APPENDIX F

US FISH AND WILDLIFE SERVICE BIOLOGICAL OPINION

United States Department of the Interior

Fish and Wildlife Service

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

IN REPLY REFER TO:
1-1-02-I-1704

February 27, 2002

Memorandum

To: Regional Director, Mid-Pacific Region, Bureau of Reclamation, Sacramento, California

From: Acting Field Supervisor, Sacramento Fish and Wildlife Office, Sacramento, California

Subject: Biological Opinion for the Central Valley Project Interim Renewal Contracts

With this memorandum, we are transmitting the Fish and Wildlife Service's Biological Opinion on Central Valley Project (CVP) Interim Renewal Contracts. If you have any questions, please contact David Wright or Joy Winckel at (916) 414-6650.

Cay C. Goude

Cay C. Goude

Attachment

cc: ARD-ES, Portland, Oregon
USFWS, Refuge Mgr, San Luis NWR Complex
NMFS, Sacramento
CDFG, Ecological Services Division, Sacramento

Biological Opinion,
Interim Water Contract Renewals,
March 1, 2002- February 29, 2004
Central Valley Project

February 28, 2002
File Number 1-1-02-F-0070

U. S. Fish and Wildlife Service
Sacramento Fish and Wildlife Office
Endangered Species Division
2800 Cottage Way, W-2605
Sacramento, California 95825-1846

Introduction

This is in response to the request from the U.S. Bureau of Reclamation (Reclamation) and Applicants (listed in Appendix A, 2002 Interim Renewal Contracts - Central Valley Project), for formal consultation with the U.S. Fish and Wildlife Service (Service), dated December 21, 2002, on Interim water contract renewals for Central Valley Project (CVP) contractors. Your request was received in our office on December 21, 2002.

This biological opinion is an amendment to the U.S. Fish and Wildlife Service's (Service) February 29, 2000 biological opinion on Interim Water Contract Renewals (Service File # 1-1-00-F-0056) on the effects to the species listed in Table 1 from the proposed action, Central Valley Project (CVP) Interim Water Contract Renewals, in accordance with section 7 of the Endangered Species Act of 1973, as amended (ESA). This amendment to the February 29, 2000 biological opinion addresses the effects of the proposed renewal and the continued delivery by the U.S. Bureau of Reclamation (Reclamation) of 34 Interim contracts and 8 Cross Valley Canal Division water service contracts, in accordance with Section 3404(c) of the Central Valley Project Improvement Act (CVPIA), for a maximum period of 2 years, from March 1, 2002 through February 29, 2004. The water will be used within the Interim and Cross Valley Canal Unit contract service areas for agricultural, municipal, and industrial purposes, and will not exceed water allocations identified by CVP operations criteria in February 2002, including any updates. The Interim water contracts include contractors within the American River Division, Delta Mendota Canal Division, Sacramento River Division, Shasta Division, and the Trinity Division. The Interim and Cross Valley Canal Unit contracts (Interim contracts) that are the subject of this consultation are displayed in Appendix A.

For the purposes of this Interim contract renewal consultation, all conservation measures and non-discretionary terms and conditions described in the biological opinion on long-term contract renewal of Friant Division and Cross Valley Canal Unit Contracts (Friant-Cross Valley Opinion, Service File No. 1-1-01-F-0027) apply to the interim renewal of the Cross Valley Canal Unit contracts for the period of March 1, 2002 through February 29, 2004 or until long-term contracts for the Cross Valley Canal Unit are executed, whichever comes first. Therefore, all conservation measures and non-discretionary terms and conditions of the Friant-Cross Valley Opinion of 2000 relevant to Cross Valley contracts are incorporated by reference into this consultation.

This document represents the Service's biological opinion on the effects of the action on the following species and critical habitat (Table 1A.):

Table 1A: Species considered in this biological opinion, including common name, scientific name, Federal status and whether the species has critical habitat.
Note: Entries in bold indicate species or critical habitat not considered in the 2000 Interim opinion.

Common Name	Scientific Name	Federal Status	Critical Habitat
Alameda whipsnake	***Masticophis lateralis euryxanthus***	**Endangered**	**Yes**
Bay checkerspot butterfly	***Euphydryas editha bayensis***	**Threatened**	**Yes**
Blunt-nosed leopard lizard	*Gambelia silus*	Endangered	
California clapper rail	***Rallus longirostris obsoletus***	**Endangered**	
California jewelflower	*Caulanthus californicus*	Endangered	
California red-legged frog	***Rana aurora draytonii***	**Threatened**	**Yes**
Colusa grass	*Neostapfia colusana*	Threatened	
Conservancy fairy shrimp	*Branchinecta conservatio*	Endangered	
Coyote ceanothus	***Ceanothus ferrisae***	**Endangered**	
Delta smelt	*Hypomesus transpacificus*	Threatened	**Yes**
El Dorado bedstraw	*Galium californicum ssp. sierrae*	Endangered	
Fleshy owl's-clover	*Castilleja campestris ssp. succulenta*	Threatened	
Fresno kangaroo rat	*Dipodomys nitratoides exilis*	Endangered	Yes
Giant garter snake	*Thamnophis gigas*	Threatened	
Giant kangaroo rat	*Dipodomys ingens*	Endangered	
Greene's tuctoria	*Tuctoria greenei*	Endangered	
Hairy Orcutt grass	*Orcuttia pilosa*	Endangered	
Hartweg's golden sunburst	*Psedobahia bahiifolia*	Endangered	
Hoover's spurge	*Chamaesyce hooveri*	Threatened	
Hoover's woolly-star	*Eriastrum hooveri*	Threatened	
Keck's checker-mallow	*Sidalcea keckii*	Endangered	
Kern mallow	*Eremalche kernensis*	Endangered	
Large-flowered fiddleneck	*Amsinckia grandiflora*	Endangered	Yes
Layne's butterweed	*Senecio layneae*	Threatened	
Least Bell's vireo	*Vireo bellii pusillus*	Endangered	
Longhorn fairy shrimp	*Branchinecta longiantenna*	Endangered	

