a dollar figure for mitigation, but there must be identifiable actions that will offset the impacts that can be implemented with those funds if a permit is to be issued. The water agencies have concerns that the Endangered Species Act just cannot accommodate their project needs. MWD also raised the requirements of California Environmental Quality Act (CEQA) as being significant as well. They offered a suggestion that the transfer be allowed to ramp up to 100,000 acre-feet while data is collected, and the mitigation will be determined after those studies. Given that fallowing has been implemented in other areas, IID will have to provide justification for not pursuing it in this case. The Bureau of Reclamation questioned if there was a jeopardy involved, but that issue is not the primary one. Without mitigation for impacts to fish-eating birds, the HCP does not meet the permit issuance criteria. IID raised concerns that there will not be broad support for the restoration outside the state unless this transfer moves forward. However, fallowing is an alternative that is compatible with restoration. The water agencies will need the second alternative in two weeks when the legislation is the subject of a Congressional hearing.

The group re-convened on **September 26, 2001,** to discuss the HCP IT. We began by laying out some of the responsibilities of the group. There will be a need for a dispute resolution process.

IID's counsel agreed to provide examples. The Service reminded the group that we cannot abrogate our responsibilities to a voting group. Where decisions focus on permit conditions, the agencies make determinations independently. The suggestion was made that the IT be allowed to function, but the agencies will be given veto authority as long as it is exercised in a timely manner (60 days). The IT will need to formally document their discussions and decisions. CH2MHill will develop a table of all of the measures that provides the specific actions, time lines, and where IT input/action will be required for planning purposes. We also revisited the topic of agriculture as a habitat. The HCP will need to describe the nature and extent of any anticipated impacts. This could be done on a unit system for conventional conservation then estimates of impacts valley-wide could be derived. Specific crops should be discussed in the fallowing alternative focusing on anticipated changes in grazed alfalfa and burned Bermuda grass as these are very important to the mountain plover. Special attention should also be given to the needs of the gull-billed tern given its dependence on agricultural lands for foraging. Nesting habitat needs should also be addressed. Lastly, the monitoring write-up needs to clearly state the goals, objectives, quantifiable measurements that will be taken, and the trigger points for adaptive management. CH2MHill will develop this as appropriate for the habitat being discussed. They see some areas as requiring no monitoring, others will only require compliance monitoring, and still others will require both compliance and effectiveness monitoring. A **revised HCP** is due to the agencies on **November 2, 2001.**

Staffs from the California-Nevada Operations Office (CNO) and the Carlsbad Fish and Wildlife Office traveled to Washington, DC to provide a briefing to the Acting Director and some of his staff on **September 28, 2001.** The Regional Director of the Bureau of Reclamation's Lower Colorado River Region was present to provide an overview of the history of and agreements involved with the use of Colorado River water in California. While Acting Director Jones' time was very limited, staff was able to relay information on the resources of concern at the Salton Sea. The briefing continued with the Assistant Director for Endangered Species, and we discussed whether the project should fall under section 7 or section 10. A federal nexus exists in the Secretary's approval of the change in point of diversion and the agreements involved in the QSA. Use of section 10 permitting was at IID's request. We discussed the possibility of having two alternatives in the HCP. The fallowing approach minimizes impacts, whereas conventional conservation would require a significant mitigation component. Outstanding issues include participation by CVWD for impacts associated with receiving the water, tribal trust interests have not been addressed, and impacts to the Refuge have not been addressed.

A conference call was held between the Service and the Bureau of Reclamation on **October 9, 2001.** The main topic of the call was **addressing impacts of the water transfer on Salton Sea species through section 7 versus section 10** of the Endangered Species Act. It was determined that a section 7 consultation is feasible given the Federal Approval that it required, and it would involve re-initiating the consultation conducted by the Phoenix Fish and Wildlife Office based on the change in geographical extent of the analysis. This re-initiation would only address the impacts to Salton Sea species and would not include the other species/habitats to be addressed in the HCP. The Bureau sees this as a one-time action that would not likely have a trigger for re-

initiation in the future. A future listing of the white pelican is one issue they hoped to be able to address in the future if the need arises. Consideration of the CVWD portion would be facilitated by conducting a consultation on the Salton Sea as part of this process. The direct impacts from increased flows in CVWD's area could also be distinguished from the growth facilitating aspects of receiving additional water. The greater concern for the Service was that IID may not have an incentive to follow through on the remainder of the HCP if the Salton Sea species are addressed through section 7 consultation with the Bureau. The Bureau assured the Service that they intend to see IID complete the HCP for their operational area. The Bureau is trying to find a balance between reducing impacts to the Salton Sea species and reducing the requirements of the current process. Given the magnitude of the problem, we will ultimately have to rely on the Restoration Project. It is not clear if fallowing will still be considered an alternative in the section 7 scenario. This alternative does minimize the impacts of the project, but it is not popular in the Imperial Valley. The farmers themselves may be more supportive of this alternative, however. We discussed a tentative approach that might be workable. However, the Service recommended that we defer on the section 7 process until after the draft EIR/EIS and HCP have been released for public comment. This would provide feedback on the fallowing alternative and whether or not it is feasible to pursue at this time. The alternative to fallowing in the HCP should include mitigation that IID and the other water agencies are willing and able to implement. We discussed matching mitigation options to the project alternatives. The species list will likely have to be reduced under any circumstances, but we discussed the possibility of developing a conservation fund to address unlisted species that would not be addressed under a section 7 scenario. **The Regional Director from the Bureau of Reclamation and the CNO Manager will be meeting with the water agency Principals to discuss these issues on October 12, 2001.**

Following the meeting on **October 12, 2001**, between the Principals and the Department of the Interior, a conference call was held to discuss with staffs the outcome of the meeting. The focus was on the Salton Sea as the other aspects are believed to be achievable under the HCP scenario. The group is looking for an administrative solution, and much discussion focused on whether section 7 or section 10 of the ESA offered the most logical, feasible approach. The water agencies were concerned that they would be held responsible for the restoration when their impacts are only temporal. Use of the Salton Sea beyond its designation as an agricultural repository should be the responsibility of the government. One problem has been the lack of a feasible mitigation alternative. Those described to date have not been adequately cost effective. Under either approach, the Bureau of Reclamation sees a need to reduce the list of species we are dealing with in the process. However, there aren't that many fish eating birds that use the Sea, but they occur in large numbers. IID saw the section 7 approach as including too much risk given that re-initiation could result in more requirements for them. IID is willing to consider a mitigation alternative, but they stated that more direction was required from the resource agencies as to what the agencies would accept as mitigation. One approach that was raised was the implementation of the on-site enhancements in combination with a conservation fund for white pelicans. It was not clear what the conservation fund would be used for nor what amount would be needed. The Bureau of Reclamation is open to the section 7 approach, but the Bureau is not able to assume all future risk. Finally, the water agencies asked if the project could conserve by

fallowing until all the fish are gone then convert to conventional conservation. There are other potential impacts that should be considered, however, given that this would not bring the project to baseline for the entire permit duration. The Service would not require actions beyond returning the Sea to the baseline condition. We will continue to work with our partners on the restoration for long-term actions to provide for white pelican use.

The working group re-convened on **October 17, 2001**. The Service began the discussion by reiterating that we need a mitigation alternative that the water agencies can implement in the HCP rather than the 65,000 acre alternative that is not manageable. CDFG is working on an approach that will meet their requirements. IID is still considering the concept of fallowing for the project until the fish are gone then converting to conventional conservation. The alternatives in the HCP document may or may not include make-up water depending on the feedback they receive from their attorneys. The Service and CDFG will get together to discuss bringing the two agencies' ideas together into something that can be shared with IID soon. IID is very anxious to receive this feedback; they consider the 65,000 acre option to be a placeholder until something more reasonable can be developed. IID provided an update of their review of the University of Redlands database on adjacent wetlands. Most of these areas are actually managed or will continue to receive water and are not expected to change with the project so this strategy will be dropped from the HCP. **Hard copies of Chapters 1 and 2 from the HCP and the Biological Resources section from the Draft EIR/EIS were provided by CH2MHill.**

The main topic of discussion was **changed and unforeseen circumstances.** CH2MHill has looked at the frequency and magnitude of earthquakes and feels that a magnitude 6.7 quake is the maximum magnitude that is foreseeable in the permit term. The HCP will consider changes associated with this magnitude quake or smaller relative to actions that would be required for the habitats covered in the permit. Of most concern was maintaining delivery of water to the managed marsh. IID felt that this size quake would not so impact their system that deliveries would be precluded. They will consider the managed wetlands to be highest in the priority for water delivery. Other circumstances that need to be considered for the managed wetlands are drought (reducing the water available), invasive species, hazardous materials incidents, flooding/tropical storms, and wildlife disease. In regards to this last issue, we recommended that IID be added to the communication system already developed to respond to wildlife disease incidents. Aquatic weeds could be especially problematic and should be monitored to promote early control. Fire is a concern in the desert habitat, particularly for any areas restored or preserved as mitigation. It appears that most changed circumstances apply more to created/preserved habitats than the avoidance measures provided for most strategies. The Service encouraged CH2MHill to use language directly from the regulations in describing the distinction between changed and unforeseen circumstances. They are no longer considering a percentage difference from the hydrological model as a criterion, and a new approach is being developed that will consider Colorado River quality. For each changed circumstance there will need to be a quantifiable trigger and a response action associated with it. Changes to the species status as well as changes to the habitats need to be addressed.

The burrowing owl strategy is already designed to deal with adaptive management, so IID will need to define what they see as an unforeseen circumstance based on the funding limit on this strategy. Given that a rise in the elevation of the Salton Sea is not foreseen by any of the models, this would be an unforeseen circumstance relative to the measures developed for desert pupfish habitat and connectivity. If this occurs as a result of restoration, the restoration project would be obligated to address any problems. The connections should be located such there is some flexibility to accommodate elevation changes. We need to define in the HCP what water quality changes are change circumstances for the pupfish and will be addressed versus those that are unforeseen. Besides water quality, impacts could occur to pupfish as a result of new exotic fish being introduced, fish disease (e.g., Asian tapeworm), and flooding affecting the drain cleaning frequency. Some basic level of surveys will be required in order to respond to any changed circumstances. To address the potential impacts of pupfish being washed out of the natural tributaries by floods into a Sea that was no longer suitable, it was suggested that IID could set up new refugium populations for those sites. This would be limited if a restoration project is put in place, and it may involve one of the agencies taking on the management of the pond.

The Service Carlsbad staff had a conference call with staff and the Regional Director from CDFG on **October 18, 2001**. The discussion focused on finding a mitigation alternative that could be implemented by phasing a combined hatchery and pond approach. The concept would be to begin by raising fish to stock the Sea once reproduction had ceased but while adults could still survive. As the survival salinity tolerance was reached, the pond construction would be implemented to provide habitat to maintain fish eating birds. The acreage of ponds is based on a temporal impact that is mitigated over the life of the permit. If restoration is implemented during the course of this phased process, funding would be redirected to support the restoration project instead. The basics of this proposal will be presented to IID at our next meeting.

The working group re-convened on **October 19, 2001**. We received a brief update on the meeting between the California Resources Agency and several environmental groups. The focus of that meeting was the California fully protected species. Some progress on that issue was made relative to the Salton Sea and lower Colorado River projects. A brief discussion of the two economics studies being developed by the Bureau and IID occurred. The primary difference is in the assumptions incorporated into the studies. It has not been possible to directly compare the results of the studies to date. The Service raised the issue of addressing tribal water rights. These issue are also depending on the QSA for resolution. The San Luis Rey tribes are to receive their water from conservation resulting from the canal linings.

The remainder of the meeting was focused on the Service and CDFG mitigation proposal. This included the basics of the proposal, how funding could be redirected to restoration if that moves forward, and other actions that should be carried out to minimize impacts to the Salton Sea. Fallowing with make up water continues to provide the preferred approach by avoiding impacts to the Salton Sea, but the mitigation was designed to address the temporal impacts caused by the project on a scale that can be implemented and that would be maintained for the life of the permit. Staff from the Sonny Bono Salton Sea National Wildlife Refuge raised concerns about the wildlife

benefits that would not be maintained at the Sea by this approach. While these concerns are valid, a smaller scale long-term project was deemed preferable to a short-term full scale project. The resource agencies have the option to continue management of the ponds after the permit term has ended. Specific trigger points will be developed that define where funding will be directed based on conditions in the Sea and progress on the restoration project. The Service is focused on addressing fish-eating bird impacts; CDFG would also like to see the loss of the sport fishery addressed by stocking hatchery fish in the Sea. We will also need to address changed circumstances that would apply to the hatchery/ponds. The full scale 65,000 acre option will be moved to alternatives considered but not carried forward. CDFG and the Service will continue to gather information to assist IID in developing cost estimates for the hatchery. Information as to the scale of the facility required is lacking as are operation and maintenance requirements. It is hope that some progress can be made on this effort in the next week. Refuge staff reminded the group that adequate water, labor, and other long term management requirements should be factored into the costs.

On **November 2, 2001**, the Service received three copies of the new administrative draft HCP via Federal Express shipment. However, the shipment did not include a draft of the Implementing Agreement as expected nor did it include any additional sections of the draft EIR/EIS.

The resource agencies and IID met on **November 13-16, 2001**. The purpose of this meeting was for the resource agencies to go through the new draft of the HCP and provide their comments to IID. Over the course of the four days, the group was able to go through the first four chapters of the HCP. The HCP did not include the new Salton Sea model results that were updated based on: new figures for salt coming in from Mexico, inflows from the drains that discharge directly to the Salton Sea, and the updated figures for salt precipitation. We briefly discussed the schedule, then went on with our page by page review. We discussed duck clubs and refuges in regards to water rationing. IID is willing to consider guaranteeing water to the State and Federal Refuges as part of the HCP. They determined that the coverage of duck clubs would be dropped. IID was reminded that other activities for the EIR/EIS need to be consistent with their commitments in the HCP. The Service suggested that they include an Executive Summary in the HCP. One aspect which came up in regards to several strategies was the interim period between issuance of the permit and implementing the actions called for in the HCP. IID committed to providing interim staffing of the biologist position, but there may be additional actions required to address this period for some of the strategies. We discussed that the HCP IT should not be a substitute for actions that should be provided in the HCP and that it cannot abrogate any resource agency responsibilities. The Salton Sea analysis needs to include an analysis for each of the covered species listed for that habitat. We discussed the role of the Restoration Program, and IID decided that they would prefer to address this program in a separate section in Chapter 1 rather than try to incorporate discussions throughout the document.

Some additional issues that came up in the discussion include the need for standard language to address conservation easements. We need to define the criteria that allow habitat creation to be considered advance mitigation so the lower ratios can be used. The implementation of measures

for the term of the permit rather than in perpetuity is also an issue that needs to be resolved. IID agreed to discuss the other Salton Sea projects put forth by CVWD and the Pacific Institute in their discussion in the EIR/EIS. What is still lacking in the HCP is a discussion of alternatives to the takings and why they can't be implemented. This includes fallowing for make-up water under the fallowing alternative. In the discussion of the Salton Sea, the question was raised as to whether we have a palatable alternative among the three presented. Given that a demonstrated ability to provide funding is necessary for the permit, we will need to address this issue. The individual species analyses throughout the document need to be checked for consistency, and the document should not overstate benefits and de-emphasize impacts. The lack of detail in the current monitoring and adaptive management plan is still a problem. We need more definitive information on how emergencies will be handled and how they could affect covered species. The Service provided a copy of the Regional Office's preliminary comments. This included the need to reconsider their approach on changed versus unforeseen circumstances as right now most of the potential events are in the latter category. The last problem discussed was that it could be difficult to reconcile one set of alternatives in the EIR/EIS with another set in the HCP. This will need to be resolved. A list of action items was developed, and the group adjourned.

Following the morning HCP meeting on **November 16, 2001**, a meeting was held between IID and engineers representing CDFG and the Department of Water Resources (DWR). In response to IID's cost estimates for the 5,000 acre pond/hatchery option, CDFG had developed it's own estimate for the ponds based on an above-ground approach rather than an in-ground approach as was included in IID's estimate. CDFG's initial cost estimate was on the order of $10 million dollars for construction of the ponds only. IID was concerned that the two proposals were not equivalent and therefore their costs could not be compared. IID provided several concerns to CDFG staff that were then forwarded to the CDFG engineering staff. The objective in both cases was to get a "pre-feasibility" cost estimate to use in discussions between the water agencies and the resource agencies. There were many aspects of IID's cost estimate or that IID deemed appropriate for the CDFG proposal that were not initially included in the CDFG estimate such as land costs, water costs, armoring on the levees, and pumping costs. The group discussed the need for land costs to be covered if IID owns the land (it is a joint project, and IID should receive credit for this contribution), the difference in water costs associated with use of agricultural fields (has a history of use so water should be available at the agricultural rate) vs. water costs with reclaimed Salton Sea bed (water would have to be conserved to be made available and therefore would cost the conserved water price), and maintenance of a gravity-flow (in-ground) vs. a pumped flow (above-ground) approach. Water delivery costs could be higher if the delivery exceeds the design rate of the IID facilities. The use of drain water was discussed as a cost cutting measure, but this would require additional monitoring and may require blending of delivery and drain water to maintain the appropriate water quality. Additional infrastructure would be required to accommodate this.

As a result of including costs for most of the items included in the IID estimate, the CDFG pre-feasibility estimate was approximately $175 million for construction and maintenance of the ponds (the associated hatchery costs would be extra). The IID cost estimates, which included estimates

of the hatchery costs, ranged from $350-800 million. On the low end, the estimates now differ by a factor of 2 rather than a factor of 35.

The group met again on **December 14, 2001**, to discuss the preliminary draft EIR/EIS. We started with a discussion of the schedule for the document and the public hearings. Three public hearings are planned. One issue of concern was the intention to address comments given orally at hearings a general response whereas the Service has always considered oral and written comments to be equal warranting specific responses to both. We continued with global comments on the document. CDFG stated that as their CEQA compliance for the 2081 permit, the document will need to describe the take with species specific discussions that link the potential take with the HCP actions. The HCP alternatives should also be separated from the project alternatives. Operations and maintenance are not describe under any of the alternatives but need to be if we are to use this document as CEQA or NEPA compliance for the permitting of take associated with these actions. The HCP alternatives need to include an alternative to the take. The No Project still includes operations and maintenance and thus would not be equivalent to a "no take" alternative. CDFG stated that the document does need to address fully protected species, and more work is required to analyze the impacts to the sport fishery and socioeconomic aspects of the sport fishery. The document needs to clearly state the purpose and need for the Service in addition to that for IID and the Bureau. The water quality section should be consistent in its use of Salton Sea modeling results, and the assumptions incorporated into the drain water quality modeling should be clearly stated so that the reader can understand such results as the selenium concentrations under all alternatives and the baseline decreasing over recent sampling results.

We discussed the various alternatives for the Salton Sea provided in the Technical Memorandum included with the document. After some discussion it was agreed that the "Risk Sharing" alternative was a funding mechanism rather than mitigation for the Salton Sea and should not be included in the Salton Sea alternatives. The tri-delta alternative is going to be addressed as an alternative considered but not carried forward so that it is at least discussed within the document. IID did not want to delete the 65,000 acres of ponds, but they are willing to use this discussion to guide the reader through the calculations that resulted in the 5,000 acre option. The second Salton Sea alternative will be fallowing. IID is concerned that they will not be able to provide a project level evaluation for these alternatives and may need a supplemental document. It was decided to proceed with the most thorough discussion possible and address the need for a supplemental document in the future. We also discussed the need for a more thorough evaluation of the interaction between the water transfer and the Salton Sea Restoration Project. The Bureau should be able to provide information on changes in the scale of restoration even though the Alternatives document has not been released.

CDFG staff from Blythe joined to discuss the lower Colorado River sections. They had only received a copy of the document on **December 13**, but they had many concerns about it. The document did not incorporate a discussion of measures to comply with the Fish Screening Policy. This is needed to address the take of fully protected species. The change in point of diversion does trigger the need to address this issue. CDFG also felt that issues that had been discussed

previously with SDCWA and MWD had not been incorporated into the project as they had anticipated. The biological opinion developed by the Service's Phoenix Fish and Wildlife Office does address some of the impacts to LCR species, but CDFG does not believe it reduces the impact to below the level of significant. The EIR should address sensitive species as well as those that are required to be addressed under CESA. Their conclusion was that in its current form, the document would not be adequate for CEQA coverage of permit issuance for the LCR species.

On **December 17, 2001**, the Bureau held a conference call to discuss the EIR/EIS, and the Service was invited to participate. The Bureau's Regional Office did not want the 65,000 acre pond alternative to be discussed in the document. The Bureau's technical staff was concerned about the assumption incorporated into the model that CVWD would get 100,000 acre-feet/year of water even without a transfer from IID. CVWD has stated that they would seek this additional water out should it not be available from IID, but the Service questioned whether that was adequate to consider such volumes to CVWD reasonably certain to occur. Some of the Indian tribes are concerned about power generation losses and various other trust assets. The Bureau is planning on developing this part of the document. Section 1.8 also needs to document the consultation that has been conducted with the Tribes. Consultation on the HCP is still pending. The Service and the Bureau will make an effort to address this issue during the public comment period.

A lengthy discussion ensued over the economic analysis in the document. The Bureau's economist was concerned that the document only portrayed a worst case scenario rather than providing a more modest scenario for job loss based on fallowing of hay crops. This is a very important issue to the Bureau's Regional Director.

The Service raised several issues of concern. A determination of less than significant is not the same as significant but mitigable. These are different and should be portrayed as such in the text and summary tables. There needs to be an alternative to the takings, but the proposed listed species only alternative is problematic. The Bureau would like to see this maintained as a place holder for the section 7 option. The Service would prefer to see a reduced species list for the HCP as we may not be able to permit take of the 25 species that are lacking good information. Transfer volumes are project alternatives rather than HCP alternatives as IID has never offered to reduce their conservation volumes as part of the HCP negotiations. Impacts of permit issuance and HCP implementation should be analyzed in every topic area within the document. This includes economic impacts of fallowing for mitigation water and taking 5,000 acres out of production for ponds. Overall the Service is concerned with the lack off time for a thorough review and the lack of a final review of all changes in the HCP document.

The group agreed that a minimum of two months would be needed for a thorough update and review of the EIR/EIS and HCP. The Bureau acknowledged that the State Water Resources Control Board (SWRCB) petition schedule would not accommodate that kind of delay. Given the schedule we are likely to have many issues to be resolved in the final document. The Service would like to work with the Bureau on presentations for the public hearings.

A second conference call was held on **December 18, 2001**, that included the Bureau, the Service, IID and CH2MHill. All agreed that the 65,000 acres of ponds should not be a formal alternative, but IID was not willing to remove it from the document altogether. It will be included as background information for the 5,000 acre pond alternative. This alternative will be addressed programmatically given that many details have yet to be worked out. The Bureau wanted to maintain flexibility in how it would be implemented given that the water requirements are substantial. Supplemental assessment of this aspect could result in future delays.

We discussed the need to address the difference between SDCWA and CVWD getting the water, but IID stated that they were using this assumption based on CVWD's position that they will obtain the water from some source. Most of the differences occur after fish are no longer expected to be present in the Salton Sea. The Bureau reminded IID and CH2MHill that the assumptions must be clearly stated so the reader will know what these assumptions are. It would be prudent to be prepared to provide the modeling without this assumption in the Final EIR/EIS given that we don't have a worst case depiction of the Salton Sea under the proposed project without it.

The Service will have our Regional Tribal liaison begin consultation during the public review period with the Indian tribes that may be affected by the HCP. The Service normally addresses the National Historic Preservation Act as well, but this does not appear to be an issue in this case.

The Bureau was very concerned about the lack of evaluation of the fallowing of hay crops only in the socioeconomic analysis. IID countered that they are not going to require growers of specific crops to fallow; the program would be open to all farmers that are interested in volunteering for the program. They have provided the entire range of economic impacts from job gains through construction of water conservation measures to the jobs lost through fallowing of crops in proportion to their production. The Bureau was concerned about inconsistencies between the water transfer and the Restoration Project, but their plan calls for the purchase and conversion of land to solar ponds. They do have the ability to limit the lands considered. IID agreed that it was likely that the least valuable crop would be fallowed, but this is dependent on market conditions. It may not be hay crops that would be considered the least valuable. It was suggested that the discussion focus on the voluntary nature of the program.

We discussed the conclusions provided in the Biological Resources table and the fact that they did not appear to be consistent with the text. CH2MHill staff stated that this issue had been addressed in the updated version. The lack of significance attached to the loss of the fishery as a non-native fishery will be reconsidered.

The HCP alternatives have been modified, and the listed species only alternative is out. The alternatives for the HCP are now the same as the project alternatives. The Service reminded the participants that a "no take" alternative is required, and CH2MHill stated that they would attempt to address this issue in the draft that goes out. Each alternative will have two approaches for addressing impacts to the Salton Sea: ponds and mitigation water. Make up water could come

from fallowing or additional water conservation. The socioeconomic analysis will incorporate the amount of fallowing required for this option. All sections have the HCP impacts incorporated.

The Service relayed concerns that CDFG had expressed at our meeting. IID stated that SDCWA and MWD are working with CDFG to resolve the LCR issues. The species specific analysis of take will not be possible in the draft, and they are working on having that in place for the final document. It was made clear that the Bureau will develop any additional documentation required to implement the LCR conservation measures, and SDCWA and MWD will provide the funding.

We discussed the need to use a baseline that incorporates those actions that will occur on the LCR both in that model and in that input into the Imperial Valley and Salton Sea models. Comparison to existing conditions given the changes that are anticipated is deemed inappropriate by the Bureau.

CH2MHill has identified two additional significant, unavoidable impacts in their analysis. There will be significant, unavoidable impacts to Farmland of Statewide Importance under the fallowing scenario given that rotations of 4 years or more is considered to be conversion under that designation. This does, however, provide IID with the maximum amount of flexibility in implementing the program. No zoning changes are anticipated at this time. They have also identified a significant, unavoidable impact to air quality as a result of fugitive dust from exposed seabed of the Salton Sea. While this is a conservative designation, it is necessary given there are no data to support that such impacts will not occur. No mitigation for this impact has been identified.

Following the conference call on **December 18, 2001**, the Service had a brief discussion with IID on the modifications to the language in Pupfish Strategy 2 that we had recommended to avoid a potential jeopardy for the desert pupfish as a result of selenium contamination. IID expressed the concern that the language seemed to require them to carry out actions before it was demonstrated that there was a problem. The required 4-day average sampling has not been performed. IID provided some changes to the language by close of business that day. On **December 19, 2001**, the Service provided some minor modifications, but the extension of implementation from 5 years to 7 years was maintained. IID responded that while the changes were minor, CH2MHill was no longer accepting changes to the HCP. This will have to be addressed in the final document.

The group re-convened for a two-day session on **January 17 & 18, 2002.** The wildlife agencies acknowledged that both will likely need to provide official comments on the EIR/EIS to assure that our concerns are recognized and addressed. We discussed the need to receive a permit application and what must be included in the package: the HCP, the IA, the monitoring plan, and the actual application itself. This must all be available for public review at some point. We discussed the additional steps associated with processing the permit on the Service's part: an internal consultation and biological opinion, findings, the Incidental Take Permit, and a Record of Decision (ROD). Frequently, the findings, permit and ROD are all signed concurrently. We discussed the necessity of separating the CEQA and NEPA processes given the ROD will not be

completed until late in the process but the State Water Resources Control Board (SWRCB) process will require a Notice of Determination (NOD) much sooner. We discussed the need to reconsider the decision to keep the 25 species for which adequate information is not available on the covered species list. It will require additional work to retain each of these species, and it is not likely that we will be able to provide coverage for these species in the permit. Withdrawal of these species could be incorporated into the Final EIS and HCP documents.

Lianne Ball of the Service's staff gave an introductory presentation on monitoring and adaptive management. She provided a set of definitions that can be used as we continue our discussion of monitoring topics. The monitoring program should be more than just counting individuals. Our goals should drive the development of specific monitoring questions that are then addressed through hypothesis testing. Adaptive management requires that alternate hypotheses be evaluated followed by implementation of the most effective management technique.

We then began a discussion of the drain monitoring in the context of the presentation. CH2MHill provided a flow chart to represent the process for monitoring the created marsh habitat. Although we had agreed to focus on the clapper rail as our "flagship" species in this habitat, we agreed that we should not lose sight of the fact that we are proposing coverage for other species as well. We should consider their needs in developing the creation and management plan for this HCP component. Additional baseline surveys were added for years 7 and 12 to provide for the adaptation of the Phase 2 and 3 designs to up-to-date mitigation needs. The discussion then focused on effectiveness monitoring and how the results of the surveys would be used. Given the differences between the drains and the created habitat, there was some concern over our ability to directly compare between them and set numeric goals based on the baseline surveys. One possibility is to compare surveys of the created habitat to covered species numbers/densities (particularly Yuma clapper rail) on the State and Federal refuges. Compliance monitoring will be needed to demonstrate that IID has met its commitments in terms of the acreage, type and structure of the habitat created. Performance standards for the vegetation will be developed as part of the creation and management plan. These will result in more discrete parameters that can be measured. IID is not comfortable with a numerical goal for any of the covered species, so the group developed a set of parameters that the IT will consider in evaluating the results of the surveys. We identified the need for IID to state what parameters they are willing to adjust as part of adaptive management and what parameters would be the responsibility of the wildlife agencies (under the No Surprises Policy) if future changes were deemed necessary. That information will be provided prior to our next meeting.

We briefly discussed the addition of coverage for entrainment of Colorado River fish (razorback sucker in particular) to the HCP and permits. IID recently learned that this take was not covered by the existing biological opinions between the Service and the Bureau for the lower Colorado River. This is a new aspect that was not addressed. The Service will have to discuss this with the Phoenix Fish and Wildlife Office as they are the lead on lower Colorado River issues.

We discussed monitoring needs for the razorback sucker. This discussion was exclusive of the issue of entrainment. A conservation strategy has been proposed for this species relative to the main delivery canals and associated reservoirs only. The approach is to collect, transport, and release to the Colorado River any razorback suckers found in the course of drawing down the main canals or reservoirs. The monitoring will address fish survival through the collection and transport to the Colorado River. Long-term survival will not be monitored as part of the HCP.

We began a discussion of the tamarisk scrub monitoring. This has some similarities to the drain/marsh monitoring given that the created habitat will differ from the impacted habitat. In this case the structure and the species composition will vary as a result of the requirement to replace lost tamarisk with native species. We have a similar need for IID to provide a breakdown of what they will and will not provide for under adaptive management. We also need to develop a similar process for evaluating survey results here given that the baseline surveys will be conducted in tamarisk versus the native tree habitat provided as mitigation. IID is again concerned about attempts to directly compare the numbers of covered species between the two areas. As for the drains, guidelines for the IT need to be provided in the HCP. To the extent possible, the results of covered species surveys in mitigation habitat will be considered in future acquisition or creation.

The group reconvened on **January 22, 2001**, to develop a schedule of activities based on the various processes that must be completed by December 31, 2002. Most of the scheduling requirements are based on the SWRCB process. This results in a very ambitious schedule at least through the Final EIR/EIS. The ROD for the Service and the Bureau will need considerable additional time to complete the ESA requirements, and the CESA permit also follows the completion of the Final EIR. The **comment period does not close until April 26, 2002**, and the **NOD is needed by the SWRCB to start their process by June 3, 2002.** The result of these scheduling requirements is a very limited window to complete the responses to comments. **All permits must be signed by December 2, 2002** to allow time for completion of the QSA documents by December 31, 2002. The group will be working from now until the close of the comment period to resolve the remaining agency issues with the HCP (and EIR/EIS). The Service process requires that a Notice of Receipt of Application go out once we have the application package (application, HCP, IA, and monitoring plan). This is planned so that the public review can run concurrent with the last third of the public comment period on the EIR/EIS and HCP. This would need to be distributed to all of the recipients of the EIR/EIS and HCP. One very large outstanding issue is a decision on the approach for the Salton Sea. IID has targeted **May 7, 2002 as a goal for having made the decision.**

The group met again on **January 28 and 29, 2002.** The discussion began with the topic of drain habitat monitoring. Compliance monitoring is focused on IID meeting its commitments, but the requirements of effectiveness monitoring are less clear. The drain surveys will only be conducted through year 12, so there will not be an opportunity to compare the drains and the managed marsh throughout the term of the permit. We reviewed the guidelines that were developed for the HCP IT to consider in evaluating the covered species survey results, and the group felt that we were headed in the right direction with that process. Adaptive management will be possible

within the limitations set by funding and the excluded actions to be documented in the text. A cap will also be set for water that will be available to the created habitat. This is of concern because we may not have a good baseline to determine water needs. The Sonny Bono Salton Sea National Wildlife Refuge (SBSSNWR) currently does not manage habitat for the variety of covered species in the HCP. Their current water use would be less than what would likely be required for the created habitat if we include a component for the California black rail because bulrush habitat has greater water requirements than the marsh currently managed for Yuma clapper rail in which cattails predominate. The SBSSNWR also identified some infrastructure requirements that should be incorporated into the design of the managed marsh.

The next major topic in the meeting was the quantification of the take. There will be stated acreages in some cases that can be used to quantify take. This is still problematic given that we have very little occurrence data for the covered species with which to analyze the impacts of that take. In some cases that exact acreage is not clear at this time (e.g., shoreline strand), and in other cases we aren't working with acreage figures at all (e.g., canal operations and maintenance in desert habitat). CDFG is looking at the possibility of developing estimates of the take and deriving mitigation acreages for the covered species so that the "fully mitigated" standard under CESA can be met. The Service will seek input from the Solicitor as to how best to provide for quantification of the take allowed by the permit. Another question that came up during this discussion is how this take that is so difficult to quantify will be monitored. Some of these species would be very difficult to detect if injured or killed making monitoring of the take very difficult. This issue has not been resolved. IID is very concerned about the possibility of exceeding the permitted take.

We continued our discussion with the topic of tamarisk scrub monitoring. We concluded that in this and the drain habitat category we would place the vegetation monitoring under compliance given that developing habitat characteristics in the created habitats is part of the commitment in the HCP. Compliance requirements relative to acquisition under this habitat type include: agency approval of the property selection, documentation of the acquisition, and documentation that the appropriate management is being implemented. Effectiveness monitoring will include general bird surveys. Relative abundance as a component of effectiveness will be dropped from the goals for all habitats/species. Baseline surveys will not be conducted in the tamarisk scrub so evaluations of the species survey results will consider the results of other studies within the local area and region. Because some of the covered species occur in the area only rarely, the HCP IT will also consider use by similar species or species with similar habitat needs in their evaluation of the effectiveness of the replacement native tree habitat in achieving the goal of the HCP. Surveys should continue throughout the permit term (albeit at a lower frequency than during establishment of created habitat). IID will have a list of actions that are excluded from consideration such as additional water for habitat beyond the original budget and a change in properties as mitigation after property has been acquired. Cowbird trapping can be considered provided it is within the management budget, but IID was not open to it as a requirement of native tree habitat creation.

The group meet on **February 7, 2002.** We began with a brief discussion of the phased mitigation approach for the Salton Sea. The resource agencies expressed their concern that the water requirements had not been addressed appropriately, and IID agreed that this needs to be resolved. If they exceed those figures being used, it may require that they be located where some or all of the flows out of the ponds could be reclaimed. They concurred that the new model results have raised the acreage requirements to 6,333 acres with the target fish production still at 500 pounds/acre so the acreage must be limited to wet acres only. The acreage of the ponds also need to be increased to allow for regular maintenance of some ponds. We will also need to determine if food supplementation will be required given this could have a major impact on the costs associated with this approach.

The main topic for the day was changed and unforeseen circumstances. Staff from the Service's Regional Office joined the discussion by phone. The general approach in the document is that IID has a very strong incentive to re-establish their water deliveries following the types of events discussed, and they don't believe the system would be out of operation long enough to have a significant impact on covered species. Therefore, any thing that is large enough to significantly impact covered species is unforeseen. The Service did not see this as an appropriate way to define these concepts. IID has never had a break in their deliveries lasting more than three days. They do not believe they should have to address something that has not occurred in their history. The Service encouraged them to make this a commitment in the document if they have no evidence to suggest that it will be exceeded. There are several examples in the text that state that water deliveries will be re-established, but they do not indicate that other corrective actions will be taken to address impacts to covered species (e.g., replanting vegetation in the managed marsh). IID stated that their intent was to take the action necessary to maintain the function of created habitat. This needs to be expressly stated in the document with examples of the types of actions that will be implemented in response to the events discussed. Changed circumstances need to be specifically addressed. This includes a budget component so that they agencies can determine if this aspect of the HCP can be implemented. The term "operating budget" does not make it clear that there is adequate funding to address other events beyond day to day activities.