Metcalf Canyon jewelflower	***Streptanthus albidus ssp. albidus***	**Endangered**	
Mountain plover	*Charadrius montanus*	Proposed Threatened	
Northern spotted owl	*Strix occidentalis caurina*	Threatened	Yes
Palmate-bracted bird's-beak	*Cordylanthus palmatus*	Endangered	
Pine Hill ceanothus	*Ceanothus roderickii*	Endangered	
Pine Hill flannelbush	*Fremontodendron californicum ssp. decumbens*	Endangered	
Sacramento Orcutt grass	*Orcuttia viscida*	Endangered	
Salt marsh harvest mouse	***Reithrodontomys raviventris***	**Endangered**	
Sacramento splittail	*Pogonichthys macrolepidotus*	Threatened	
San Joaquin adobe sunburst	*Pseudobahia peirsonii*	Endangered	
San Joaquin kit fox	*Vulpes macrotis mutica*	Endangered	
San Joaquin Valley Orcutt grass	*Orcuttia inaequalis*	Threatened	
San Joaquin wooly-threads	*Monolopia congdonii*	Endangered	
Santa Clara Valley dudleya	***Dudleya setchellii***	**Endangered**	
Slender Orcutt grass	*Orcuttia tenuis*	Threatened	
Stebbins' morning-glory	*Calystegia stebbinsii*	Endangered	
Riparian brush rabbit	*Sylvilagus bachmani riparius*	Endangered	
Riparian woodrat	*Neotoma fuscipes riparia*	Endangered	
Tiburon paintbrush	***Castilleja affinis ssp. neglecta***	**Endangered**	
Tipton kangaroo rat	*Dipodomys nitratoides nitratoides*	Endangered	
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	Threatened	Yes
Vernal pool fairy shrimp	*Branchinecta lynchi*	Threatened	
Vernal pool tadpole shrimp	*Lepidurus packardi*	Endangered	

Table 1B: Species removed from consideration in this amendment due to de-listing or change in action area.

Common Name	Scientific Name	Federal Status	Critical Habitat
Aleutian Canada goose	*Branta canadensis leucopareia*	De-listed	
Bakersfield cactus	*Opuntia basilaris treleasei*	Endangered	
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered	Yes

Changes in this list of species since 2000 are primarily due to the addition of Santa Clara Valley Water District to, and the removal of the Friant Division contractors from, the action area. Critical habitat of the threatened marbled murrelet (*Brachyramphus marmoratus*) also occurs within the service area of the Santa Clara Valley WD; however, we find the action is not likely to adversely affect the murrelet or its critical habitat, because only a few acres occur, in extreme western Santa Clara County, and these only on State lands. In 2000, the Service found the interim contracts not likely to adversely affect Alameda whipsnake, bald eagle, California red-legged frog, and California condor. This amendment alters that finding to *may affect* for Alameda whipsnake and California red-legged frog, again due to the change in action area. Both the whipsnake and the frog have had critical habitat designated since the 2000 Interim opinion.

Federally listed salmonids and their critical habitat occur within or downstream of Interim contract service areas. These species are under the jurisdiction of the National Marine Fisheries Service.

The following actions related to the proposed action are not covered by this opinion and may require separate section 7 authorization:

- Mercy Springs partial assignment delivery to Pajaro Valley Water Management District;
- Any future assignments involving Interim or Cross Valley Canal Unit contractors;
- Transfers involving Interim or Cross Valley Canal Unit contractors;
- Warren Act contracts for conveyance of non-federal water using federal facilities;
- The Mendota Pool Pumpers Exchange Agreement and other non-Central Valley Project waters that are pumped into the Mendota Pool;
- Inclusions and exclusions to Interim contract service area boundaries;
- Future changes in purpose of use from Ag only to Ag/M&I involving Interim or Cross Valley Canal Unit contractors;
- Changes to the CVP M&I shortage policy;
- Supplementary firm supplies of CVP water;

- Any increases in deliveries above actual allocations identified by CVP operations criteria in February 2002, including any updates, or above historical maximum contract quantities analyzed in the Interim biological opinion of 2000 (Service File No., 1-1-00-F-0056);
- Changes to the existing Operations Criteria and Plan (OCAP).

Interim CVP water contract renewals are consistent with the tiered implementation of the CVPIA, as described in the biological opinion on Implementation of the CVPIA (CVPIA opinion, Service File No., 1-1-98-F-0124). It is the Service's understanding that site specific effects of water deliveries to the 34 Interim contracts and 8 Cross Valley Canal Unit water service contracts will ultimately be in section 7 consultations for long-term contract renewals with the Service and the National Marine Fisheries Service.

This biological opinion is based on information provided in the December 7, 2001 draft Supplemental Environmental Assessment and Draft Finding of No Significant Impact prepared for CVP Interim Renewal Contracts; the December 14, 2001 Interim Renewal Contract Consultation Supplemental Information; February 2001 biological assessment (USDI-BOR 2001a); a telephone conversation with Reclamation's South Central Area Office on May 22, 2001 and a followup e-mail with a map of the Grassland Bypass Project area; data from Reclamation collected as part of its Delta-Mendota Canal water quality monitoring program including data from the sumps in the Firebaugh Canal Water District which pumped into the Delta Mendota Canal (Firebaugh sumps); telephone conversations with staff of Reclamation's South Central California Area Office on June 7, 2001; the Staff Report of the California Regional Water Quality Control Board, Central Valley Region on the Review of Selenium Concentrations in Wetland Water Supply Channels in the Grassland Watershed, dated May 2000; and other sources of information. A complete administrative record of this consultation is on file in the Service's Sacramento Fish and Wildlife Office.

Conclusion

The Service has concluded, following the effects analysis below, that the proposed action described in this opinion is not likely to jeopardize the species listed in Table 1A, above, or destroy or adversely modify designated critical habitat.

Consultation History

April 5, 2000: Reclamation provides a memo to the Service regarding the status of Coordination with California Department of Pesticide Regulation (CDPR) in a

joint effort to provide endangered species information to pesticide users consistent with conservation measure *2a.* of the 2000 Interim Contract Renewal biological opinion.

December 12, 2000: The Service submits an insufficiency memo to Reclamation regarding initiation of formal consultation for the long term contract renewal of contracts in the Delta Mendota Canal Unit of the CVP. The memo includes a review of status and compliance with the Interim Contract Renewal Biological Opinion of 2000.

January 30, 2001: Request from Reclamation to the Service initiating formal consultation for interim CVP water service contracts for the period of February 2001 to February 2002.

February 5, 2001: Reclamation provides to the Service a copy of the Draft Supplemental Environmental Assessment for the Renewal of Interim Water Service Contracts through February 28, 2002, Central Valley Project, California, and the draft Finding of No Significant Impact dated February 2, 2001.

February 28, 2001: Reclamation seeks concurrence (via memo) of the Service that the partial assignment of the Mercy Springs CVP contract will not adversely affect any listed species under the jurisdiction of the Service.

February 28, 2001: The Service extends for 1-year until February 28, 2002, the 2000 Interim Renewal Contract biological opinion and concurs with Reclamation's conclusion that the delivery of the partial assignment of CVP contract water from Mercy Springs Water District to the Santa Clara Valley Water District and Westlands Water District (Mercy Springs partial assignment) for use of up to 6,260 acre-feet of CVP water for 1 year from March 1, 2001 to February 28, 2002, is not likely to adversely affect federally listed species.

June 19, 2001: The Service submits a memo to Reclamation regarding concerns over exceedences of selenium levels in wetland water supply channels in the Grasslands Area, and how actions that Reclamation undertakes may influence these exceedences. The memo asked Reclamation to determine if reinitiation of the Interim contract bo was warranted, and further asked Reclamation take steps to correct these selenium issues before initiating consultation with the Service on long-term contract renewal for the Delta Mendota Canal Unit, or an additional interim renewal of the contract.

June 27, 2001: Letters to the Service from the Board of Supervisors, County of Santa Clara and from Board of Directors, Santa Clara Valley Water District which includes commitments on the part of Santa Clara County to 1) prepare a multi-species HCP/NCCP with the goal of completing a draft HCP/NCCP within 3 years and a final HCP/NCCP and incidental take permits within 5 years; and, 2) establish an interim process that will keep conservation and recovery options open for affected species, and to ensure County compliance with ESA and the California ESA during the period prior to approval of the HCP with regard to the issuance of discretionary permits, where federal jurisdiction applies.

October 19, 2001: Memo from Reclamation advising the Service that Reclamation is developing a proposed action of executing Interim Renewal Contracts for a period of 2 years, from 2002 to 2004.

November 19, 2001: Reclamation submits a memo to the Service requesting initiation of informal consultation with the Service on Interim CVP Water Contract Renewals for the period from March 1, 2002 through February 29, 2004.

December 18, 2001: The Service receives a memo from Reclamation dated December 14, 2001 providing supplemental information for the Interim Renewal Contract consultation.

December 19, 2001: The Service submits a memo to Reclamation requesting additional information and requesting that Reclamation initiate formal consultation on Interim Contract Renewals.

January 17, 2002: The Service submits a memo responding to Reclamation's request to initiate formal consultation, and requesting additional information status of implementation of conservation measures/terms and conditions of the Interim biological opinion of 2000.

January 31, 2002: Reclamation submits a memo to the Service responding to the Service's January 17, 2002 for additional information on Interim CVP Contract Renewals.

February 7, 2002: Reclamation and the Service meet to discuss conservation measures proposed by the Service to be added to the project description of the Interim biological opinion.

February 20, 2002: Reclamation provides a written response to the Service regarding the Service's proposed conservation measures to be added to the project description of the biological opinion of Interim Renewal Contracts.

BIOLOGICAL OPINION

Background

The Service previously consulted with Reclamation on CVP Interim contracts in 1995 (file 1-1-95-F-0039), 1998 (file 1-1-98-I-0383), 2000 (file 1-1-00-F-0056) and 2001 (file 1-1-01-I-1211). The November 21, 2000 opinion on CVPIA implementation (file 1-1-98-F-0124) serves as a programmatic document under which other subsequent CVP consultations are tiered. As described in the 1995 and 2000 Interim opinions, Reclamation agreed to implement mitigation measures including development and implementation of a short-term conservation program for the Interim renewal contract service areas (Conservation Measures). The proposed action included a commitment to reinitiate this consultation to develop and implement a long-term program to address the overall effects of the continued operation of the CVP on listed, proposed, and candidate species and a short-term program to minimize the adverse effects on these species in any areas affected by CVP water deliveries other than those to the Interim renewal contract service areas addressed here and those addressed in the Friant consultation.