We discussed toxic spills and the need for Emergency Response Plans that address the HCP as well as human health and safety. The habitat creation plans should include an emergency response component. The HCP biologist needs to be tied into the IID response network. The process needs to include: pre-spill planning, response activities that consider the requirements of the HCP, repair of any physical damage, and mitigation of covered species impacts based on post-spill monitoring. We also discussed fire, which could affect the created habitats. IID is looking at inserting a blanket statement that they will address impacts to the created habitats in order to return them to a functional state. A topic that needs to be added is parasites. Management funding needs to include standard measures to address bird disease, particularly botulism. IID is willing to address all of these issues in the mitigation sites, but they are not necessarily agreeing to address those throughout the habitats, in particular in the broader desert habitat. They will reconsider some of the language in the text. The intent of their approach needs to be clarified and

independent. Coordinating with the State and Federal facilities is appropriate, but reductions in management at these facilities due to budget constraints does not reduce IID's responsibilities.

We ended the meeting with a discussion of quantification of take. Given that this is a "management" HCP rather than a land development HCP, it is more difficult to quantify take. Under the CESA, a permit issue under section 2081 normally must quantify the take of individuals. If we can't develop some means to assess the take, it may be difficult to permit. IID objects to dropping species given that they feel that they are doing additional mitigation to address all of these species. They are aware with the difficulty with the list of 25, but they were working under the assumption that the others would be covered. The resource agencies will look at the impact analyses and try to evaluate if there are others that will not receive coverage.

On **February 8, 2002**, the Service and the CDFG met to discuss issues related to quantification of take. We began by reviewing individual species and determined that some categories were developing as a result. We did not get through the entire list of 71 species (we deferred on the 25 species discussed with IID previously), but we did identify approaches for the desert species taken as a result of canal maintenance activities. It appears that some additional species should be dropped on the basis of a lack of evidence for occurrence (e.g., elf owl) or a lack of anticipated take (e.g., golden eagle and ferruginous hawk). We agreed to continue our review and compare notes next week.

The group met again on **February 14, 2002.** We began with a quick review of the outstanding HCP tasks. We then proceeded to discuss comments on the drain monitoring re-write. The major issue associated with this discussion was what triggers agency approval and what does not. We determined that it would be appropriate to require agency approval for management actions that are outside what was proposed in the management plan. Any adaptive management options covered by the plan would have already gone through an agency approval and can be implemented at the discretion of the HCP IT. This led to a discussion of how the IT will function, and the group agreed that all efforts should be made for the IT to reach consensus. Veto authority will remain for the agencies. The need for long-term vegetation monitoring was also discussed. This should be planned for given that the agencies will be looking for some means to document that the success criteria are being met throughout the course of the permit. This was also true for the tamarisk scrub category. The group agreed that the general procedure outlined for the drain habitat monitoring should be carried over to the tamarisk scrub as well. For both habitats, we will need to define a water budget that includes adequate water to address all of our adaptive management options and changed circumstances. The desert monitoring is still lacking a monitoring component for the restoration/acquisition aspect in addition to the avoidance/minimization component that has already been addressed. This will be developed following the general paradigm used for the other habitats. One issue that still remains is the duration of the responsibility: perpetuity or the term of the permit. This still needs to be resolved.

When we re-convened on **February 15, 2002**, we chose to focus on the phased mitigation. We need to develop much more detailed specifications as all were concerned that the current cost

estimate of $110 million is too low. The water agencies would like to maintain both options for the Salton Sea through to the ROD rather than identifying their preferred alternative in the Final EIR/EIS. This is problematic for the resource agencies in permitting. We acknowledged this as an issue and continued in our efforts to identify more specifically what would be required to implement the phased mitigation approach. There are essentially three phases to this approach: the hatchery only phase, a transitional phase, and the pond phase. During the hatchery phase, we estimated that over 63,000,000 fry would need to be released annually to the Salton Sea to achieve a 3,200,000 pound production of forage size fish. This requires a spawning facility that includes breeding ponds, grow out ponds, netting for the grow out ponds, and food for the fish in the grow out ponds. Some means would be needed to blend water such that the fry could be produced at or below their salinity tolerance, but that they could be brought up to the salinity of the Sea prior to release. Multiple release points may be needed to reduce predation on the fry stage. It may be more cost effective to maintain the fish in controlled conditions to a larger size ("stockers") to increase their survival. This hatchery phase would include tilapia as a forage fish and the other three sportfish present in the Salton Sea. During the transition phase, additional grow out ponds would be added to get the fish to stocker size prior to release into the ponds (if not already done), and the ponds themselves would be constructed. The sportfish hatchery would be phased out at this time. If deemed appropriate, a different species of forage fish may be used for the ponds phase of the mitigation given the temperature sensitivity and other problems that may occur with tilapia (e.g., disease). The production requirements would be the same in this phase as it was for stocking the Salton Sea. To minimize disease and contaminants issues, canal water would be used. Given the potential water requirements (the actual volume is still being determined, but may be on the order of 100,000 AFY), it may be necessary to place the ponds higher in the delivery system where the conveyance capacities are higher. Some kind of fertilization or nutrient supplementation will likely be required given that canal water is what is being discussed. We also discussed the possibility that aeration will be required.

We completed the meeting by continuing our discussion of the IT. The funding will be provided on an annual basis, but it would be reasonable to have a contingency fund set up at the beginning to address larger adaptive management changes and/or changed circumstances. The IT will be staffed by IID, the Service, and CDFG. The Implementation Biologist (IID Staff or contract) will not be a member of the IT, but that individual will report to the IT. Every effort will be made to reach consensus on issues, but there may be cases where that is not possible. In those instances, the staff of the agency which does not agree will elevate the issue within their agency. The agency can exercise veto authority through official correspondence on the issue at hand.

Staff from the Carlsbad Fish and Wildlife Office traveled to Sacramento to meet with the Solicitor to discuss the project and the HCP on **February 28, 2002**. Some issues of concern were identified that will need to be resolved with IID. This includes the following. We need to be able to document that on-farm and systems conservation can be implemented to address both the water transfer and the mitigation water given that the current document does not specify that fallowing be used for mitigation water. We need to have documentation that the mitigation package meets the maximum extent practicable criterion. This includes an explanation for the lack of a speed

limit in the desert habitat. We also need documentation to support that the water agencies have adequate funds to implement the HCP, including the construction and long-term management costs. The permit will not include take for plant species. The basis for the take being provided has to be well documented. We should look at best management practices for construction projects as minimization measures. It is inappropriate to cover only the vegetation removal aspects of herbicide use. We need to consider the potential toxicological consequences of those applications in our approval, therefore it would be better to drop this from the covered activities. The lack of preservation in perpetuity should be reconsidered. We need to have a time limit on the development of the management plans and a mechanism if the IT cannot reach consensus on how created/acquired habitats are managed. If coverage is going to extend to farmers' irrigation and water conservation activities, they have to be under IID's direct control. We need a mechanism for this. Coverage for lease of lands for activities (such as agriculture) that are not covered activities cannot be included in the permit. Specific indemnification for the actions of lessees should not be required. These topics will need to be scheduled for a future meeting.

The group met again on **March 1, 2002.** The meeting began with updates on IID's information workshops on the project and the briefing for the new Director of the Fish and Wildlife Service. Fallowing was the primary topic for this meeting. We began by comparing the model results for the Proposed Project, Alternative 4 (all fallowing) and Alternative 1 (baseline). Given the time differential, the mitigation requirements for fallowing would be 5,333 acres for the fallowing approach versus 6,333 acres for on-farm and systems conservation (using the maximum confidence interval). If the medians are compared rather than the maximum confidence interval differential, the ponds would need to be 2,000 acres for the fallowing vs. 3,667 acres for the Proposed Project. IID felt that this acreage differential was adequate to make fallowing a more appealing approach whereas that based on confidence intervals was not. IID will evaluate the probabilities of results off the median to justify this approach rather than the confidence interval approach. IID would also like to evaluate the use of drain water in the ponds to determine if they can offset any potential selenium problems by increasing the flow. They will look at this comparison for both the Proposed Project acreage and the acreage required for Alternative 4. Temperature may also be an issue that needs to be addressed. Fallowing is also expected to reduce the managed marsh mitigation and pupfish requirements through reduction in selenium concentrations and reduce the tamarisk scrub mitigation by eliminating the impacts associated with construction of lateral interceptors.

We need to determine if there are any mitigation shortfalls with Alternative 4 and Approach 2 (mitigation water). If mitigation water is to be used, IID wants to know how long that requirement would remain. They do not see a need to extend it beyond the point when fish are gone. The water agencies will not support continuing fallowing to facilitate restoration unless the restoration project pays for it. IID is also interested in delivering the water to the Salton Sea at larger than the volume of annual reduction but for a shorter period of time (to the extent that it can be done without flooding shoreline facilities). The issue associated with this approach is that the volume is based solely on the model and cannot respond to the continued presence of fish in

the Sea. IID will complete the necessary model runs to identify the appropriate alternative delivery sequence.

CH2MHill provided an update of the desert monitoring text and a new flow chart.

We spent the final part of the meeting discussing CDFG's efforts to quantify take. They have identified 44 species that they feel warrant take in their permit. We walked through a couple of examples of their analysis with the group. CH2MHill is going to develop a similar analysis with nine examples of the remaining species to determine if take can be identified. One of these was from the group of 25 questionable species as IID is still interested in maintaining these as covered species.

We covered several topics at our meeting on **March 7 and 8, 2002.** This included the issue of preservation of created or acquired habitat in perpetuity versus for the term of the permit. IID agreed that preservation and management in perpetuity would be appropriate for those strategies that are replacing habitat that is lost permanently. This applies to Tree Habitat 1 and 2 and Desert Habitat 5. For the managed marsh, the desert pupfish strategies, and the Salton Sea strategies, IID will commit to evaluating the status of those in year 70. If they are interested in having their permit extended, implementation of those strategies including management of created habitat will continue. A limited set of options to consider will be stated in the document. The purpose of addressing this issue is to assure that there are not impacts associated with the discontinuation of management of created habitats.

We briefly discussed recreational activities and the need to specify the scope of the projects that are being considered. If the location can be specified, this would also be helpful. CH2MHill will attempt to make the language more specific.

We discussed the problems that remain with the coverage of herbicide applications. Although the HCP does not call for coverage of take associated with the toxicity of herbicides, it does call for coverage of the use of herbicides. This necessitates the same analysis in terms of direct effects that we do not have the resources to develop at this time. Coverage for toxic effects are deemed covered by the Environmental Protection Agency through the registration process that they are now consulting with the Service on. It was decided that the activities section would discuss the fact that herbicides are used as part of maintenance, but that coverage would not be included for this activity given the problems associated with it. The Service was tasked with developing language to incorporate into the HCP.

We discussed the HCP IT process and structure was the next item on the agenda. CH2MHill had developed a flow chart to represent the decision making process. We modified the process to indicate whether a specific decision was within or beyond the scope of the HCP or applicable management plan. If within the scope, consensus among the HCP IT will allow for the action to be implemented without any further approvals. If either consensus cannot be reach among the HCP IT or the action is outside the scope of the applicable plan, IID will need to seek consensus

among the decision-making authorities within the three participating entities (IID, CDFG, and the Service).

We also discussed burrowing owl monitoring. We were cautioned by the Service's monitoring expert that the 20% annual monitoring may not give an adequate population perspective. Adequate "calibration" of the approach will be needed as part of the demographic study. We were also reminded that any manipulations (e.g., relocations and artificial nest boxes) should be approached through hypothesis testing.

We discussed the fishery and mitigation with CDFG expressing concern that aspects other than the fish-eating birds were not being addressed adequately. They see two reasons to include more than tilapia in the hatchery efforts: tilapia are impacted by colder temperatures in the winter and may not be available in adequate numbers to support the birds, and there are recreational impacts that need to be addressed. IID is open to rearing other species, but cost is an issue. IID recognizes that there are many details yet to be refined in the mitigation approach. This includes the release size of the fish going to the Sea versus fish released to the ponds, the timing of the phases, the location of the ponds, and the source of water.

The Service then provided a summary of issues raised in our meeting with the Solicitor. This includes the need for documentation that the HCP achieves the "maximum extent practicable" standard for minimization and mitigation, the document should more fully explain why mitigation does not change with the volume of water conserved and transferred, the need for documentation that adequate funding will be available to implement the proposed HCP, and the need for effectiveness monitoring to demonstrate the assumed benefits to covered species. We also discussed the approach to take that was recommended by the Solicitor that included defining an acreage area for the effect, the nature of the effect, and whether that effect was expected to result in any mortalities or just harm/harassment. This seemed to be acceptable to IID. No take is provided for plants, but they are evaluated under the internal consultation. The potential conflict between the "otherwise lawful" language under the ESA versus potential take of fully protected species was raised, but IID's attorney responded that the Service has granted take for fully protected species in other permits. Fully protected species remain a big issue for State permitting. The management plans should have a time frame for completion, and the use of conservation easements needs additional details to be provided. There were additional issues relating to third party coverage, decision-making in the HCP IT, coverage of IID as a lessor, and potential impacts to the National Wildlife Refuge.

We reviewed many small issues which came up in the Service's review of the HCP and resolved most of those, then we continued the discussion with a review of the Desert Monitoring re-write. The main gap in this write-up was a discussion of habitat restoration under effectiveness monitoring. CH2MHill agreed to develop language for this section.

The Desert Pupfish - 2 wording is still problematic from the Service's perspective relative to a recent jeopardy opinion regarding the selenium criterion. IID is not open to a stated threshold

above which they need to take corrective actions, and they were hesitant to put a specific time frame on implementation of actions under this strategy. The Service will confer internally on the implications for our jeopardy analysis and possible solutions to address the issue. We also discussed desert pupfish monitoring (excluding selenium pending the Service's discussions) and identified the obligations for compliance monitoring under each of the other pupfish strategies. We reviewed the flow chart developed for Desert Pupfish - 4 and concluded it was workable. The remaining strategies are best addressed in terms of effectiveness through general population status information. We discussed problems associated with gathering these data, and determined that the approach of having the HCP IT study the issue was best. However, the current methods will be used to survey for pupfish in the interim. We have yet to determine the schedule for these surveys.

The group met again on **March 14 and 15, 2002.** We began the meeting by discussing the analysis done of the model results linking the hydrology between the proposed project and the baseline. The differences between the outputs were nearly normally distributed, and the 95% confidence interval resulted in the same 19 year difference that we had seen in the salinity curves. Under the all fallowing alternative, however, the 95% confidence interval on the difference was 14 years. This is probably related to the reduced number of outcomes incorporated into the modeling under the fallowing alternative. When we examined the distribution of the differences, they showed a skewed distribution toward the smaller differences. This may make it appropriate to consider a 90% confidence interval in this case, reducing the difference between this alternative for the project and baseline to 12 years. This would reduce the mitigation requirement if fallowing were the sole means of conservation used.

We discussed Plan Implementation, specifically the new text provided for Sections 5.1 and 5.2. Third parties are incorporated into the planned coverage, but these parties are not signatories to the Implementing Agreement (IA). The IA will need to include a mechanism (possibly the contracts between IID and the farmers) that addresses their coverage under the permit. A more general issue is the lack of avoidance/minimization measures to be incorporated into the third party actions. We need to provide text in the document to indicate why we don't need such measures and/or why such measures cannot be implemented.

CH2MHill provided a presentation that modeled different scenarios of water use in the mitigation ponds. The water volumes being discussed by the Principals is not adequate to prevent selenium accumulation in the ponds. This is undesirable for the mitigation, and CH2MHill evaluated what increases in water flows would be necessary to minimize this impact. It was determined based on their analysis that the selenium concentration could be kept below 5 µg/L by doubling the originally proposed flow using canal water or by using New River water at six times the originally proposed flow. The risk for birds could then be deduced based on the stilt water to egg model. Given that IID is not expected to be willing to fallow additional land to increase the flow to the ponds, the use of New River water may be the only option (Alamo River water has too high a selenium concentration to be used). The graphs presented were based on the baseline concentrations, so this would have to be updated incorporating the project results. Several other

concerns were raised that would need to be addressed prior to a permitting decision being made. This included: the need to consider what water reclamation in Mexico might mean to the available volume and river selenium concentrations, the need to consider other problems that may be associated with New River (particularly disease), the need to consider the effects on fish growth and survival in the ponds given the New River water quality, and the need to consider increases in bioaccumulation associated with a sediment versus a water column pathway of exposure. There may also be outside opposition to the use of New River water for the mitigation that we should be prepared to consider.

We discussed the pupfish adaptive management program including two new flow charts provided by CH2MHill. Aspects that were added included the opportunity for outside information to be incorporated into the program, the obligation to take action relative to selenium once in all of the pupfish drains, the ability to take additional actions provided the contingency fund can support them, and firmer time frames for the studies required as part of the overall pupfish strategy. It was decided to add the study of pupfish survey methods as a measure to address the effectiveness survey needs under strategies 1 and 3. Selenium monitoring will be required in the drains at least until we reach equilibrium in these concentrations. The IT will develop a specific monitoring plan. The Service is discussing internally how previous consultations fit into this process and whether specific action will be required at the concentration identified as a jeopardy for desert pupfish previously.

We continued the meeting the next day with a discussion of agriculture, and we revisited the concept of avoidance and minimization measures. The HCP also covers removal of water conservation measures, and that aspect has not been addressed in the discussion or the species impact analyses. CH2MHill committed to developing language to fill this void. Given the nature of the ponds and the maintenance anticipated for them, there should be very limited potential for take of the proposed covered species. We also discussed the lack of a monitoring discussion for agriculture. One aspect that was not considered feasible was to monitor the effectiveness of bird strike avoidance measures. Because bird strikes are not necessarily a regular or measurable event now (although we know they occur), it is unlikely that meaningful data could ever be acquired to measure the effectiveness of measures designed to increase the visibility of new power lines. Compliance monitoring could come in the form of the regular valley-wide crop reports that IID develops and general statistics for the water conservation measures implemented. Reports will be provided as to the number and mileage of any power lines added and diversion measures installed.

The remainder of the meeting was spent participating in a conference call with the Principals, the Director of CDFG, the Manager of the Service's California-Nevada Operations Office, and the Regional Director of the Bureau of Reclamation. The topics discussed included the progress on the fully protected species legislation. There are two bills being considered: is one general bill and one bill that specifically addresses the water transfer. There is apparently still resistance to passage of both of these bills. MWD has a major issue in regards to their water intake and razorback suckers in the Colorado River. They are looking for coverage that would be specific to their intake. The Principals are also looking for assurances from the State as are provided under

the Service's No Surprises Policy. This is not provided in the CESA, and the CDFG is concerned that this might set a precedent that is undesirable. CDFG will meet internally to discuss this issue. The Principals re-iterated their desire that they be allowed to pursue funding for the mitigation from sources outside their agencies. We discussed the status of the two Federal bills, and it was suggested that no action would be taken on these before funding action was taken by the State. We briefly discussed the mitigation ponds, and the staff asked that they be given another month to pursue additional details on the feasibility of this approach. The discussion then turned to fallowing and associated mitigation requirements. MWD discussed their concept of transitional fallowing. The resource agencies would want the timing of the transition to be based on the presence of fish in the Salton Sea rather than model predictions. There are still major socioeconomic issues to overcome, and there is very little general support for fallowing. Concerns about other potential lawsuits were raised for the fallowing scenario. The Service was asked if it can permit the project with the mitigation, but many issues remain to be resolved before that question can be answered. The implications for restoration cannot be ignored. The Service is obligated to permit the approach the avoids and minimizes to the maximum extent practicable. The final issues discussed were the covered species list and potential problems associated with differences between State and Federal permitting and processing the permits in the time frame available. Conducting parallel consultations on the two approaches for 96 species will make it very difficult to complete the required documentation within their time frame. Narrowing the project and the species list will improve the quality of the analysis and make it less vulnerable to a lawsuit. After scheduling the next two meetings, that call ended.