The short-term program to minimize adverse effects of continued water delivery to the Interim contract water districts includes the following measures:

1(a) Notify districts regarding Endangered Species Act requirements;
1(b) Develop information on distribution and habitat of listed, proposed and candidate species;
1(c) Map and distribute information developed in 1(b) above;
1(d) Monitor land use changes and ongoing activities to ensure project water is not used in a manner that adversely affects listed, proposed or candidate species. Coordinate with the Service on any activities adversely affecting these sensitive species.
2(a) Work with the Service, California Department of Pesticide Regulation and others to develop guidelines and information assessing the effects of pesticides on listed, proposed and candidate species.

2(b) Develop and distribute guidance on construction and maintenance activities.
2(c) Amend criteria for water conservation plans.
3(a) Identify lands critical to listed and proposed species.
3(b) Identify land and water use activities critically impacting listed and proposed species.
3(c) Develop and implement critical need plan.
4 Develop a long term program to address overall effects of the Central Valley Project and Implementation of the Central Valley Improvement Act.

Implementation Status and Needs of Interim Opinion Conservation Measures to Minimize Adverse Effects

The following text provides the Service's assessment of the status of implementation (Status) of certain of the Conservation Measures identified in the Interim biological opinion and identifies what portions of these measures have yet to be completed (Needs). Timelines for completion of Needs are displayed in bold text.

1a. Notify Districts regarding ESA requirements of the Interim opinion.

Status: Complete. Within the first year of the issuance of the Interim opinion of 1995, Reclamation completed the following: included language in Interim contracts requiring compliance with applicable biological opinions; sent a copy of the Interim opinion to all 65 Interim contractors; held workshops in Folsom, Kingsburg, Tracy, and Willows to explain the compliance requirements of the ESA.

In February 2000 Interim contract renewal biological opinion, the Service and Reclamation believed that additional communication is needed with Interim and Friant contractors identifying their obligation to comply with the ESA. As a result, the Interim Opinion of 2000 included the following commitment: *Reclamation and the Service will develop jointly a letter to be distributed* ***within 2 months of this opinion*** *to all Interim and Friant contractors and subcontractors describing their requirements to comply with the ESA.* This notice to the contractors was sent week of July 3, 2000.

Needs: No further action is required for this commitment at this time.

1b. Synthesize existing and new information on distribution and potential habitat of federally listed, proposed, and candidate species within the Districts.

Status: In progress. See 1c below. Reclamation and the Service have established cooperative Geographic Information System team to work on the Central Valley Habitat Monitoring Workplan.

Needs: This task is currently ongoing (see 1c below).

1c. Map (hard copy and digitized) habitat and potential distribution of listed, proposed and candidate species, and provide information to the Districts, the Service, and the California Department of Fish and Game.

Status: Progress has recently been made on this measure. Reclamation and the Service have established cooperative Geographic Information System team to work on the Central Valley Habitat Monitoring Workplan. Reclamation in coordination with the Service is mapping habitat from 1993 and 2000 acquired satellite imagery. Currently, Reclamation and the Service are working to develop a prioritized action plan to complete this mapping effort.

Needs: Data on recent habitat extend, location, spatial arrangement, barriers, and trends is needed for consultations and recovery efforts. To this end, Reclamation will provide to the Service the best data available from the Central Valley Habitat Monitoring Program (CVHMP) to identify remaining natural habitats within the contract service areas prior to initiation of consultation on more long-term contract renewals, or on another interim contract renewal, whichever comes first. These data will be from the 1993 and 2000 CVHMP.

1d. Monitor land use changes and ongoing activities in the Districts to ensure that project water is not used in a manner that adversely affects listed, proposed, and candidate species.

Status: To date we are not aware of progress on this measure. However, the mapping efforts which are currently underway (see 1c above) will assist the ability to monitor land use changes.

Needs: See 1c above.

2a. See Terms and Conditions of 2000 Interim Biological Opinion, item I.A., below.

2b. Reclamation, working with the Service, will develop and distribute to the Districts and landowners guidance on construction and maintenance activities that are most

beneficial to listed, proposed, and candidate species. Complete within 1 year of contract renewal.

Status: Reclamation has written 3 CVP-wide documents that constitute an O&M Plan:

- Operation and Management Plan: an Overview;
- Operations and Management Plan: Field Manual;
- Operations and Maintenance Plan: Sensitive, Threatened, and Endangered Species.

Ongoing progress has been made on this commitment. A roughdraft CCAO Field Operations Manual was submitted to the FWS for review. A draft Operations and Management manual was completed by the SCCAO and distributed to contractors. NCAO is just starting to draft their manual patterned after the SCCAO and CCAO manuals.

Needs: Implementation of this measure is progressing. Reclamation has committed to complete and distribute O&M manuals to all CVP contractors prior to long term contract renewal initiation or on or before another Interim contract renewal period (e.g., before March 1, 2004), whichever comes first.

2c. Reclamation will review water conservation plans for the Districts prior to implementation to ensure they do not adversely affect listed, proposed or candidate species.

Status: On July 7, 2000, Reclamation provided the Service with the following water conservation plan information.

Needs: Regarding implementation of water conservation plans in the future, Reclamation, through informal consultation with the Service, will determine if water conservation plans affect listed species prior to finalizing these plans.