The group met again on **March 21 and 22, 2002.** We began the meeting with a brief discussion of the materials the CDFG had received from the Texas Parks and Wildlife Department on raising corvina in a hatchery situation. The information seemed to indicate that this was feasible, and adequate information was provided to develop a preliminary cost estimate. This process will require that Salton Sea water be used in combination with other flows to get the appropriate salinity for spawning. The fish will also need to be acclimated to a higher salinity prior to being released. We also discussed some of the information CH2MHill had gathered about selenium in the New River. They are looking at additional runs of the model to evaluate the impact of water reclamation in Mexico. Their preliminary information suggests that the loss of organic material could increase the amount of selenium that stays in solution. This is a concern for use on the fish ponds. However, the sewage flows have higher selenium concentrations than the agricultural flows because the municipal water is all from the Colorado River whereas irrigation water us from a mix of river water and well water. They will continue their efforts to model these changes.

We also discussed the 25 species (in the HCP as "Other Covered Species"). CDFG is developing an approach in which the activities covered relative to these species would be more narrowly defined to reduce the potential impacts associated with these species. The permit would provide for coverage of the take of these species when additional information was available to evaluate the impacts of the take. Coverage for survey purposes would be defined when survey protocols are approved. CDFG will not cover invertebrates, and the Service does not provide take for plants as it is not required. However, plants do need to be analyzed in the internal section 7 consultation,

and there are plant species for which the appropriate information for analysis is lacking. The HCP would also need to identify mitigation for each of these species, although in some cases the proposed mitigation may be adequate. The Service is still evaluating whether this kind of conditional take is possible under the ESA.

We discussed the status of the desert pupfish evaluation, and the Service is still considering how to address the existing jeopardy determination for the California Toxics Rule. IID is only willing to address the changes associated with the project not problems associated with the baseline levels as they feel those are the result of agricultural activities that are not covered. The Service requested model data for the potential pupfish drains so that a drain by drain analysis could be developed for this species. CH2MHill provided new text for the pupfish section of Chapter 4 and a new table for Section 3.7.

We briefly discussed herbicide use. IID is still concerned that they have a gap in coverage for take associated with the degradation of vegetation associated with herbicide applications. Although the ability to demonstrate that any specific take is associated with degraded vegetation is limited, they are not comfortable with this gap. They will have their attorney contact the Regional Solicitor on the issue.

We briefly discussed the approaches for the Salton Sea. We discussed the limitations associated with the discussion of the ponds in the EIR/EIS and determined that much more detail will be needed in the final document. All of the concerns raised relative to the Pacific Institute's Salton Sea proposal will need to be addressed. Also, we will need to incorporate the habitat feature commitments into the design as well as other management concerns (e.g., sediment basins that are paired for continual operation through maintenance cycles). We also discussed the mitigation water concept. CH2MHill is looking at re-running the model to develop a volume of water associated with this mitigation option. The problem is the lack of confidence in the 60 part per thousand salinity threshold for the fish. If an upper bound could be placed on this figure that all parties are comfortable with, the volume of water and delivery schedule could be developed. CH2MHill biologists will attempt to increase the salinity tolerance information that they have to address this issue.

On **March 21, 2002**, Service staff participated in a conference call with the Bureau of Indian Affairs (BIA). Other participants included the Service's regional tribal liaison, the Bureau of Reclamation, and the Environmental Protection Agency (EPA). The purpose of the call was for the Service staff to develop a strategy for the tribal consultation process. The BIA raised several questions including the reason for the delay in initiating the consultation. This was delayed due to limited staff time and efforts to more fully develop the HCP with IID. The BIA and EPA raised several issues that they felt were of concern to the Torres-Martinez Tribe in particular. This includes exposure to winds of contaminated sediments, exposure of cultural resources, concerns that their drinking water could be impacted by the proposed CVWD percolation ponds, there is disagreement between the inflow figures given in the IID document and those provided in the restoration document released in 2000. All acknowledged that the time frame would limit what

can be done in terms of addressing the Tribe's concerns, but all agencies will make an effort to see that their concerns are raised and addressed to the extent possible.

Staff from the Service, Bureau, CH2MHill, and IID met with the Tribal Council of the Torres-Martinez Tribe on **March 25, 2002**. The purpose of the meeting was to provide information on the proposed water transfer and to offer assistance in their evaluation of the document. We also scheduled a future meeting at which the government to government consultation could take place. The Tribe had several concerns about the project. They questioned the delay in beginning the consultation process. The Tribe also had difficulty getting a copy of the draft EIR/EIS and HCP. They are concerned that failure of the HCP will place additional burden on them to conserve the listed species. The Tribe is also concerned about CVWD's plans for using the water and how they might be impacted. They see the two issues of conservation and use of conserved water as linked, and they expressed the opinion that the separation as currently presented was arbitrary. Given that we do not know when CVWD will release their document, it is very difficult for the Tribe to make a determination as to whether the separation between conservation and use is acceptable to them. A great deal of tribal land will be exposed based if the conventional conservation/mitigation approach is implemented. This has not been addressed adequately in the document. They are also concerned about the drains that will flow across their land and the construction that will be required to extend and connect these drains. The use of the water by CVWD is also of concern because the proposed percolation ponds are up gradient of their drinking water well, and the Colorado River is known to be contaminated with perchlorate. All of these issues will need to be addressed to their satisfaction. The Tribe looks to the Service and the Bureau to represent them in this process given the role of the Department of the Interior as their trustee and the actions required of the two agencies.

Staff from the Carlsbad Fish and Wildlife Office joined staff from the Regional Office in a meeting with the Department of the Interior Solicitor and IID's attorneys on the Implementing Agreement on **March 27, 2002**. Counsel for the CDFG was also present. We spent the meeting reviewing the Solicitor's edits to the draft agreement developed by IID's attorneys. Several issues came up during the course of that review. The Solicitor wanted language removed that would tie the Service to the QSA. The Service is not a party to those agreements. The issue of assurances was referenced in several areas of the document. These references are limited to what is provided for in the No Surprises Policy (50 CFR 17.22). CDFG has not yet made a determination as to what assurances they will be offering through their permit. There must be a mechanism that binds third party beneficiaries in some way. The contracts between IID and the farmers signing up for water conservation do offer a mechanism provided the appropriate language can be incorporated into them. IID's attorney will develop some draft language for the Solicitor's review. The lack of minimization measures for the farmers and mitigation for loss of farm land could make the permit/HCP vulnerable. The conflict of saying there is take related to agriculture but the mitigation is maintaining agriculture in the Imperial Valley is problematic. Additional consideration will have to be given to this approach. Leasing will not be a covered activity as there is no need for coverage. Leasing in and of itself does not result in take. There are issues related to extending the coverage to unlisted species under the Migratory Bird Treaty Act

(MBTA). The Solicitor concurred that there is an inconsistency here and volunteered to elevate the issue to a higher authority.

As part of this process IID will have to provide documentation that the HCP can be funded adequately. General cost figures are acceptable, but the Service does have to be able to document that the necessary funding will be available. This also applies to the funding that will cover adaptive management. IID will have to demonstrate why it is biologically adequate. The agreement needs to be worded in such a way that adaptive management has been planned for and does not constitute a minor modification. Monetary damages are not allowed, and all parties should agree to cover their own legal fees. The regulations used should be those in effect at the time of the action/issue. One exception is that the No Surprises Policy will be considered to remain in effect unless a court order strikes it down. IID intends to raise the issues of monetary damages and regulations in effect to a higher authority. Non-severability will apply to the agreement except by mutual consent. Severability of the permits will have to take into consideration the requirement that the activities covered by the permit be for otherwise lawful activities. Take authorization will not be given for plants.

We briefly discussed the topic of herbicide use as a covered activity. IID still sees coverage of herbicide application as necessary, but they will consider the draft language provided by the Service.

The group met again on **March 29, 2002.** We had guests from Kent Sea Tech, an aquaculture operation in the Coachella Valley, and IID also invited their aquaculturist for a discussion of the phased mitigation approach. The Kent Sea Tech staff recommended that we reconsider exclusive use of tilapia in the ponds given their temperature sensitivity. A large proportion of the fish would be expected to die off in shallow ponds during the winter months. They recommended that we consider a combination of tilapia and carp to cover the entire range of temperatures. We could reduce contaminant problems by locating the hatchery facility in the Coachella Valley and using groundwater. If the facility is going to be located in the Imperial Valley with the New River the water source, some treatment will be required to control solids and pathogens. The water requirement for the hatchery is on the order of 3,000 acre-feet/year. We could minimize selenium problems in the ponds by maintaining a high flow rate and using clean food. Based on our preliminary discussion, the capital costs for the hatchery facility are probably on the order of $ 8-10 million with similar annual maintenance costs. The acreage for the ponds could be reduced by minimal management; they felt that the foraging ponds could support 2,000 pounds/acre without burdensome management. The ultimate density is driven more by what is appropriate for the birds. They recommend that additional species be incorporated into the ponds for a greater variety in size for foraging birds. Fish could be eradicated periodically if selenium bioaccumulation or disease become problems. The monitoring requirements associated with these facilities is not insignificant. They will develop preliminary estimates based on use of existing facilities and groundwater versus new facilities and river water.

For stocking tilapia directly to the Salton Sea, the Kent Sea Tech staff felt that only temperature acclimation would be required. They felt that the tilapia could tolerate the salinity change. Corvina stocking offers a whole different set of concerns as this has never been done commercially. They are willing to develop preliminary estimates for stocking corvina, but the range of costs may be fairly wide. The target is for 150,000 five pound fish per year. They will estimate the number of stocked fish required to meet this goal. They asked the resource agencies to develop target delivery schedules for the tilapia (and carp for the pond phase) to best meet the needs of the target fish-eating birds species. This includes the size and pounds required on a monthly basis. **This information will be provided by April 2, 2002.**

A conference call was held that included the Principals from the four water agencies, the Director of CDFG, the Regional Director from the Bureau of Reclamation, staff from those agencies and staff from the Carlsbad Fish and Wildlife Office. The water agencies were anxious to have feedback from CDFG on the language they have proposed for legislation on the fully protected species issue. CDFG has received the language but has not had the opportunity to deliberate on it. They hope to meet and discuss it next Monday. The water agencies are looking for support from CDFG and DWR in getting legislation through. Fallowing and mitigation is an issue of great interest. The technical staff hope to address this during the Thursday/Friday meeting. The Coachella Canal Record of Decision has been signed. MWD and CVWD are anxious to get a concurrence letter from CDFG. The discussion included the upcoming meetings among the water agencies and opportunities to educate entities outside California on progress to date. The SWRCB petition process is also a key part in this process. They are hoping that legislation can come in time to be considered in the hearings. The water agencies were concerned about the CDFG comment letter on the QSA Programmatic EIR, and they have asked that CDFG coordinate their comments with them on the draft EIR/EIS for this project. As the final topic an agenda was developed for the meeting/call on April 9th.

Three **public hearings** were held to receive testimony on the EIR/EIS on **April 2, 3 and 4, 2002.** The hearings were held in La Quinta, El Centro, and San Diego. A verbatim transcript of the comments can be found in the administrative record.

The group met again on **April 4 and 5, 2002.** We began with a brief discussion of the CDFG comment letter on the QSA Programmatic EIR. CH2MHill provided some preliminary cost figures form Kent Sea Tech on the fish production. Hatchery start up would cost on the order of $4-5 million. Annual production would be approximate $2/lb. of fish or $6.4 million/year. CH2MHill suggested that the agencies consider stocking the fish to the river deltas rather than constructed ponds. Barry Costa-Pierce suggested that there may be as much as 500 acres around the river mouths that is of lower salinity that could support fish longer. The Service has several concerns about this approach: there would be no way to manage for avian botulism in this situation, there is no way to assure fish availability in such an uncontrolled situation (the fish could go up river or into deeper water), we don't have accurate measurements of the size of this "estuarine" area, we don't know how it will change with salinity, and we don't know how stable it is under windy conditions. The Service asked that the constructed ponds be considered a primary

approach with consideration of this if the appropriate supporting information can be provided at some future date.

We moved into a more detailed discussion of the ponds. IID believes that 500 acres is feasible given the space that will be available around the New River as the Salton Sea recedes. The ponds would be flow-through systems with a gravity-fed supply, but they would have to be pumped when complete drying is needed. They were planning for each pond to be approximately 40 acres using cut and fill construction. A justification for 500 acres (as opposed to the 5,000 acres in the draft document) will need to be developed for the final version of the document. We need to confer with the Kent Sea Tech staff to confirm that it would be reasonable to stock 630,000 2-5" fish in 500 acres of ponds within a month's time. This is the proportion that was assigned to February based on the bird distribution. One issue that came up in terms of timing of construction was that it is likely that we would need to replace the island nesting habitat before we would need to stock fish in the ponds. IID was open to construction and filling of the ponds with islands to occur early to meet that need with fish stocking to occur later. We need to determine how much nesting space is required and how much island space to assign to each of the ponds. CH2MHill will re-write the appropriate sections of Chapter 3 and 4 to reflect the fact that IID is now committing to 3.2 million pounds of fish annually to be stocked to 500 acres of ponds. The delivery schedule will be finalized by the HCP IT.

For Approach 2 (mitigation water) IID is looking for an upper limit on this requirement rather than taking the approach that water would be added until the fish are gone. We need to determine an appropriate threshold. In order to provide adequate justification for the threshold, it will require looking at some of the literature on salinity tolerance in tilapia. The agencies requested that CH2MHill provide copies of four references that they had identified that looked at salinity tolerance in the range of interest (60 - 80 g/L). A threshold of 60 g/L did not appear to be appropriate given that one of the citations indicated that reproduction was seen at 69 g/L. Aquaculture production values seemed of limited usefulness given that they would all likely be at much lower salinities.

We briefly discussed the re-write on the desert pupfish monitoring section. The Service is still evaluating the selenium strategy, and additional monitoring requirements may stem from any changes in that strategy. We also discussed the other covered species. CH2MHill is developing the take table per the guidance received from CDFG, but the Service is still lacking adequate information to address these species to meet the permit issuance criteria. This can be re-evaluated when CH2MHill provides the table requested by CDFG. The write-up for changed and unforeseen circumstances should be available next week. CH2MHill is incorporating information on IID procedures for responding to emergencies such as hazardous materials spills. We discussed the phased mitigation approach under a fallowing for conservation and transfer scenario. If the same approach is used, the 14 year difference requires 2.3 million pounds of fish per year. If we consider that the probability distribution for the fallowing alternative was skewed towards the low end of the distribution, a 90% confidence interval looks acceptable. This would reduce the requirement to 2 million pounds of fish per year (a 12 year difference). We discussed

the corvina hatchery. Although this is not a specific requirement in the HCP, CDFG is still looking for cost figures to address this approach to mitigation for recreational impacts. The hatchery operation for this species will need to be ready earlier than that for the tilapia.

We also discussed Salton Sea monitoring by working through the text in the HCP. IID needs to be prepared to cover the costs of fish monitoring if CDFG cannot follow through on this commitment. A related concept that will need to be addressed in the IA is the level of commitment from the resource agencies and what it will mean to the implementation of the HCP if one or both of the agencies is/are not able to perform some or all of the required tasks. This needs to be reflected in the Roles and Responsibilities language the agencies are providing for Section 5.1.2. We determined that bird surveys of the ponds should be conducted in summer in addition to spring, fall and winter (IID was not present to concur). Adaptive management measures are no longer focused on in-pond production but should include: changing the species of fish being used (one with similar culturing requirements, however), changing stocking procedures, and adjusting the size of the fish. Disease will be addressed under changed circumstances. In terms of coordinating with a restoration project, the language was modified to reflect that stocking would continue until restoration re-establishes natural fish production in the Sea. IID was not present to concur, but this would not be an increase over what is required if there is not restoration as stocking will continue to the Sea or the ponds for the permit term.

Approach 2 offers different challenges to monitoring. We concluded that flow measurements would be the most direct measure of compliance. These measurements would be compared to the projections for baseline inflows. A component of effectiveness is tracking the salinity changes that result from the supplemented inflows, and fish presence would also be appropriate to monitor. However, given that the salinity projections and estimates of fish salinity threshold are estimates, there are no requirements of IID in terms of adaptive management should the actual salinity and fish occupation changes not match our expectations. Provided compliance with this avoidance measure can be documented, no addition monitoring is expected to be required. The agencies will confirm this assumption.

Our final topic was shoreline strand monitoring. The Service recommended that the HCP IT be given flexibility not only in terms of the frequency, but they be allowed to extend the monitoring if they deemed it appropriate. IID was not present and so could not concur with this change. We also modified the language to allow for more advanced technologies that could replace the use of aerial photography. All agreed that such advances were likely in the next 75 years.

The HCP group met again on **April 10 and 11, 2002.** We began with a discussion that include the State and Federal Refuge managers on the topic of managing the IID managed marsh mitigation. The Sonny Bono Salton Sea National Wildlife Refuge has concerns about both their water priority and the fact that they are on month-to-month leases. While IID instructed them that this situation was negotiable, the management of the mitigation is considered a separate issue. IID would guarantee water for the marsh and provide funding for management. All of the infrastructure would be constructed by IID. Both agencies were open to the concept, but many

details would need to be resolved prior to such a contract being developed. The location of the proposed mitigation would factor into which agency would be the logical choice for management.

The discussion then moved on to Approach 1 for the Salton Sea. We have three proposals that have been discussed: 1) 5,000 acres of ponds with in-pond fish production/hatchery supplementation using canal water and built on agricultural land, 2) 5,000 acres of ponds with in-pond fish production supplemented by hatchery fish using New River water and built on exposed seabed/New River basin land, and 3) 500 acres of ponds to be stocked with hatchery produced fish using New River water and built on exposed seabed/New River basin land. The concerns that have been raised regarding the last proposal include: increased transmission of avian disease, interference among birds during foraging, control of water quality such that toxic materials are preventing from entering ponds, responding to fish kills (clean up and re-stocking), bioaccumulation of selenium and DDE, and increased exposure of fish to pathogens that could enhance the risk of avian botulism. Future documents should address these issues. The costs have only been developed for proposal 1, but the $110 million estimate did not include an adjustment for inflation, the discount rate may be too high given the current economic climate, and inadequate water was included in the proposal. We estimated that at least double the proposed water volume would be needed. Preliminary estimates of costs on proposal 3 are approximately $75 million, but this has also not been adjusted for inflation. Water is essentially free in this proposal.

The discussion then moved on to Approach 2 for the Salton Sea and how this would be implemented. The primary concern is the length of time mitigation water would have to be added. The general concept that was developed is that water would be delivered to the Salton Sea until fish-eating bird numbers had declined to a yet to be determined level or the year 2030, whichever was first. The year 2030 represents the 95% confidence interval on the baseline reaching 60 g/L salinity (this is the same cutoff used in developing the mitigation in Approach 1). The most direct approach to this as mitigation would be to add annually what did not go to the Salton Sea the prior year as a result of water conservation. The volume would be adjusted for the lower salinity of Colorado River water versus the drain water that is lost. IID would like the resource agencies to consider a schedule that provides for earlier delivery of water to the Salton Sea (i.e, not annually based on the prior year's conservation), but the volume of water delivered would be equivalent to what is needed to keep the salinity of the Sea below 60 g/L until 2030. Service staff responded that the slope of the salinity curve is important along with the endpoint. Fish are likely to be more stressed and less healthy the closer they get to the maximum level of their salinity tolerance so that period of maximum salinity should be no longer than it would be with the baseline projection. IID intends to run the Salton Sea model to determine the optimal delivery schedule that still meets the requirements. **The costs associated with this approach will be based on the volume of water required at the water transfer price of $250/acre-foot of water.** One issue related to the permit is that this requirement differs depending on whether water goes to CVWD or not. A mechanism will have to be developed that addresses the salinity changes associated with variable use of the water by CVWD.

The Bureau of Reclamation was represented at the meeting and suggested that we reconsider our baseline. It was their staff's contention that if the voluntary efforts fail, IID's reasonable and beneficial use will be reconsidered and their water deliveries reduced. Impacts to the Salton Sea without the project are therefore underestimated. IID countered that the baseline in the document is the Bureau's baseline as well given they are the Federal lead on the project. IID also expressed the opinion that the Bureau cannot reduce IID's deliveries (as an enforcement action) without regard to the requirements of the ESA. CDFG also expressed concerns about such criticisms at this late date.

For the remainder of the meeting we discussed some outstanding issues. The Service was asked if there had been any change on their position relative to the other covered species. Staff relayed that no significant discussions had occurred on that topic. IID was urged to consider that the legal liability associated with coverage in the permit given the state of knowledge may be a greater risk than that associated with not having those species covered in the permit at this time. The Service is still waiting to see language as to why a lower speed limit is not practicable in the desert. The issue of coverage of conversion of lands leased to the Refuge to some other activity came up. Service staff expressed the concern that the current documents do not address the biological impacts of this action nor is it mitigated in the HCP. IID decided that this would be excluded from coverage and would be addressed separately if necessary. We discussed the fact that there is take of desert species that is minimized but not mitigated. CDFG suggested that this could be addressed by surveys to determine the number of individuals likely to be impacted with preservation of adequate acreage to offset this loss. This sounds reasonable in concept, but it may offer challenges in the Federal process. The Service is still evaluating the language in Desert Pupfish Strategy - 2 and hopes to have a determination soon. We discussed the possibility that the cap in water use or the Inadvertent Overrun Policy could result in cuts of water deliveries to the refuges. This is addressed in the document by assuming that the payback would occur through fallowing of agricultural lands. No impacts are expected to the refuges provided they do not exceed their standard water orders. If they take more than their order, they would be required to reduce use the following year to make up for that over-usage.

Species that are impacted by agriculture need to have mitigation of those impacts to the maximum extent practicable (or fully mitigated per CESA). This occurs in some cases through benefits accrued from other mitigation strategies but not in all cases. Some are only discussed in agriculture (mountain plover, ferruginous hawk, and long-billed curlew), and others have mitigation in the Tamarisk scrub strategy only if it is placed near agriculture (Swainson's hawk, white-tailed kite, and loggerhead shrike). This may be undesirable given the cowbird population in the area. The group agreed to consider what mitigation might be feasible for these species. New language for changed and unforeseen circumstances should be available next week. We have a CEQA issue with the fact that the CVWD Water Management Program EIR is not going to be available for review during this project's comment period, and this project's EIR/EIS refers to it. We briefly discussed mitigation for Alternative 4, and concluded it would essentially be the same as for the proposed project scaled to a lower fish requirement (2 million pounds annually

once adjusted for the lower impacted and the skewed distribution of model outputs). We concluded the meeting with a discussion of the process and schedule.

Staff from the Service, the Bureau, and CH2MHill met with the Torres-Martinez Tribe on **April 12, 2002**. The staff from the Bureau of Indian Affairs, the Environmental Protection Agency, and CVWD were also present. We began with a discussion of the various documents involved in the water transfer and QSA. The Tribe was concerned about the way parts of the project were segmented into different documents and the fact that CVWD's document would not be available during the comment period on the water transfer EIR/EIS. This is problematic, and the lead agencies will need to find a way to address this gap as the process proceeds. The Tribe will have to consider what they have before them in making their comments. If additional information is received in the final EIR/EIS, they would like the opportunity to provide comments and have them entered into the project record. We proceeded to discuss their comments on the QSA Programmatic EIR and the Bureau's Programmatic EIS on the Implementing Agreement/Inadvertent Overrun Policy. Many of these comments focused on CVWD and their use of the additional water. This discussion centered around issues of water quality in the Colorado River versus the groundwater. Perchlorate is of great concern because it is present in the Colorado River at levels of concern but not in the groundwater. This issue only recently came to CVWD's attention because the action level recently dropped, and it is now below the current river concentrations. CVWD has this concern in the upper basin as well because recharge is also occurring there. CVWD will be making every effort to encourage use of Colorado River water for irrigation thus reducing the recharge that will be necessary. They asked the Tribe to consider the other impacts that may be associated with not re-charging (e.g., increased pumping costs and intrusion of high salinity perched aquifer water). However, the proposed location of the recharge basin focuses exposure on the Tribe. The Tribe also raised issues in the letters about listed species and/or critical habitat at the Salton Sea that were not adequately addressed. There currently is no designated critical habitat at the Salton Sea itself. The Tribe is concerned that with this project any future critical habitat may have to be designated on their land. The Tribe also looks upon the fish in the Sea as a trust asset that is not adequately addressed by Approach 1. The Tribe sees recovery of the Sea as the only viable approach to addressing the ecosystem problems. CH2MHill provided an update on the area in the document they hoped to strengthen, and the technical session of the meeting ended.

In the **government-to-government consultation** the group had an open discussion of the project direction. The Tribe sees a dual responsibility for the Department in providing for the water transfer and restoring the Salton Sea. They are limited to groundwater as a sole source of their water, and they do not want to see the use proposed by CVWD impact this resource. The Bureau will continue to work with CVWD to identify a way to address the Tribe's concerns. The Service provided some background as to how Approach 1 was developed, but the advantages of Approach 2 are obvious from many standpoints. We will need all parties to accept the use of this water for the Sea as a reasonable and beneficial use if we are to be able to proceed with this approach. This includes the Department of the Interior. The Service and the Bureau will work

with the Solicitor's Office to identify a mechanism whereby comments to new information in the final EIR/EIS can become part of the public record. With that, the consultation closed.

Staff from the Service and the Regional Solicitor's Office met with legal counsel for IID on the Implementing Agreement on **April 16, 2002.** CDFG legal counsel participated by phone. The group went through the latest re-write of the document. The necessity of Certificates of Inclusion for the participating farmers was reiterated. IID's counsel will develop a sample contract that will be the functional equivalent of a Certificate of Inclusion for the Solicitor's review. The Service has not seen any language regarding the disposition of created habitats at the end of the permit. The closure of these habitats will have impacts that have not been addressed, and IID was to develop a list of options for those habitats to be incorporated into the HCP. The Solicitor stressed that this will be needed. The Implementing Agreement will also need to identify the mechanism of land preservation, and it must be acceptable to the Service. If the HCP is going to cover monitoring activities, the qualifications required for individuals carrying out those activities needs to be delineated in the HCP. Permit coverage for IID as lessor for land used for other than covered activities will not be provided. Documentation that the mitigation minimizes and mitigates the impact of the take to the maximum extent practicable is needed for all conservation strategies outlined in the HCP. The topic of assurances was discussed and resulted in debates on several fronts. These issues were deferred in order to continue progress on other areas of the document. Documentation of funding is still pending; it is supposed to be part of the application package. There also needs to be documentation that IID has the authority to carry out the actions described in the HCP. The attorneys will exchange another round of re-writes and schedule another meeting as appropriate.

On **April 17, 2002**, the HCP team took a tour of the upper reaches of the All-American Canal. This allowed the group to evaluate the effectiveness of the proposed desert measures. The team determined that vehicle speeds are likely to remain low due to the road condition in several areas. Much of the canal road in the upper reaches is set on a terrace of sorts between the surrounding habitat and the canal itself and does not appear to be particularly attractive for wildlife use. One covered species was observed during the tour (brown-crested flycatcher, *Myiarchus tyrannulus*).

The HCP team met again on **April 18 and 19, 2002.** In this meeting we attempted to wrap up as many of our outstanding items as possible. We have decided on a volume of water for mitigation by choosing the upper bounds of 60 ppt salinity being reached in the year 2030. This water can be delivered on a variety of schedules, but the volume obligation is set. All agreed that the water could stop sooner if the fish were gone before 2030. IID will also evaluate the additional volumes required if half or all of the water is used for soil leaching. IID responded to the concerns about water rights as a potential changed circumstance by stating they have command and control of the water, and it would not be subject to others' water rights claims. Relative to eminent domain, IID would re-establish the required habitat elsewhere if required as a result of eminent domain. We established time frames for this as part of our discussion. There is still resistance among the Service and CDFG to the 500 acre pond concept. Additional information was sought from the Bear River Migratory Bird Refuge on the density of white pelicans on their ponds. They have not

had any significant disease events among pelicans, but other birds have suffered from avian botulism, Newcastle disease and avian cholera. The staff there has observed pelicans and cormorants foraging in the same areas. We had an in depth discussion of the pros and cons of different pond concepts including a review of potential costs. No conclusion was reached regarding this issue.

Herbicide use will be dropped as a covered activity. Regarding pupfish drains and selenium, IID will maintain the current conservation strategy knowing that refinements may be needed prior to permitting. The desert strategy may be modified to delay flood related repairs to give spadefoot toads time to metamorphose into adults (if not precluded by health, safety and property damage concerns). Land use has been clarified in the HCP by adding a table of the specific covered land uses. In regards to the other 25 species, IID will incorporate these into the document per the direction from CDFG. The Service will have to address them as they deem appropriate. On fallowed lands, IID will have farmers implement some erosion control measures. IID is willing to commit that on their lands this will be a cover crop or ridge-tilling to try and enhance foraging opportunities for covered species. This will not address mountain plovers, but the need for mitigation may be so small as to not be practically mitigated at all. Nesting islands will be created to address gull-billed terns and black skimmers specifically. IID will consider addressing double crested cormorants by breaching the road to Mullet Island in hopes of maintaining its inaccessibility to terrestrial predators longer. The IT will evaluate whether additional measures will be required. In regards to Salton Sea monitoring, no effectiveness monitoring will be required with Approach 2. Only compliance with the required delivery of mitigation water will be needed. Approach 1 will be similar to what is in the text now and what has been developed under other strategies. Things that could be adaptively managed under the HCP include the species of fish used, the delivery methods and schedule, and possibly the acreage of ponds provided it does not exceed the maximum.

The HCP team met again on **May 6 and 7, 2002.** The resource agencies informed IID that the 500 acre pond proposal was not adequate. We are back to something on the scale of the original 5,000 acre proposal. We discussed dropping the stocking of tilapia into the Salton Sea with the ponds to become operation earlier instead. This was the preferred approach for CDFG. The pond development could be phased to allow for adaptive management of pond construction and operation. We are looking at the need for aeration, supplemental feeding, use of canal water, and hatchery supplementation as in-pond production is not likely to be adequate. In regards to Approach 2, IID insisted on a clause that would allow them to cease mitigation water deliveries if the fish were no longer present in the Salton Sea. They did not want to be obligated to make mitigation water deliveries after the fish are gone. The HCP needs to identify a method for monitoring this aspect. In our discussions of Approach 1, we focused on bird density in the ponds. Based on figures received from Bear River Refuge and the average numbers of birds, 5,000 acres would be an appropriate size. This does not account for amortization of size as we have done with the fish requirements. Concerns were raised that fish density would be too low to be attractive to the pelicans. We have no independent data on fish density that is attractive to

pelicans. There is a great lack of confidence that this proposal can mitigate successfully the impacts to fish-eating birds at the Salton Sea.

In our **conference call with the Principals on May 7, 2002,** we relayed the great uncertainty associated with the ponds. Given the unknowns, it is difficult to say if this approach will meet the permit issuance criteria. The added costs of canal water, aeration and the other requirements have not been considered adequately. The total for this approach is now over $300 million. Given that there is still a rather large mitigation requirement with fallowing for the project (direct fallowing), it makes more sense to narrow the field of projects/mitigation to efficiency conservation with the hatchery/ponds and direct fallowing with mitigation fallowing. Use of Colorado River water for mitigation water should be acceptable provided it is part of the 4.4 million acre-foot apportionment for California. MWD raised concerns that other states might object to this during the period when the Interim Surplus Guidelines are in effect. Further direction is needed on this issue. CDFG agreed to work with the Service on making a decision as to whether Approach 1 could be permitted. The Service reminded the water agencies that in our determination we will consider if Approach 1 would minimize and mitigate the impacts to the maximum extent practicable and whether documented funding sources are available for this part of the HCP. Both agencies were comfortable with permitting Approach 2. Another meeting was scheduled, and the call ended.

On **May 8 and 9, 2002,** Service staff participated in a meeting to organize the response to comments effort. Master responses had been prepared for several subject areas, and some specific comments have been developed. Copies of these were provided to the Service. Given the uncertainty associated with the HCP approaches for the Salton Sea, no major revisions will be done pending the outcome of the Service/CDFG discussions. Responses will not be developed on Approach 1 until further guidance has been received. The approach will be updated based on the most recent discussions, but nothing will be finalized. Beneficial use of the water is still an issue under both approaches given they both call for use of canal water. This will need to be addressed. Approach 2 in its most recent form is problematic because the draft EIR/EIS considers the mitigation water for the term of the project as mitigation for other significant impacts (particularly air quality impacts). This issue will be re-evaluated by IID. If mitigation water is provided throughout the project, it will be done on an acre-foot to acre-foot basis. Salinity may reach the 60 ppt threshold in 2023 as predicted by the model rather than forcing it out to 2030 as in the current approach. The Service stated that this was done because IID wanted to stop providing mitigation water. A 1:1 match for 75 years is acceptable as an avoidance measure. Deferral of issues to the Implementation Team is being considered and legal precedent is being sought to respond to comments on this issue. Selenium in the drains was discussed, and the conclusion is that there is no feasible mitigation for these increases. Pupfish drains will be addressed per the HCP. Under Approach 2, mitigation water could be used to dilute the selenium concentrations in the pupfish drains. The baseline was a source of many comments and much discussion in the group. The group achieved a reasonable understanding of the assumptions, but the responses given need to be very thorough and clearly stated so that others can understand these concepts.

Other topic areas discussed include: growth-inducing impacts (master response pending), cumulative impacts (most comments focused on Mexicali), general project description issues, and Indian Trust Assets (which is being re-written). The Service's margin notes were also discussed as they were mentioned in the Service's comment letter. CH2MHill committed to reviewing the letter responses to assure that significant issues were addressed and responding to minor issues/questions in the errata. There was disagreement as to how CVWD's receipt of water would affect the volume of mitigation required under Approach 2. Additional model runs will be conducted and the outcome provided to the Service for discussions with that agency. The problems with air quality dominated the discussion on the second day suggesting that mitigation water for the term of the project might be the preferred approach. A decision is pending. Dust generated from construction and fallowed land can be addressed more easily through best management practices and are not considered a problem to address in the responses. The discussion briefly touched on the Salton Sea restoration, and IID is of the opinion that there are no impacts to that project given no project has been approved. The document does state that the scale will be different with and without the transfer. Following another brief discussion on socioeconomic issues, the meeting adjourned.

A conference call was held between the Service, the Bureau of Reclamation, the Bureau of Indian Affairs, and the Torres-Martinez tribe on **May 20, 2002.** The Bureau of Reclamation provided an update on the document schedule and how that can provide for additional time for government-to-government consultation if needed. Comments received on the Final EIS can be responded to in the Record of Decision (ROD) and will become part of the administrative record. The draft Programmatic EIR for the CVWD Water Management Plan is expected to be released in June. We discussed the decision-making process for the Salton Sea approach; CDFG is expected to provide specific input on this issue at a meeting on May 21st. The Torres-Martinez still have concerns about groundwater and air quality. They have not received adequate documentation of the groundwater model from CVWD to date. The Bureau of Reclamation will encourage CVWD to forward more information on to the tribe. Perchlorate is of concern and will be problematic because it has not been modeled. The Service agreed to forward information on the Salton Sea approach as it develops and to schedule other calls as needed.

The HCP team met on **May 20 and 21, 2002,** to discuss the screen-check version of the HCP and attempt to finalize the draft on all issues except the Salton Sea. We discussed the need for better documentation for the conservation strategies having met the "maximum extent practicable" aspect of the issuance criteria. IID objected given that this standard (by their interpretation) should only come into play if the adequacy of the conservation strategies is questionable. It is IID's opinion that they have proposed conservation measures that are more than adequate to offset impacts, and thus there is no need to demonstrate that the measures represent the "maximum extent practicable." The Service raised that possibility that additional avoidance/minimization measures may be required for maintenance of the existing All American Canal as an emergency conveyance; additional input from other desert staff is being sought. Per recent discussions on the Implementing Agreement, there will be no take coverage for IID as a lessor of lands used for activities other than covered activities. The Service will also not be

covering the application of herbicides. The Purpose and Need section of the HCP also needs to specify that a permit is needed to avoid a violation of section 9 of the Endangered Species Act. This language will be added. The measure to extend the useful life of Mullet Island (breeching the road bed while still flooded on either side) needs to be added to the Salton Sea strategy if Approach 1 is taken. Approach 1 should also clarify the aspect of addressing fewer birds for a longer span of time. With Approach 2, the avoidance does raise an issue in regards to permit coverage. IID is hopeful that both agencies can provide for permit coverage for avoidance just as they would if there would be quantifiable take. It should be feasible to provide coverage through acknowledgment of their avoidance of the impacts.