2d. Reclamation will amend the criteria for water conservation plans to ensure consistency with the ESA.

Status: The criteria for water conservation plans is amended every 3 years, consistent with CVPIA. The criteria was last amended in 1999, and the next revision is expected in 2002.

Needs: Reclamation has committed to informally consult with the Service by forming an interagency team that will ensure that the 2002 water conservation criteria is in

compliance with the ESA. Reclamation has committed to send a memo to the Service and NMFS requesting their participation on the team.

3a. Reclamation will identify lands that are critical to the continued survival of listed species and proposed species.

Status: Reclamation and the Service developed the CVP Conservation Program as one of the means to offset the effects of the CVP on endangered species. The Friant and Interim biological opinions specified that Reclamation and the Service would identify critical needs of the species. With time, it became clear the list of conservation actions to be done changed each year with new information. At the time of the Interim Water Contract Renewal consultation in 1995, Reclamation and the Service agreed to annually reexamine the list of actions to be done and identify which ones had the highest priority. This would ensure that important problems were not missed and that money would be used effectively to solve problems. The CVP Conservation Program Framework Document was written to confirm the strategy. All of the species in the area affected by the CVP were included because spending decisions would be done most cost-effectively during the prioritization process. Participation by both agencies would ensure that the interests of Reclamation and the Service would be considered in all decision-making.

The CVP Conservation Program, along with other initiatives [e.g., (b)(1) "other" Program, acquisition of level 2 and level 4 Refuge Water Supplies, and the Wetland Development Program], are intended to ensure that the existing operation of the CVP and implementation of the CVPIA will not jeopardize listed or proposed species or adversely affect designated or proposed critical habitat.

Needs: Reclamation and the Service commit to continue updating and implementing critical needs for listed species survival for all listed species impacted by the CVP. Reclamation and the Service will pursue adequate funding and partners to implement critical needs actions identified through this process. Reclamation is also making a continued commitment to involve other agencies (Federal, State, and local entities) in efforts to cooperatively address the needs of listed species. This will result in cost savings to all involved, will avoid duplication of effort, and will result in an improved cumulative benefit to species.

3b. Reclamation, working with the Service, will implement a critical needs plan. Identify land and water use activities critically impacting listed and proposed species.

Status: Critical needs plans were drafted for Friant and Interim biological opinions. The Recovery Plan for Upland Species of the San Joaquin Valley, California was partially

funded by the CVPIA (b)(1) "other" Program and Reclamation to help identify recovery needs for listed species in the San Joaquin Valley. Critical needs planning associated with species on Friant Division lands has made significant progress. Reclamation's south-central California Area Office continues to provide funding to collect data on critical needs species to meet obligations under the Friant biological opinion.

Needs: Reclamation, as deemed necessary by the Service, will expand their critical needs efforts to ensure the existing operation of the CVP (including Interim contractors) will not jeopardize listed and proposed species or adversely affect designated or proposed critical habitat. Refer to needs identified in 3a above.

4. Reclamation, working with the Service, will develop a long-term program to the address overall effect of the CVP and implementation of the CVPIA.

Status: Reclamation has been undertaking actions that have contributed to the survival of listed species throughout the Central Valley. Reclamation has also been implementing measures to prevent/minimize take of species through operations and maintenance actions.

The Service, with assistance from Reclamation, completed a final biological opinion on the Implementation of the Central Valley Project Improvement Act and Continued Operation and Maintenance of the on November 21, 2000 (Service File No., 1-1-98-F-0124). Reclamation's annual budgets have included approximately $2.5 million annually since 1998 for meeting listed species critical needs.

Needs: Reclamation and the Service will pursue adequate funding and partners to implement any requirements included in the final biological opinion on the Central Valley Project Operation and Maintenance and implementation of the Central Valley Project Improvement Act.

Future CVP Actions

In addition to the conservation measure referenced above the Interim opinion of 2000 included commitments related to future Reclamation actions. The status and needs associated with implementation of these commitments are presented below.

Changes in purpose of use of contracts: Reclamation will consult on all future changes in purpose of use of in water contracts from Agriculture only to Agriculture/M&I purposes.

Status: The Service is unaware of any changes of purpose of use executed since the 2000 Interim opinion.

Needs: Reclamation will provide the Service with an analysis of how future changes in purpose of use will affect shortages to districts, and how these changes in allocations will affect CVP-wide water supplies, including water for fish and wildlife, under drought conditions. No changes in purpose of use will be executed unless it can be shown that such changes will not reduce water supplies benefitting listed species authorized by the CVPIA below those predicted in the CVPIA PEIS.

Future Assignments involving Interim contractors: For assignments of Interim water that may affect listed species, Reclamation will initiate informal consultation with the Service. For those contracts or actions with direct or indirect effects that are likely to adversely affect listed species, or result in take, Reclamation will consult formally with the Service. Reclamation, through informal consultation with the Service, will determine if an action will not affect listed species prior to signing of the FONSI or ROD.

Status: The Service is unaware of any new contract assignments being executed since the 2000 Interim Opinion. Reclamation currently is informally consulting with the Service on two proposed assignments: Banta Carbona to City of Tracy and Mercy Springs to Westlands Water District.

Needs: Reclamation will continue implementation of this measure.

Future Inclusions, Annexations and Exclusions to contract service area boundaries: For inclusions or annexations involving the Interim contractors in this opinion that may affect listed species, Reclamation will initiate informal consultation with the Service. For those inclusions with direct or indirect effects that are likely to adversely affect listed species, or result in take, Reclamation will consult formally with the Service. Reclamation, through informal consultation with the Service, will determine if the inclusions or annexations will not affect listed species prior to signing of the FONSI or ROD.

Status: The information package and status tables Reclamation provided for this consultation included documentation of inclusions (annexations) in the Sacramento Valley subsequent to the 2000 Interim biological opinion (e.g., 3930.03 acres annexed to Clear Creek Community Services District and 161.98 acres in Bella Vista Water District). These annexations were completed without informal consultation with the Service. Reclamation has agreed to review these inclusions with us after the fact.

Needs: Reclamation, through informal consultation with the Service, will determine if their inclusions or annexations affect listed species prior to finalizing the action or signing of the FONSI or ROD. Any listed species effects of annexations in the Redding area that were done since the CVPIA opinion without consultation with the Service should be addressed by Reclamation.

Transfers involving Interim contractors

Reclamation will apply the following criteria to all transfers and exchanges (from the date of this opinion up to long-term contract renewal) involving Interim or Friant Division contractors that have not already under gone section 7 consultation:

> *1. Transfers and exchanges will be executed for **one year only** for any district that does not have an established listed-species baseline as described in the biological opinion on operations and maintenance of the Central Valley Project and implementation of the Central Valley Project Improvement Act of 1992;*
>
> *2. Transferred or exchanged water will be delivered and applied only to areas that were in cultivation from October 15, 1991 (the date of the Friant biological opinion), until one of the following occur and there is no net loss of potential listed-species habitat as a **direct or indirect** result of the transfer:*
>
> *a. consultation on the effect of putting the area into cultivation has been completed, or,*
> *b. there is an HCP in place that addresses impacts to the area receiving the water, or,*
> *c. the CVP Conservation Program has a line-item, specific increase in funding to compensate fully for the transfer and is in place prior to the transfer.*
>
> *3. All other non-historic CVP transfers and exchanges that do not meet the above criteria will require separate section 7 or section 10 authorization.*

Status: Reclamation has consulted on the following transfers since Interim contract renewal, these transfers were renewed for 1-year until listed species baseline could be established: Exchange Contractors Water Authority, Service File No., 1-1-I-00-1288; and Historic Inter-District CVP Transfers, Service File Nos., 1-1-I-00-1118 and 1-1-00-I-1024, Friant Historic and Warren Act, Service File No., 1-1-02-I-0102), and South of Delta Historic, Warren Act, and San Joaquin Exchange Contractors, Service File No., 1-1-02-I-0903.

The effects on delta smelt of transfers involving CVP water delivered through the Delta Mendota Canal or San Luis Canal, wheeled through the CVP or SWP, and totaling up to 250,000 acre-feet annually were addressed in the 1995 OCAP biological opinion.

Needs: For Warren Act, water wheeling, Surplus Flood Flow water contracts, and water transfers, Reclamation and the Service will establish a tracking program that assures compliance with the ESA.

The effects of additional "transfers" (i.e., exceeding a cumulative 250,000 acre-feet annually) on delta smelt, as well as the indirect effects of all transfers on terrestrial species, have not yet been addressed and will undergo consultation as may be required when such transfers are proposed. Because of the high number of transfers that occur annually, the Service and Reclamation are collaborating on streamlining the consultation process to allow for expedited consultation on water transfers.

Terms and Conditions from 2000 Interim Opinion

In addition to the conservation measures referenced above, the Interim opinion of 2000 included non-discretionary terms and conditions which Reclamation must comply with in order to be exempt from the prohibitions of section 9 of ESA. The status and needs associated with the implementation of these terms and conditions are presented below.

I.A. *Reclamation, with assistance from the Service, will work with the California Department of Pesticide Regulation (CDPR) to develop guidelines that provide an update that on work that has been completed on this measure. Reclamation will provide to the Service* ***within 1 month*** *from the issuance of this opinion a status report related to this measure. In addition, Reclamation, working with the Service, will provide information to CDPR generated from mapping efforts described in Conservation Measure 1(c) of the Project Description as information is generated and that new information will be provided to CDPR to be posted on their web site for listed species information. Should CDPR not post this information Reclamation will post this information on their own web site.*

A related conservation measure, numbered 2a, was provided in the project description of the 2000 Interim biological opinion.

Status: Reclamation provided a memo to the Service regarding the status of Coordination with California Department of Pesticide Regulation (CDPR) in a joint effort to provide endangered species information to pesticide users.

Needs: Reclamation, working with the Service, will provide information to CDPR generated from 1c above, and from other sources, as appropriate, as information is generated and that new information will be provided to CDPR for posting on their web site for listed species information.

II. *Reclamation will identify land and water use techniques or measures within CVP service areas which are critically impacting listed and proposed species or their habitats.*

A. ***Within 60 days of this opinion*** *Reclamation, in consultation with the Service, will prepare a study plan to identify the sources of selenium contamination in the Grasslands, San Joaquin River, and south Delta estuary. The study plan to be developed will identify and quantify all known sources of selenium that contribute to contamination of water supplies to the Federal, State and private wetlands of the Grasslands area, the San Joaquin River, and southern Sacramento-San Joaquin Delta. Included in such a plan should be an analysis identifying and quantifying loads from known sources such as the Delta-Mendota canal pumping project, the Mendota Pool group groundwater pumping project, and discharges into the San Luis Drain from Panoche Creek flood flows. Further, the plan should provide information regarding ongoing efforts to reduce selenium in the Grasslands Area, other studies being conducted related to this venture, and any applicable reports from other investigations that have been completed (e.g, California Central Valley Regional Water Quality Control Board investigations).*

Status: In status report tables that Reclamation provided to the Service on July 7, 2000, October 18, 2000, and December 14, 2001, Reclamation stated that this requirement is already being handled through the existing Grassland Bypass Project monitoring program. Although some monitoring is ongoing in the Grasslands, there is no monitoring being conducted, as part of the Grasslands Bypass Project, for selenium contamination in the Mendota Pool, the San Joaquin River downstream of Crows Landing, or the Delta, nor does the Grassland Bypass Project monitoring seek to identify and quantify all sources of selenium contaminant loading as described. To date, no study plan has been provided to the Service fully addressing this term and condition of the Interim Biological Opinion.