Some minor modifications were made to the species-habitat associations and some of the conservation strategies. The group reviewed the new measures for the "Other Covered Species" and recommended several clarifications, particularly relative to the bats. The Service has not yet made a determination as to coverage for these species. Several specific issues were identified that require input from the Service's Regional Office. The figures used for the commitments of water require thorough justification given the restrictions set forth in the No Surprises Policy. We discussed the possible scenarios under Approach 2 (mitigation water to maintain the Sea below 60 ppt through 2030 or mitigation water to match reductions throughout the permit term). One requirement drops with the use of Approach 2 either way (nesting islands), whereas the pupfish connectivity and shoreline strand/adjacent wetlands strategies would still be required under the 60/2030 scenario. Mitigation for the term of the permit would address all of these requirements, and this would also address other impacts including air quality. IID will need to make a determination as to which scenario best meets their needs.

On **May 21, 2002,** there was another Principals' Meeting at the CDFG Director's office. During that meeting CDFG informed the water agencies that the pond concepts developed to date would not meet their permit requirements biologically. We discussed the need for coverage of species for which impacts are avoided if the fallowing/mitigation water approach is utilized. This is very important to IID. There are still issues to be addressed relative to fully protected species and the Colorado River. IID is working with several environmental groups on these issues. These same groups would also like to see mitigation water for the life of the project. That would meet the mitigation requirements for the HCP. Additional discussions are expected with these groups.

A meeting of the EIR/EIS team occurred on **May 22, 2002.** At that point, IID had made the determination that only Approach 2 would be pursued for the Salton Sea. The focus of the discussion was which scenario would be implemented given that the current document calls for mitigation water for the life of the permit. IID would prefer a scenario that allowed them to stop the mitigation water if it is not required to address air quality impacts (after the HCP requirements have been met). The Service suggested that the 60/2030 scenario could be implemented, and the additional water to achieve that (over just matching the reductions) could be banked for the future. If mitigation water is required, the banked portion could be deducted from future requirements. This is very difficult to implement if IID does not want to commit to using only fallowing for water conservation. Maintaining flexibility in the conservation method would be

facilitated by a scenario that would only match reductions. This would require that mitigation water be provided for a longer period of time (to 2042 to match the model predictions for the No Project to reach 70 g/l salinity), and IID is evaluating the benefits/costs of maintaining the additional flexibility. IID is also concerned about elevation of the Salton Sea. To maintain the structural integrity of the dikes along the south end of the Sea, they would like the elevation to go down to at least -235'. This is what is predicted for the Baseline/No Project, but the 60/2030 scenario might slow the elevation reductions down. This will also need to be considered, and IID is developing language that would preclude any requirements in the HCP that could result in flooding of private properties. If this limits the ability to achieve the 60/2030 goal, a discussion will be needed that the proposal is the maximum extent practicable and why.

Several NEPA issues came up including the use of an abbreviated Final EIS approach. Given the magnitude of comments and the potential for changes, it is not the preferred approach. However, no other approach is deemed feasible given the schedule. Hearing comments and written comments are all being responded to, but individual comments will be referred to Master Responses as appropriate. Approach 1 will not be removed from the document, but the Errata will clarify that this approach is no longer being considered. The Service recommended a more comprehensive Master Response on the Baseline issue given the number of comments associated with this topic. An actual calculation of the baseline inflow figures would be helpful. Responses to all comments should be available for review in the first week of June.

The meeting continued on **May 23, 2002,** but Service staff were not available to attend.

On **May 29, 2002,** staff from CH2MHill contacted the Service to discuss the shoreline strand/adjacent wetlands portion of the Salton Sea strategy. Given the use of Approach 2, the concern was raised that we may need to reconsider the Baseline for this habitat type. If the impacts are avoided until 2030, it may be more appropriate to establish the Baseline at that time. However, given the need for an established commitment from IID, this approach is problematic. CH2MHill wanted to develop language that would not obligate IID to mitigate for impacts resulting from the actions of others. They committed to developing such language that would result in the monitoring beginning in 2030, but the cap will remain the acreage base on the information in the University of Redlands database as the best available information at this time. They also intend to include language that will call for re-evaluation of the appropriateness of the strategy at that point in time. This language has not been received from CH2MHill/IID.

Preliminary responses to the issues raised at the previous HCP meeting were forwarded by Service staff to IID and CH2MHill on **June 3, 2002.** Service staff recommended that IID consider these responses (although perhaps not yet complete) in continuing their refinement of the HCP. IID requested that the Service provide very specific guidance as to what is needed to finalize their HCP/permit application package as they do not have the resources to continue the negotiation process.

Service staff provided some assistance in finalizing the responses to comments, but time constraints limited our ability to participate in the process. Service staff provided comments informally on the Master Responses on **June 3, 2002.** Access to specific comments was available through the CH2MHill website, however, only a portion of the responses was accessible to the Service staff. Service staff provided informal comments on the Biological Resources topic responses that could be accessed on **June 6, 2002.** Informal comments were provided on the Hydrological Resources topic responses that were accessible on **June 7, 2002.** On **June 12, 2002,** the Service's Carlsbad and Regional Offices received copies of the completed responses to comments (on CD-ROM) for review. This included Master Responses and responses to the individual letters and testimony received. The Service was given until 4:00 pm on **June 14, 2002,** to provide the Bureau of Reclamation with comments on the responses. Due to the limited time for review, only a portion of the Master Responses and one letter were reviewed. Informal comments on these topics were provided to the Bureau by the deadline.

On **June 11, 2002,** a meeting took place between the Service, the CDFG and the Arizona Game and Fish Department to discuss issues related to impacts on the lower Colorado River from the proposed water transfer and related activities. Carlsbad Fish and Wildlife staff participated by phone to provide background information and to stay informed as to issues related to the transfer. The primary concern raised was that the biological conservation measures, while appropriate to offset impacts to federally listed species, are not adequate to mitigate all of the impacts on the lower Colorado River from the project. Arizona Fish and Wildlife Service staff acknowledged that the Fish and Wildlife Coordination Act (FWCA) process was not complete for the project and that it would be appropriate to address remaining Federal and State concerns as part of that process. Arizona Service staff planned to contact the Bureau of Reclamation in order to continue the FWCA process so that outstanding non-ESA issues could be addressed.

Staff from the Bureau of Reclamation and CH2MHill developed new versions of the Environmental Justice and Indian Trust Assets sections. Unfortunately, these were not provided to the Service for review until **June 14, 2002.** Comments were provided to the Bureau on these sections on **June 17, 2002** (the next business day). However, the responses to comments and the Errata sheets (including this new text) had already been mailed to the agencies that submitted comments. The lead agencies were concerned that it would be inappropriate to make changes to the text of these sections between distributing the responses to the agencies and IID's certification of the document as a Final EIR. This determination as to whether additional changes will be incorporated into the document will be made by IID counsel.

The Service and CDFG conferred via teleconference on **June 21, 2002,** to discuss the problems associated with the "pond approach" to mitigating IID's impacts on Salton Sea fish-eating birds. Several issues were identified including potential disease problems, concerns regarding consistent water availability, potential behavioral problems and associated legal liability associated with encouraging bird foraging in a pond setting, and the lack of an appropriate contingency plan should the ponds fail to mitigate the impacts. Uncertainties were also identified associated with the stocking of fish directly to the Salton Sea as it is not clear that fish could be stocked

successfully for the entire interim impact period identified by the model. There have not been adequate studies to identify the salinity thresholds for reproduction versus survival and growth to evaluate this for the tilapia currently inhabiting the Salton Sea. With this approach the full impact would be mitigated over the interim impact period, rather than spreading the mitigation over the entire term of the permit. This would result in a very large fish stocking obligation on an annual basis.

On **June 27, 2002**, the Service, CDFG and the water agencies met to discuss narrowing the scope of the HCP. Carlsbad staff were only able to participate in part of the meeting via telephone. The focus of the discussion was the possibility of dropping the white pelican from the covered species list. This would facilitate the process now, but it could be problematic if the species is listed in the future. Concerns were raised over the likelihood of incorporating fallowing into the project and the limitations on the use of Colorado River water for environmental purposes. The discussion included the limitations that potentially could be imposed by the Endangered Species Act as a result of a potential future listing.

The Service and CDFG had a follow up call on **June 28, 2002**, to discuss the implications of a shorter covered species list. We identified the problems associated with attempting to feed one fish-eating bird species and not others and the potential limitations of a Salton Sea stocking program. The length of the permit and the length of the obligation were also discussed. The length of the obligation can be based on the modeling or the results of field sampling, but the start and end dates should not be based on a combination of the two. There are nest site issues associated with some of the species on the covered species list that the agencies would like to see addressed.

Later on **June 28, 2002**, the Service met with the Bureau of Reclamation to discuss options for ESA compliance. All acknowledged that the HCP was the best approach, but this approach may not meet the deadline. A section 7 approach would focus on the listed species only, but other specific details are yet to be defined. The Bureau is developing a Biological Assessment (BA), and they also are planning supplemental documentation under NEPA. They are hoping to maintain both options (IID completes their HCP with mitigation for covered species versus section 7 consultation on the federally listed species) well into the process to allow IID every opportunity to move forward and complete their HCP, but the Bureau would like to have a contingency plan should that not be possible by the end of the year.

We followed up that call with a brief call to staff of the CDFG. We discussed the fish stocking approach as an alternative mitigation that could be considered to allow for on-farm and systems water conservation. The best approach to this mitigation is to base the timing on field sampling. We can focus the stocking season on the brown pelicans, but we have to consider the white pelicans where there is overlap in presence to assure that adequate forage will remain available for the brown pelicans. Double-crested cormorants may not need coverage given their status in California, but there are still concerns about gull-billed terns and black skimmers.

Service and CDFG staff met briefly via teleconference on **July 9, 2002**, to discuss the options relating to California brown pelicans. Mitigation in Mexico is problematic for CDFG because it does not maintain the species in California. Mitigation on the California coast is problematic because it may not address the management unit (population) impacted by the changes at the Salton Sea. The possibility of short term fallowing for water conservation along with a fish stocking program is still being considered as mitigation, but there is no way to guarantee that the duration of this activity will match the impacts as predicted by the model.

The Service, CDFG and the water agencies met via teleconference on **July 11, 2002**. The focus of the discussion was the brown pelican as the listed fish-eating bird of greatest concern at the Salton Sea. We discussed the numbers of brown pelicans using the Salton Sea versus coastal and Gulf of California numbers. We could not confirm CVWD's contention that the Salton Sea birds were only 1% of the population. We discussed the role of the Salton Sea for this species; its importance is based on the numbers of birds (3-4,000 annually) that come there. The concept of feeding the birds in Mexico was raised. This is problematic for CDFG to permit as there is no demonstrable benefit to brown pelicans in California; in fact we would anticipate a net decrease of this species in California under this scenario. This would also be problematic in that we would need to rely on another government to enforce the requirements of the permit. Any feeding scenario requires that enough fish be provided so that the brown pelicans receive the required quantity of fish while accounting for the foraging by other species that we know will occur. It may be difficult to take actions to enhance fish production or reduce fish utilization in the Gulf of California such that adequate forage could be guaranteed. This could require adjustments in the regulation of fisheries management in Mexico. It would also be difficult to document that the necessary benefits had been accrued.

The group also discussed the possibility of a short term fallowing program as part of the water transfer. The hypothetical scenario limited the water transfer to the first term of 45 years, and it included the exclusive use of fallowing for the water transfer for the first 5 years. Starting in the 6th year, conservation would occur through improvements in irrigation efficiency. Without seeing a prediction of the salinity and elevation changes under this scenario, it was difficult to determine what mitigation would be needed. IID was not offering mitigation water under this scenario, but the interim fallowing would reduce the speed of the salinity changes by some unknown increment. This would provide some additional time to plan a restoration project. The discussion was brief as a result of the lack of the necessary background information, but the agencies agreed to consider the possibilities in a future discussion.

Service staff participated in a conference call between the Assistant Secretary for Water and Science and the CDFG Director on **July 17, 2002**. The Assistant Secretary reported on the meeting that had just been concluded with the four California water agencies. The Assistant Secretary relayed to the Director that the water agencies were considering participation in the approach being developed by the Bureau. Given the short time frame remaining, it does not appear feasible to complete the HCP. Section 7 provides an option for ESA compliance, but the State needs to be included in that process. The Director expressed his deep concerns that the

differences between the section 7 and CESA requirements may limit the ability to completely address the CESA requirements through section 7 of ESA. The nexus for the section 7 is proposed to be a set of fish and wildlife conservation measures to be undertaken or facilitated by the Bureau for listed species as called for under section 7(a)(1) of the ESA. The desert pupfish, Yuma clapper rail, southwestern willow flycatcher and the brown pelican are to be addressed. Mitigation is a difficult issue for the brown pelicans as extra-territorial actions are likely precluded by time and may be precluded under CESA given the circumstances. Fish stocking to the Salton Sea has not been received well on any front. The 5-year fallowing proposal by IID is still being considered, but the benefits to the salinity of the Sea are quite limited. Coastal mitigation is of concern because that breeding group of birds is considered a separate breeding population from the birds that use the Salton Sea. Making changes to address forage availability is also difficult as it is outside the Service's jurisdiction. Section 7 offers an advantage in that it does not require legislation.

A follow up call occurred on **July 18, 2002**, that included the water agencies. The water agencies expressed a willingness to participate in the section 7 process; a formal recognition of that will be forthcoming in the form of a letter. All acknowledged the need for the Federal process to parallel the State process, especially given the difference in standards between the two. The project description will be a key aspect to bringing the State and Federal processes together. Voluntary conservation measures will serve as the core of the Bureau action, with the water conservation being addressed as cumulative effects. Given the difficulty in identifying mitigation for the brown pelican, additional work will be required to bring the two processes together.

Another call followed on **July 18, 2002**, between the Service and CDFG to discuss more information on the status of the California brown pelican. We discussed existing threats and potential beneficial actions, but off-site enhancements opportunities in California are limited. We briefly discussed the status of the de-listing action and upcoming research efforts on the species.

The Service conferred with the Solicitor's Office in Washington and the Bureau of Reclamation on their proposed section 7 approach via teleconference on **July 19, 2002**. The Service received clarification that the focus of the effort is the voluntary wildlife conservation measures, but that the section 7 analysis would need to include the interrelated effects of the water conservation measures that are part of the entire operational change on the Colorado River. The Bureau is currently developing the BA including the project description, so the discussion focused on general process issues. The Service will need to work with the Bureau in the development of the project description, and ultimately the effort will need to extend to CDFG to assure that the process is compatible with the State's. The need for the Bureau to complete an agreement with the water agencies that also triggers the need for the proposed conservation measures will tie the actions together as interrelated. We briefly discussed some of the issues with brown pelicans; the Service and CDFG are still working towards solutions that work under both sets of requirements. Coverage of the water agencies under the Incidental Take Statement can be extended if they have applicant status; we are waiting on official word as to their willingness to participate in the process. We briefly discussed Fish and Wildlife Coordination Act issues, and the Bureau was

willing to review their project description with that potential need in mind. They did state that most of these issues would be addressed through the NEPA process. The Migratory Bird Treaty Act will be addressed per the Section 7 Handbook. The intention is to address water conservation-related impacts only; broader maintenance issues will need to be addressed directly by IID. It was suggested that this aspect could be addressed after the deadline.

The water agency Principals met with the Director of the CDFG, the Regional Director of the Bureau, and Service staff on **July 22, 2002.** The Bureau provided a description of the information included in their draft BA. This includes a focus on voluntary endangered species conservation measures as the core of the project. The water agencies would be brought into the process through conservation agreements (these would be binding agreements). As participants they could directly implement some of the measures or could provide funding to the Bureau for these actions. As a result of their participation, the water agencies would be covered under the incidental take statement for their actions as part of the overall water conservation and transfer program (extending beyond just the fish and wildlife conservation measures). The measures included are based largely on measures taken from the draft HCP for the Yuma clapper rail, desert pupfish and southwestern willow flycatcher. The Bureau has made a no effect determination for the bald eagle, razorback sucker, and the mountain plover. Additional measures were proposed for the California brown pelican. This included a suite of actions that could be combined into a conservation program. The program would begin with surveys to better understand the use of the Salton Sea and its importance to this population of California brown pelicans. The conservation program would include a pelican conservation fund that could be used to increase breeding success by protecting breeding sites or by boosting forage availability, although the specific methods to be used have not been identified. The group discussed the possibility of implementing some of these actions in Mexico and possible avenues of carrying such actions out (e.g., the Trilateral Commission that includes the U.S., Canada, and Mexico has coordinated actions in Mexico that were funded by the U.S.). This process would provide the needed ESA coverage for impacts to listed species resulting from the project, but it would not provide any assurances to the Bureau or the participants. CDFG raised concerns over the need to quantify the take of brown pelicans so they can determine if the proposed program constitutes full mitigation. They also raised concerns that the use of this approach may jeopardize the current support of the environmental groups for Senate Bill (SB) 482 dealing with fully protected species under state law. Additional concerns were raised regarding the CEQA requirements for the project and the certified EIR for the project. It would not reflect accurately the mitigation being contemplated for the project, and supplemental documentation may be required. It may be possible to address this need through the Final EIS that has not been released. The SWRCB record also does not reflect this change.

We also discussed the potential role of interim fallowing to provide additional time for implementation of the restoration program. That would not be required for the project as described in the Bureau's draft BA, but could be incorporated into the project if that helps to meet state requirements. IID is only open to fallowing on such an interim basis. They are looking for some kind of assurances that the fallowing can stop after 5 years and they can proceed with

efficiency conservation. They are concerned about the current version of SB 482 requires fallowing through the year 2030. The Bureau was very concerned about IID requiring legislation to provide the desired assurances for efficiency conservation. The water agencies were clear in that this interim fallowing would not be implemented in order to revisit the permit process at the end of 5 years, only to provide the restoration program more time. Permitting needs to be for the duration of the transfer as required by the Interim Surplus Guidelines and the QSA.

The remainder of the meeting focused on the topic of coverage for state-listed species through the section 7 process. It will be necessary to analyze the impacts on state-listed species and provide for full mitigation of those impacts if CDFG is to issue a consistency determination based on the Service's biological opinion. A 2081 permit is also an option, but this requires more time and possibly more mitigation. Concerns were raised about other Salton Sea species that may be impacted, even to the point of future listing, but the water agencies responded that some of these other species have provided insurmountable hurdles and we need to move forward. The Bureau reminded the group that these other species will be included in the NEPA process. We discussed the need for further refinement of the measures pulled from the HCP as part of this expansion of the section 7. IID expressed the desire to still pursue the HCP as they are wanting the associated assurances. We discussed possible ways to divide the coverage between the two process: geographically (Salton Sea versus Imperial Valley) or functionally (project-related versus maintenance-related). The Service and the Bureau will confer with the Departmental Solicitors on the issue, and CDFG will confer with their counsel. The group identified one species (the California black rail) that should be addressed if a project-related consultation is going to move forward. Four other species will be considered. Staff from the Bureau, the Service and CDFG will evaluate the species and the project description to determine what will need to be added to expand coverage for the state-listed species. Fully protected species are still an issue, and the process cannot move forward if SB 482 fails. We discussed the possibility of legislation that would provide the environmental groups with a State and Federal "statement of intent" in regards to restoration of the Salton Sea, but that may not be possible this year. We identified specific tasks that were needed to resolve the various issues raised, and the meeting was adjourned.

Carlsbad Service staff participated in a conference call on **July 23, 2002**, to discuss the approach to finalizing the EIS. Staff from the Bureau, CH2MHill, and IID participated in the call. The document will be stripped of references to Approach 1 for the Salton Sea and Approach 2 will be revised to reflect that it is now maintaining 60 ppt until 2030. IID raised the concern that the document cannot reflect different conclusions from the previously certified EIR or they will have to re-circulate and re-certify the document. For the Service to adopt the Final EIS, we must be satisfied with the responses to all of the Service comments provided on the draft. If we are, the Service files a Notice of Availability and issues a Record of Decision in parallel to the process carried out by the Bureau. Given the time frame for review of the comments in finalizing the EIR, the Service was not afforded the opportunity for a comprehensive review of the responses to our comments. It will be necessary as part of the finalization of the EIS to conduct such a review so that adequacy can be assured and supplemental documents can be avoided.

Staff from the Service met with the CDFG, the Bureau, and the Principals from the water agencies on **August 2, 2002**. The focus of this meeting was ESA compliance. The Director of the CDFG pointed out that we aren't just dealing with ESA and CESA compliance. In order for the State to permit the project, SB 482 (the Kuehl bill) must pass. This will not occur of the environmental groups all oppose the approach we are taking. MWD raised the possibility of combining a group of different approaches that cumulatively would get us close to the concept of no impacts for 19 years. This included the substitution of water transferred from the Palo Verde Irrigation District (PVID) to MWD for the first 5 years of the transfer then ramping down to zero by the end of the tenth year. So called evapo-transpiration (ET) fallowing would be used to manage lands and keep inflows to the Salton Sea at the baseline (this also avoids beneficial use questions). We agreed that the term "material impact" in SB 482 needed to be defined as this would determine more specifically how close the project needed to match baseline. IID would like to see the elevation of the Sea go down to reduce their liability associated with potential flooding of lands behind the levies at the south end of the Sea. The Bureau and the water agencies stated that there needs to be a way to permit this without a re-opener. This is difficult under section 7 of the ESA and only applies to the listed species. We were discussing standards for the mitigation when it was realized that the 19 year figure may have been used incorrectly. The resource agencies met separately to resolve this issue and determined that a 15 year period of no impacts to the Sea (i.e., keeping the Sea at baseline for the first 15 years of the project) would be appropriate minimization that the environmental groups might accept. Offsite mitigation would then be developed for the remaining impacts to the California brown pelican so that the fully mitigated standard could be achieved, and CDFG could do a consistency determination. This determination would be made again if the consultation process was ever re-initiated. The water agencies were still looking for a way to get assurances given the commitments in with the QSA.

We discussed the potential implications of this approach. CDFG felt that the requirements of SB 482 could still be met through this process. IID wanted to assure that the socio-economic impacts be addressed in the Imperial Valley if this approach was going to be implemented. The water agencies will need to provide a package that meets the baseline for the first 15 years and provide supporting model runs on it that identify the impacts to the Salton Sea of this approach. CDFG and the Service will then work to quantify the impacts and identify a set of mitigation measures that would fully offset those impacts. The Director of the CDFG was hopeful that the environmental groups would be satisfied with this concept. The water agencies questioned why section 10 and a 2081 CESA permit were not possible. They are a possibility but time is the critical factor. Section 7 and a consistency determination are possible by the end of the year, whereas a permit under section 10 may not be possible in that time. All agreed that the time frame for coverage would be the 75 years provided the conservation package was appropriate.

The Service, the Bureau and the CDFG met briefly to discuss the BA that had been submitted to the Service by the Bureau. The inclusion of the impacts of water conservation as cumulative effects is problematic as this does not allow us to cover them under the Incidental Take Statement. This will be addressed by the Solicitors representing the Service and the Bureau. The

BA also needs to address state listed species that may be affected by the project. Of particular concern are the brown pelican, the Yuma clapper rail and the California black rail which are also fully-protected species.

The Service, CDFG, CH2MHill and the Bureau participated in a conference call on **August 5, 2002**, to discuss more specifics on the brown pelican. We all acknowledged that various constraints limit us to off-site, out-of-kind mitigation. The key is to determine the equivalence between the impacts at the Sea and the mitigation. There are many projects that have been identified by the American Trader restoration process that would benefit brown pelicans. Most of these are roost enhancements/replacements. We need to quantify the take that would occur at the Salton Sea. The current discussion focuses on first year birds. We need to look at the appropriateness of this assumption. At the conclusion of this process, we will need to have enough specificity to support making the necessary jeopardy/no jeopardy and fully mitigated determinations. The Bureau will put forth the conservation measures and will work with the water agencies to see that they are funded. There are no assurances as to cost with the section 7 process. The Bureau will have the obligation to see that the measures are implemented regardless of the funding agreements used. Although we don't anticipate take for all listed species (CDFG identified the brown pelican, desert pupfish, Yuma clapper rail and California black rails as the species of concern here), the BA should provide an explanation as to the specifics of why the other species are not addressed.

The Service, the CDFG, the Bureau and the water agency Principals met again **August 7, 2002**, to continue the discussion. Staff from the CDFG and the Service presented information on potential pelican projects that could be incorporated into the conservation measures. These focused on creating/enhancing roost sites on the California coast with special emphasis on Santa Barbara and San Diego Counties. The key is that we are addressing energetics which is the link between foraging and roosting. IID suggested that the CDFG has the jurisdiction to change fishing regulations to offset foraging impacts more directly. The next steps are to quantify the post-minimization impacts of the project and to specify enhancements that will offset the impacts of the take. The water agency proposal would constitute the minimization measures. The water agencies' greatest concern was cost.

We then moved on to the concept of matching baseline for the first 15 years. Several possible definitions were identified:

matching the mean model output for the baseline,
matching the confidence interval boundary on the baseline model output, or
matching the project-related reductions directly.

The Service suggested that the last was the most defensible. IID would like additional elevation reductions to be considered to address flooding risk. The water agencies wanted to know what would happen if the inflow reduction matching did not result in measured salinities within the model predictions. This could result in a re-initiation of the consultation. IID asked if it would be

an unforeseen circumstance under section 10. IID suggested that we still pursue a section 10 permit albeit with a shorter covered species list.

IID does not currently support the 15 year baseline concept. Their Board has approved a 5 year interim fallowing program. Some model outputs were provided for this approach. IID stated that they are not willing to agree to the QSA cap without the monetary compensation that was to come with the transfer of water to SDCWA as would occur with the PVID substitution. The Bureau suggested a potential funding approach to offset this so that the PVID substitution could be included as the 5 year fallowing program is unacceptable. IID presented model runs for a 10 year and 15 year hybrid plan, but both fell short of the baseline projection. MWD also presented model outputs for their proposed package, but they were also slightly short of the baseline and required more fallowing by IID. The water agencies are scheduled to meet on August 8 to discuss and resolve these issues. CDFG will need a response before the upcoming hearing on SB 482. CVWD suggested that a commitment of funding from the state to address socio-economic impacts would be helpful. The water agencies provided their individual concerns but committed to trying to reach consensus.

Staff from the Service and the CDFG attended a meeting between the water agencies and the Secretary of the Resources Agency for the State on **August 12, 2002.** Secretary Nichols and CDFG Director Hight provided the water agencies with a summary of the meeting they had held with the environmental groups on the proposed approach for the water transfer. The environmental groups were open to the concept, but they were also looking for some commitment on the part of the State and Federal governments in regards to Salton Sea restoration. The groups apparently accepted that the 15 year concept is based on the baseline that several of them had objected to in their comments on the EIR/EIS. It was not clear whether they understood that we would be matching the mean of the baseline rather than the confidence interval boundary. The Resources Agency is hopeful that they can become a partner in the restoration efforts with the Bureau, and they are looking to issue the upcoming Alternatives Report jointly. A joint policy statement or Memorandum of Understanding (MOU) are possible mechanisms that could be used to establish this relationship. Such mechanisms are much more likely to be completed by the end of the year than additional legislation on the topic. The topic of socio-economic impacts was also raised, and Secretary Nichols is waiting to receive input from Imperial County on the types of projects that they would like to see implemented to address these impacts. The State is not likely going to be able to provide funding, but it may be able to provide support in the form of waiving taxes/fees to facilitate the needed infrastructure.

The discussion then moved on to the pelican proposal. The Service and the CDFG are still pursuing additional information on the pelican roost concepts, and additional support in the form of engineering expertise will be needed. The SDCWA had made some contacts with the Navy on the Zuniga Point option that they will forward to the Service. The water agencies have identified seven potential scenarios to get to the 15 years at baseline. They were not prepared to share any specifics, but they hoped to have this narrowed down to a single package by **August 26, 2002.** This package will include a flexible combination of fallowing, PVID substitution, and

groundwater extraction to get to the goal of baseline for the first 15 years. They will be running the scenarios through the Salton Sea model to narrow the field. At the same time they are trying to come to consensus on the quantification of the economic impacts.

IID reminded the group that they are still interested in completing the HCP for the Imperial Valley. They do have concerns that have not been addressed (species coverage, assurances) in our current focus on the Salton Sea. IID would like to meet with the Service and CDFG to resolve the remaining issues. MWD also acknowledged that there are still issues that need to be resolved relative to the action on the Colorado River with CDFG.

Following the meeting with the water agencies, Service and CDFG staff met to discuss where we go from here. Additional CDFG staff resources were identified to assist in getting cost estimates for the pelican roost projects, but staff was instructed to focus on the biological justification for the approach. We were in agreement that our focus for these projects should be on creating new roost habitat, and projects that restrict recreational access will not be included. We need some level of assurance that the identified projects will be implemented. Assurances will not be possible given that we are dealing with section 7 on the federal side, and they will not be providing a conservation strategy for the Salton Sea in their HCP. Completing the "in-Valley" portion of the HCP will still be difficult in the time remaining. We will need to determine the appropriate time for public review when the Notice of Receipt of Application is published.

The Service, the Bureau and CDFG met on **August 22, 2002**, to discuss the BA. We began by going through the discussion on the Yuma clapper rail and identifying the changes that were needed. The use of the 21 acre figure was apparently in error, and it is the Bureau's intention to create a total of 73 acres of managed marsh. Of this acreage, 31 acres are for salinity-related impacts and 42 acres are for selenium-related impacts. We agreed to a 10 year time frame for completion of the marsh. The Bureau committed to water of the same selenium concentration as Colorado River water or water that was of a lower concentration than a future water quality criterion that had received a "No Jeopardy" determination from the Service. As the main components of this strategy were substantially similar to the HCP strategy, no other changes were made. We also discussed long-term management and agreed that management should be in perpetuity for that acreage associated with permanent changes in the irrigation system. For the remaining acreage, we agreed that this would need to be addressed prior to the end of the project. The biological opinion will not include take coverage for closure of the wetlands.

We had a more lengthy discussion on the southwestern willow flycatcher. This approach should consider the latest research on suitable breeding habitat. The Bureau has access to this information, and it will be incorporated into the measure. We discussed some of the complications that may be associated with the surveys required for this approach. One problem is that we are lacking key information in regards to the timing of changes associated with the 15 years at baseline concept. Without that we were not able to specific time lines for the monitoring. We agreed that the initial evaluations and baseline surveys need to occur before any water

conservation actions that could impact the potential habitat start. The specifics of the monitoring will be developed in the monitoring plan that will be subject to Service and CDFG approval. Another complication involves the fact that normally projects requiring surveys that employ tape-recorded calls address that take within the project biological opinion. The Bureau was not comfortable with this approach and will consider the additional requirement that all surveys will be conducted by personnel with 10(a)(1)(B) research permits from the Service. Another alternative is to address all suitable habitat and not conduct breeding bird surveys. The Bureau will consider this approach. The BA also needs to strengthen the argument that there are no impacts associated with loss of migration habitat. The Service and CDFG referred the Bureau to the "nearest patch" analysis done for the Coachella Canal lining project.

The California black rail will be added to the BA. The acreage of marsh mitigation is believed to be conservative enough to include them given the salinity acreage is based on the most sensitive vegetation and the selenium acreage was based on total vegetated acres. The mountain plover needs additional analysis to reflect its specific habitat preferences and the possibility that only hay crops may be fallowed. The Bureau is considering modifications to the determinations for the mountain plover and the razorback sucker to may affect, not likely to adversely affect, as they are more defensible. The razorback sucker has not been found in lateral canals based on the collective memories of those involved in the discussion, but they have been found in the major canals so impacts from canal lining may be possible.

Following this discussion, the group participated in a call with several pelican experts and representatives of the water agencies. The purpose of the call was to attempt to quantify the impacts to brown pelicans that will result from the early loss of fish at the Salton Sea resulting from the water transfer project and to quantify the benefits that may be associated with roost enhancement projects on the southern California coast. An economic analysis was used (as is done in natural resource damage assessments) to determine an equivalency between bird impacts at the Salton Sea and bird benefits on the coast given an assumed life of the enhancement project. Based on the discussion, it appears that the primary impacts are to birds that disperse widely after the breeding season. Juveniles tend to disperse more widely than adults, and it is possible the projects on the coast could be designed to specifically target this age group. They tend to prefer estuary areas over the open water off the coast. It should be possible to do wetland enhancements that will increase fish production as well. Service and CDFG staff will continue to gather information that will assist us in quantifying the impacts and the benefits needed to fully mitigate those. The mitigation standards will need to be developed from this information in case specific projects cannot be identified in time to complete the consultation. On **August 23, 2002,** Service, CDFG and Bureau staff visited the Buena Vista Lagoon to discuss enhancement possibilities that could provide for pelican roosting and/or foraging. Given existing water quality problems, a more comprehensive restoration is needed in order to accommodate brown pelican use at the lagoon. It is still being considered, but existing uses could not be impacted as a result.

A conference call was held to discuss the status of the Final EIS on **August 26, 2002.** Staff from the Service, Bureau, IID and CH2MHill participated. The Final EIS is on schedule and will be

delivered in a draft from to the Bureau and the Service on **September 16**. Currently, **5 days are scheduled for review** of this version of the document. Most of the call was focused on the Service's recent comments on the Final EIR. We discussed the strategy for this document, and the Bureau and IID acknowledged that supplemental documentation will likely be needed given the potential changes associated with ongoing negotiations. By finalizing this document now, the supplemental document can be tailored to address only the changes. We addressed the other Service comments and identified a strategy for each. These will be discussed internally by Service staff and management.

The Service, Bureau and CDFG re-convened on **August 29-30, 2002**, to continue the discussion on the BA. We discussed the need for additional clarification on the acreage of tamarisk scrub that is being addressed. The Service and CDFG indicated that the HCP was addressing all of the tamarisk that was impacted, and we were not clear on the document's inclusion of only a portion of the tamarisk in the "project area". We then went on to discuss the desert pupfish. The lack of a refugium pond appeared to be the largest gap relative to what had been agreed to in the HCP. The Bureau agreed to add this to the first measure for pupfish. We also discussed the need to consider a lower salinity threshold and the possibility that unseen physical barriers may exist and become a problem for pupfish movement as the elevation of the Sea goes down. The Bureau agreed to these changes as well. Language will be incorporated from the HCP to indicate more specifically what monitoring will be required, and a requirement for a monitoring plan that is approved by the Service and CDFG will be added. The Service suggested that the document needed additional clarification on how it was decided that species would be included or not included in the different levels of analysis. The Bureau agreed to re-evaluate the language that is currently in the document and add details as needed.

We moved on to the topic of brown pelicans. One of the key steps at this point is to decide how to quantify the impacts to brown pelicans. The Resource Economic Analysis (REA) approach conducted by CDFG is workable, but we need to refine the starting number and the "decay" rate. We talked about various approaches and settled on taking the mean of the available peak counts. We did not use a mean across the season because the use of a mean would not address the turnover of birds between surveys. The use of bird-use days was also considered, but this was thought to unnecessarily complicate any calculations. As long as the same units are used for the impact and the benefit, either unit should give similarly representative results. Based on input from the pelican experts, we do not have clear evidence that either the forage base or roosts sites are limiting. We do know that when roost sites with the appropriate characteristics are made available, the pelicans do use them. With this premise in mind, there are gaps in the availability of roosts along the California coast that we can consider in developing a list of potential projects. As long as the roosts are available year-round, migratory pelicans are expected to use them. We discussed that the impacts may not be equally distributed across all brown pelican colonies in the Gulf of California, but they may be focused on two or so colonies in the northern Gulf based on behavioral observations of feeding at the Salton Sea and in the Gulf. We discussed the need to ramp down the numbers according to some schedule of loss, rather than using the assumption that bird use would instantaneously drop. Using this approach we developed a schedule of pelican

loss by assuming that one third of the birds would be impacted by the change in salinity from 50 to 60 ppt salinity and the other two thirds by the 60-65 ppt change. A small residual number are expected to stay at the Salton Sea. This schedule will be plugged into the REA to determine the mitigation requirement. The number of birds to be addressed by the mitigation depends on the life of the mitigation project. This is still being considered.

We briefly discussed other more general comments. The Bureau agreed to evaluate or comments and incorporate changes as appropriate. It is not clear if a new BA will be provided at some point, or if the changes will be provided in the form of "errata" to update the original document.