The Grassland Bypass Project biological opinion of September 27, 2001 (Service File No., 1-1-01-F-0153) included non-discretionary terms and conditions to seek funding to complete studies that would 1) track selenium loading, including loads from the Grassland Drainage Area into the San Joaquin River, the Sacramento-San Joaquin Delta, and the North Bay (e.g., Suisun Bay); 2) model and/or monitor effects of Delta hydrodynamics (e.g., including the effects of State and Federal pumps, South Delta Barriers, supplemental flows for anadromous fish and listed species) on the fate of selenium from the San Joaquin River into the Delta and North Bay estuary during differing water year types; and 3) Identify and track the sources of selenium contamination in Grassland wetland supply channels source water responsible for exceedences of the Federal/State 2 *u*g/L standard for wetland water supplies in the Grasslands area.

Since March 2000, the wetland water supply objective of 2 ppb selenium (monthly mean) was exceeded two months in Camp 13, three months in Agatha Canal, nine months in the San Luis Canal, and two months in the Santa Fe Canal. All of these canals convey water supplies from the Delta Mendota Canal to Grassland wetlands. A water concentration of 2 ppb selenium was exceeded in the DMC 1/2 mile downstream of the Firebaugh sumps in 7 of 24 samples from 1999 through 2001. Data from the DMC upstream (Farm Bridge) and downstream (Washoe Ave) in 1999-2001 show that selenium concentrations in the Delta Mendota Canal increased downstream of the Firebaugh sumps in 30 of 36 samples. The average increase in concentration was 0.94 ppb. Seasonally, the exceedances in 1999-2001 occurred in the winter and spring (December to April).

Needs: The Service believes selenium contamination in the Grasslands area and downstream is of serious concern for the federally threatened giant garter snake and Sacramento splittail. We believe substantial further progress remains to be made in addressing this issue and the relevant terms and conditions. Further, the selenium accounting information requested by the Service is needed to complete the DMC unit long term contract biological opinion as stated in a memo to Reclamation dated December 12, 2000 (file 1-1-01-I-0417). The DMC long-term consultation was initiated, but requested by Reclamation to be placed on hold, or at a lower priority than the present consultation.

B. *Reclamation will develop and implement a Service approved monitoring program* ***within 6 months of this opinion*** *to assess the effects of selenium loading within the San Joaquin River on aquatic listed species or their surrogates (including but not necessarily limited to Sacramento splittail, Delta smelt, and giant garter snake) using the lower San Joaquin River and*

southern Sacramento-San Joaquin Delta. Such a program should determine tissue concentration for these species (or appropriate surrogates) collected from these areas. ***Initial data from this program will be made available to the Service to be used in the effects analyses of long-term contract renewal on aquatic listed species and used to minimize take.***

Status: Reclamation has partially complied with this term and condition. Reclamation provided the Service with $15,000 for analytical work on fourteen Sacramento splittail specimens that were collected at the State and Federal pumps in FY 2000. The splittail were analyzed for selenium, boron, and other contaminants. Also see Status write-up under 2.A. above.

Needs: In addition to the Needs under 2.A. it is unknown at this time, how much, selenium from the CVP service areas and the San Joaquin River is reaching the Delta, or how these discharges may be affecting listed species. As a result, Reclamation, together with the Service and other appropriate agencies, will either seek from CALFED direct funding or will prepare a proposal through the CALFED proposal solicitation process to develop a selenium budget, to determine the sources, fate and impact of all selenium discharges in the San Joaquin River including those from the proposed action to presently impaired downstream water bodies used by listed species (e.g., giant garter snake, delta smelt and Sacramento splittail) including Mud Slough (North), the San Joaquin River, and the North Bay (e.g., Suisun Bay) and Sacramento-San Joaquin Delta.

C. *If selenium concentration in refuge water supplies exceeds the 2ug/l monthly mean standard for wetland water supplies in the Grasslands, and this contamination is a result either directly or indirectly from Reclamation actions, Reclamation will identify and implement corrective actions and initiate separate formal consultation with the Service.* ***Reclamation will provide quarterly reports to the Service on locations of monitoring and monitoring results****. These reports can be in conjunction with the monitoring and reporting required under the January 20, 1998, Interim Water Contract Renewal Opinion amendment (Service file #1-1-98-I-383).*

Status: Reclamation noted in their Quarterly Status Report Table provided to the Service on July 7, 2000, that this term and condition was being handled with the existing monitoring program and existing quarterly reports. However, the Service believes that Reclamation was not in compliance with this term and conditions on several occasions. The Service contacted Reclamation in two separate memos regarding compliance with this term and condition (December 12, 2000, File, 1-1-1-01-I-0417, and, June 19, 2001, File). In addition, the Service contacted Reclamation on January 17, 2002 requesting

that Reclamation provide conservation measure(s) to be incorporated into the project description of this consultation relative to the operation and maintenance of the sumps in the Firebaugh Canal Water District that will reduce or eliminate this selenium loading into wetland water supply source water.