A follow up call on the Final EIS occurred on **September 3, 2002.** The topic of the uncovered species and maintenance impacts was discussed, and CH2MHill committed to adding further clarification regarding the relationship of operations and maintenance to existing conditions to the response to the Service's comment. Service staff was asked if the Service concurred with the other resolutions proposed, but feedback has not been received from the California-Nevada Operations Office. The Final EIS is still on schedule for delivery in two parts: Volume 2 on **September 9** and Volume 1 on **September 16.** Comments are due to CH2MHill by Monday morning, **September 23, 2002.**

A brief call was held between the Service, the Bureau, and CDFG to update the status of efforts to move forward on the consultation on **September 5, 2002.** It was brought to the resource agencies attention that IID had contacted the Bureau raising concerns about the scope of the section 7 consultation. IID is still hopeful that the HCP can be completed for the Imperial Valley species and a section 10 permit can be issued by December 31, 2002. IID is elevating the issue with the Service. We have received brown pelican counts for Buena Vista Lagoon, but they also included the beach area and so are of limited value. We have received the results of the latest run of the REA for brown pelicans, and the scale of restoration is on the order of 552 pelicans for the 2030 time frame or 330 for the 2078 time frame. The Bureau will provide revisions to the BA in the form of errata sheets. This will be ready soon for the conservation measure updates we have discussed. During a brief follow up call between the Service and CDFG, we identified the need to develop a restoration package that addresses both roosting a foraging needs. To the extent possible, it would make the most sense to do these in the same location. Should it be necessary to do roost and fish enhancement projects separately, we need to maximize the overlap in benefits. We will use the scale from the REA as a starting point.

A brief conference call was held on **September 16, 2002,** to brief Washington Office staff on the status of the IID water transfer ESA compliance. Issues remain in regards to the what aspects of the project will be covered under section 7 and what will be covered under section 10. The time line is not likely amenable to the completion of both a section 7 consultation and an incidental take permit through section 10 this year.

Service and CDFG staff held a conference call on **September 18, 2002,** to coordinate on pelican mitigation concepts. Staff were in agreement that several of the lagoons in San Diego County can

be considered potential mitigation sites, but some may only provide roost opportunities rather than both roost and fish enhancement opportunities. Space, forage base, and water quality constraints may limit the number of pelicans that can be accommodated in any of these settings. San Diego Bay may offer the best opportunity for a roost in an area with a known fishery resource. We also discussed the need for additional CEQA and NEPA analysis of groundwater pumping if it is to be incorporated into the project mitigation.

Carlsbad staff had a conference call on **September 18, 2002**, with staff from the California-Nevada Operations Office to discuss the letter received from IID dated **August 5, 2002**, and possible approaches to resolving the outstanding issues with the HCP. Seven issues were identified in their letter, and several are complex and require additional evaluation before a solution can be developed.

The Service and CDFG participated in a meeting/conference call with IID on **September 25, 2002**, on outstanding issues related to the HCP. Although final resolutions were not reached, a plan to address each of the issues was developed. The issues discussed include the following. 1) The current proposal for permitting take of Couch's spadefoot toad is lacking a sound basis. We discussed with IID the need to develop conservation goals that they would have to meet prior to the take being authorized. This has been done on other HCPs. These goals would be biologically-based and would support the Service's impact analysis. 2) Permitting take of the other covered species is similarly problematic. We concluded that a similar approach was needed for this group of species as is described above for the Couch's spadefoot with the development of discrete conservation goals. IID agreed to re-evaluate their list and consider removal of species with no known occurrences in the HCP area. 3) The disposition of managed marsh after permit expiration was also discussed. The Service offered the possibility of turning the land over to a third party and water at the agriculture rate as a possible resolution. IID will consider making this commitment of the land to a third party and water at the agricultural rate, but they did not want to be required to continue managing the marsh if no other land management entity agreed to take it. The Service needs to determine if the offer alone is an adequate commitment. 4) Another issue was changed and unforeseen circumstances and where exotic species fit in. We did discuss this issue, and IID agreed to have their consultant try to clarify the commitment with input from the Service on where the ambiguous language occurs. They also agreed to incorporate language into the HCP that identifies the Management Plans as the source of the standards for actions related to routine maintenance and responses to changed circumstances. These will not be developed until after the permit is issued, but they will require Service approval. 5) We also discussed development of justifications that the conservation strategies constitute the "maximum extent practicable". IID agreed to provide additional language in the HCP that gives some indication of the extent of the mitigation and its cost to justify that it would not be reasonable to ask for more. The Service committed to an internal discussion on the issue to determine if this would be adequate to meet the issuance criterion. 6) We also have a problem with addressing third parties and the lack of mitigation requirements from the participants in the program. IID agreed to consider timing restrictions on physical modifications included in efficiency types of conservation as potential minimization measures. They stated that they would not impose requirements on

farmers conserving water through fallowing. The Service recommended that they include a justification for the lack of minimization measures by the farmers in the HCP. 7) The other item that we did discuss was the quantification of incidental take. The Service was clear that take would not be permitted in cases where there was no basis for claiming incidental take. IID requested that take be quantified in habitat parameters to the maximum extent possible, but the Service countered that numbers will be used to the extent that we have the ability to quantify them.

Staff from the Service, CDFG, and the Bureau had a brief coordination call on **September 25, 2002.** In this meeting we identified the benchmark events that keep us on schedule and the significant gaps in our information that remain. The Bureau identified the information that they will be providing in the Errata for the BA as part of this discussion. Resolution on the Federal nexus is still pending.

The Service and CDFG participated in a coordination call on **September 27, 2002.** Bureau staff joined the call in progress. During the call we discussed five issues: brown pelican mitigation for the consultation, an updated project description including a Federal nexus, use of East Mesa groundwater, the time lines for the remainder of the consultation process, and selenium concerns for the desert pupfish. The primary issue for the brown pelican is determining what projects will fully mitigate the impacts. The Bureau agreed to follow up with the Washington Office staff on the Federal nexus issue. Although we will continue to track the potential for use of East Mesa groundwater, it will not be considered part of the project at this time. The consultation period officially closes **October 23, 2002,** and the Bureau will attempt to have the updated project description to the Service by that date. The biological opinion is due **December 9, 2002.** The Service will be working internally to more closely evaluate the water quality issues with the desert pupfish.

A conference call was held among the Service, the Bureau, IID and CH2MHill on **September 30, 2002,** to discuss the water quality results being developed for the Final EIR/EIS. The results indicated an unexpected result for total suspended solids (TSS) in the 75-year run for Alternative 4 (all fallowing). Because the modelers could not explain the result to everyone' satisfaction, it was decided that it would be best to use the original 12 year results and discuss the conclusions qualitatively. In the discussion the margin of error for this constituent was considered to be rather high suggesting that the presumed benefit seen in the 12 year model results was as questionable as the results in the 75-year run. The results will include an explanation of potential modeling error.

Staff from the Service and CDFG participated in the water agency meetings held at the MWD headquarters and facilitated by Assembly Speaker Emeritus Hertzberg on **October 1 and 2, 2002.** The purpose of these sessions were to develop terms to address the remaining areas where agreement had not been reached. Three main topics were addressed by subgroups within the larger meetings: designing the fallowing program, addressing socioeconomic impacts, and achieving environmental compliance. In between sessions, the Service and CDFG met to discuss outstanding issues including the brown pelican mitigation program, the PVID fallowing program,

and coverage of the PVID-MWD transfer or lack thereof under existing Federal and State permits and CEQA/NEPA documents. No state permits have been issued for Colorado River impacts as the applications will not be submitted until SB 482 is in effect with the signing of the QSA.

The farming group developed an approach to fallowing called "low impact fallowing" as it reduces socioeconomic impacts. This fallowing would place more emphasis on the field crops rather than the labor intensive vegetable crops. This will have to be considered in analyzing the impacts of the program on species reliant on field crops for foraging.

The focus of the second day was the development of the term sheet for environmental compliance. Three basic categories of mitigation were considered: up-front commitment of funds, post-termination mitigation requirements, and new listings/unforeseen circumstances. Agreement was reached between the water agencies on the obligations related to the first two, but the third issue was problematic. IID was particularly concerned about this issue given the reduced coverage associated with a section 7 consultation versus a section 10 permit. IID is still pursuing the HCP, and the QSA (as written) will not become effective until the permit is received. This would not preclude signing by December 31, 2002. CDFG raised concerns over the need for additional CEQA analysis with a change in mitigation, but IID offered to provide documentation that they have adequately bracketed the impacts. The Service will likely need additional NEPA analysis prior to issuing a section 10 permit. One outstanding issue remaining was whether the QSA terminates should the water transfer have to stop for environmental reasons or should it be suspended until the impacts are addressed and the transfer can resume. IID prefers the latter because it protects them from challenges regarding beneficial use.

On **October 4, 2002**, Service staff met with CDFG and Bureau staff to discuss brown pelican mitigation. After discussion and input from CDFG, it was decided that the pelican mitigation should include at least two roost sites. These roost sites will require use by a minimum of 100 pelicans each in 3 of the 5 years worth of surveys scheduled to begin one year after project completion. The total number of pelicans addressed will be based on the salinity curve for the 15 year plan and the model output from the REA based on that schedule. For full mitigation a 3:1 ratio will be required by CDFG. The estimated total was approximately 1,000 birds, but the final total is still pending. We suggested that it would be appropriate to have the projects in place by 2010 so that the 5 years of surveys will be complete by the end of the 15 year plan period. This number of birds is required for the life of the permit. Long-term maintenance, monitoring, and adaptive management should be included as part of the program. The Santa Barbara coast and San Diego Bay were identified as the appropriate areas for the two roosts as these are the largest gaps in roost availability for brown pelicans. If these two projects do not meet the success criteria, additional roosts will be required in one of the identified sites or other appropriate sites identified in the future. A barge was recommended for the Santa Barbara site, and floating structures that provide roosts but do not shade the area below were recommended for San Diego Bay.

A second meeting was held on **October 4, 2002**, to review with IID the conservation measures in the Bureau's project as compared to the HCP strategies. There is a high degree of overlap between the two, but the Bureau's program does not provide for coverage of maintenance activities. IID raised the point that some of the measures, such as pupfish connectivity measures will require maintenance. This will be considered. IID would like the conservation program elements to mesh with the future HCP to facilitate the transition. IID also raised concerns about the elements that were added as part of the conservation measures under the Bureau's program and what responsibility they might have for those actions if a future HCP supercedes the section 7. Additional discussions will be required to resolve this issue. The Bureau committed to incorporate additional detail from the HCP on monitoring and management of the conservation measures. IID will discuss internally if they would like to pursue HCP coverage for the brown pelican or other Salton Sea species, but they are aware that the current program would only cover brown pelicans.

A short conference call was held between the Service, CDFG and the Bureau on **October 11, 2002**. During this call we discussed the pelican mitigation package, and it was decided that the information would be shared with the water agencies for their consideration at the upcoming "Hertzberg" meeting scheduled for **October 12-15, 2002**. The Bureau is concerned that it will be necessary to estimated the costs associated with this in order to develop conservation agreements with the water agencies. By providing the concepts to the water agencies, they will be able to tap their engineering resources to develop cost estimates. We discussed the section 7 approach, and it was decided on a recent conference call that the water conservation activities will be considered interrelated/interdependent with the voluntary fish and wildlife measures undertaken by the Bureau. Service staff from the California-Nevada Operations Office participated. The analysis of the California black rail (as a "state-only" listed species) will be considered technical assistance. Given that the conservation measures for the Yuma clapper rail are the same, there will be enforcement capabilities for these measures. We discussed that the incidental take exemption will need to be contingent on the conservation agreements with the water agencies being signed and the conservation measures being implemented. We went over the schedule for the consultation and the NEPA process. The final information from the Bureau will be submitted to the Service on **October 23, 2002**, and a draft of the biological opinion is due to the Bureau on **November 25, 2002**. The final signed biological opinion is due **December 12, 2002**, so that the Consistency Determination from CDFG and the Record of Decision (ROD) by the Bureau can be completed prior to **December 31, 2002**.

The Service, CDFG, Reclamation and CH2MHill held a conference call to discuss the desert pupfish and selenium on **October 16, 2002**. The primary concern is that the existing information suggests that the selenium concentrations within the drains that will result from the project may pose a jeopardy to the pupfish. The focus of our discussion was to find a way to use monitoring to identify a problem before it becomes too serious to manage. Concerns were raised about the model predictions as many drain concentrations have already exceeded the predicted levels. There is great uncertainty associated with the ability to predict changes because the program is voluntary, and we don't know which fields will be involved. Because of the structure of the 15-

year minimization plan being discussed, we will have time to collect field samples and establish the selenium baseline in the drains, conduct the laboratory studies on pupfish sensitivity to selenium, and do baseline surveys consistently throughout these drains to get a better understanding of their use of the drains. Concurrently with those activities, we hope to be able to develop a more consistent method to survey for the species. The group agreed that the time frame of the ramp up of on-farm and system conservation should allow for a monitoring program to identify problems for adaptive management rather than simply document the loss of pupfish in the drains. Given the nature of the program, we will probably not be able to prevent selenium contamination in the drains, but we will have options as to how to treat for it to reduce pupfish exposure. Ultimately, we hope to have a trigger number, either in surrogate fish tissue or in prey items, that can be measured simply and used to determine when adaptive management actions are necessary.

Another call was held on **October 16, 2002**, to discuss the status of the HCP with the Service, CDFG, and IID participating. Rather than discuss specifics of the HCP, we discussed the process that we will be undertaking upon completion of the consultation. The condition now on the QSA is that the HCP is to be complete and the permits issued within one year of the QSA being signed. This is still an ambitious time frame, but it can be met with a concerted effort. IID is still the applicant, but the other water agencies will be taking a much more active role. However, IID does not want to re-open issues that they felt were closed. IID also wants to maintain control over their operations, and they would like to be more involved in the consultation with the Bureau. On the PVID aspect, MWD does not feel they need permits for the in-valley activities.

A brief conference call was held between the Service, CDFG and the Bureau on **October 17, 2002**, to discuss the methods used to quantify the loss of brown pelicans at the Salton Sea. It was decided to put more emphasis on the loss of tilapia rather than the other fish species because these other species are believed to make up a very small part of the pelican's diet. Rather than assume 1/3 loss of the population from 50 to 60 ppt and 2/3 from 60 to 65 ppt, we will assume 10% loss from 50 to 60 ppt and 90% (less the remaining 25) from 60 to 65 ppt. This will be incorporated into the new REA.

Staff from the Service, CDFG, and Reclamation met with staff from IID, MWD, SDCWA, and CVWD to discuss the section 7 consultation on **October 18, 2002**. The purpose of this meeting was to familiarize the water agencies with the voluntary conservation measures that they will be funding as part of the conservation agreements. As we discussed the measures, several issues were raised. With the pelican mitigation, SDCWA identified the need to let the date the obligation must be met by slip if significant numbers of brown pelicans continue to use the Salton Sea longer than we had anticipated. They did not object to the use of the REA, but SDCWA and MWD objected to the 3:1 ratio for full mitigation. This will be raised to higher levels in CDFG. We discussed the pupfish conservation measures, and IID counsel identified the need to examine how these measures might conflict or relate to the State Water Resources Control Board's draft order as it relates to selenium concentrations in the drains. MWD and SDCWA were very concerned about the water quality requirements for the created marsh as too limiting. They don't see this as a beneficial use of Colorado River water. The Service stated that we cannot approve

mitigation, including mitigation for selenium impacts, that involves the use of selenium contaminated water at levels believed to cause direct impacts to the species being addressed by the mitigation. CVWD identified the potential to use tertiary treated wastewater rather than Colorado River water which is acceptable provided it does not result in other problems. We discussed the role of the consultation process versus the HCP process, and the water agencies would like to see language in the biological opinion that describes how the take exemption in the biological opinion and the incidental take permit would function given they overlap. IID and CVWD identified the need to see the conservation agreement(s) and the estimated costs for these activities. Reclamation is working on developing those. IID also asked that operation and maintenance activities be included in this process as necessary for carrying out the requirements of the project, including delivering drain water to the Sea. They are anxious to move forward with the HCP as they do not want long-term involvement of Reclamation and the other water agencies in their day to day operations.

Per a brief phone conversation with Bruce Ellis of the Bureau on **October 23, 2002**, the addition of rail surveys to Rail Measure 3 and the word "monthly" to the sentence on brown pelican surveys in Brown Pelican Measure 1 were approved.

A meeting was held on **November 26, 2002**, among the four water agencies, the Service, CDFG, and CH2MHill to begin the next round of discussions on the water transfer HCP. At the request of MWD, SDCWA, and CVWD this meeting was to update their staffs; no discussions of how to resolve issues took place. IID had prepared a draft schedule that provides benchmarks in order to complete the permitting process by the end of 2003. Concerns were raised that inadequate time was made available to resolve all issues with the HCP, but the deadline may slip if negotiations extend beyond mid-February. The other three water agencies asked to be provided with copies of the current form of the HCP and IA documents along with copies of pertinent correspondence. IID will provide this information. The group reviewed the list contained in IID's August letter to the Service. The nature of these issues should not preclude completing the process on schedule given that some work has already been done to address these issues. CDFG will need to provide input on how SB 482 figures into the process and what the specific requirements/changes will be. The Service committed to seeking guidance on whether a 60- or 90-day review period will be required for the HCP given that it has already been out for public review. This will depend, in part, on the changes that are made from the previously-released version. Another issue that will need to be resolved is whether or not the Salton Sea species are included. The role of the current section 7 should be addressed in the biological opinion being drafted for the Bureau relative to the long-term desire to have those conservation activities fall under the section 10 permit that would be issued relative to the HCP. The Service is developing the appropriate language.

A conference call was held between the Service and the Bureau on **November 27, 2002.** This call provided an opportunity for the Service to update the Bureau on the status of the draft document. The Bureau brought to the Service's attention their concerns about how the fish and wildlife conservation measures and the water conservation activities may be characterized in the draft. We discussed the application of the concept of interrelated effects and concluded this could be

used to characterize the water conservation activities. We also discussed the term of the biological opinion. It will remain in force until the incidental take exemption is no longer needed as a result of the issuance of an incidental take permit. We discussed some of the terms and conditions and the addition of new commitments. This is within what the regulations allow provided these additions constitute minor changes and provide for the avoidance/minimization of incidental take. Some of the standard language in regards to the Bureau's ability to enforce the terms and conditions would need to be reconsidered in light of their role in this process. The Bureau did see the need to provide oversight of documenting the implementation of the measures. The conservation recommendation needs to be re-worded to take into consideration that Congress has only authorized Reclamation to complete studies and pilot projects. We discussed the mountain plover and the difficulties we are having completing the analysis because we are lacking key information regarding this species' winter habitat requirements. Additional studies are required to gather this information in order for us to complete the conference. The Bureau requested that we not conference on that species at this time. Given the current HCP schedule, it will be possible to consider this species needs in the HCP prior to any major changes in the agricultural activities in the Imperial Valley associated with the water transfer. The types of management actions likely to be required fall more appropriately under IID's authorities than those of the Bureau. This change will be reflected in the draft biological opinion submitted to the Bureau on **December 2, 2002.**