Since March 2000, the wetland water supply objective of 2 ppb (monthly mean) was exceeded two months in Camp 13, three months in Agatha Canal, nine months in the San Luis Canal, and two months in the Santa Fe Canal. All of these canals convey water supplies from the Delta Mendota Canal to Grassland wetlands. Reclamation has failed to identify the problem and implement corrective actions, nor has the agency initiated separate formal consultation with the Service as required by the term and condition.

Needs: Reclamation needs to immediately reduce selenium contamination in the area and effectively coordinate with the Service's SFWO Endangered Species Division on this term and condition. Specifically, Reclamation should take necessary steps to correct selenium contamination issues in wetland water supplies in the Grasslands. Information on what measures Reclamation is taking, and their effectiveness, is needed for the DMC long-term contract renewal consultation and the O&M consultation.

III. *Identify, analyze and compensate for past effects since 1995 for Interim contractors.*

B. *Reclamation will identify and analyze the impacts of changes to contract service area boundaries since 1995 for Interim contractors and provide this information and the associated GIS data layers to the Service* ***prior to initiation of consultation for long-term contract renewal****. Reclamation will fully compensate for any impacts associated with past changes to contract service area boundaries for Interim contracts* ***prior to long-term contract renewal or an additional interim period.***

Status: Reclamation provided the Service with draft maps in May 2000 showing changes in interim contract service area boundaries (from year 1995 to year 2000) and acreage changes by district. Further information and analysis is expected to be provided in long-term contract renewal BA's.

Needs: Reclamation and the Applicants, as appropriate, should take immediate steps to identify and fully compensate for impacts to listed species resulting from past changes to contract service area boundaries for Interim contracts in compliance with this term and condition.

C. *Reclamation will identify and analyze the impacts of changes in purpose of use since 1991 for Friant contractors and 1995 for Interim contractors and provide this information and analysis to the Service* ***prior to initiation of consultation for long-term contract renewal or reinitiation on OCAP*** *. Specifically, Reclamation will provide to the Service* ***prior to long-term contract renewal or an additional interim period*** *an analysis on how changes in purpose of use will affect shortages to districts, and how these changes in allocations will affect CVP-wide water supplies under drought conditions.*

Status: In their Status Report Tables provided to the Service on July 7, 2000, and December 14, 2001, Reclamation stated that the 1995 Interim contract renewal consultation covered "change of purpose of use from Ag to M&I." This was not the case. Sixteen of Interim contracts covered under the interim biological opinion of 1995 were changed from Ag only to Ag/M&I Contracts subsequent to the completion of that opinion. The changes of purpose of use were not covered in the Interim biological opinions of 1995 or 2000. The Service has not consulted on the changes to purpose of use in these contracts, and therefore any take associated with these actions is not covered. The 1997 draft CVPIA Administrative Proposal on M&I shortage policy stipulates that the Ag shortage provisions are still applied if contracted purpose of use was changed to include M&I subsequent to 1994. Reclamation proposed changes to the M&I shortage policy on September 11, 2001 (66 **FR** 54780). The Service provided comments to Reclamation on these proposed changes to the M&I shortage policy on December 5, 2001 (Service File No., 1-1-02-I-0318) and requested that Reclamation initiate formal consultation on this policy.

Needs: Reclamation needs to identify and analyze the impacts to listed species and critical habitat of changes in purpose of use since 1995 for Interim contracts and the revised M&I shortage policy, and to provide this information and analysis to the Service prior to initiation of consultation for long-term contract renewal or reinitiation of OCAP. Specifically, Reclamation should provide a Biological Assessment for the water shortage policy and initiate section 7 consultation to address the effects of the shortage policy on federally listed species and environmental commitments described in the Friant, Interim, CVPIA PEIS, OCAP and CalFed biological opinions.

D. *Reclamation will identify and analyze the impacts of all water assignments executed since 1995 for Interim contractors and provide this information to the Service* ***prior to initiation of consultation for long-term contract renewal****. Reclamation will fully compensate for any impacts associated with*

past water assignments of Interim and Friant Division water allocations ***prior to long-term contract renewal or an additional interim period.***

Status: In Status Report Tables provided to the Service on July 7, 2000, October 18, 2000, and December 14, 2001, Reclamation noted that information gathering and data analysis for this term and condition is ongoing. Reclamation further noted that information will be provided in BA's for Long-Term Contract Renewal.

Needs: Reclamation will identify and analyze in BA's for long-term contract renewals the impacts of all water assignments executed since 1995 for Interim contractors and provide this information to the Service. Reclamation and the Applicants, as appropriate, should compensate for any listed species impacts associated with past water assignments of Interim water allocations**.**

IV.A-F. *Consult with the Service on future actions including changes in purpose of use of contracts, transfers involving Interim or Friant Division contractors, assignments, and inclusions, annexations and exclusions to contract service area boundaries.*

Status and Needs: See earlier discussion under **Future Impacts**.

V. *Develop and implement a program to compensate for losses of listed species habitat that occur as a result of delivery of Central Valley Project water to the Interim and Friant Division contract service areas.*

A. *Reclamation and the Interim and Friant Division contractors will establish a contingency plan that would develop and implement a process to identify impacts and then address those impacts to listed species or their habitats within the Interim and Friant Division's contract service area that occur as a result delivering CVP water to the contractors.*

And

B. *Reclamation will ensure implementation of the contingency plan to address impacts to species or their habitats within the Interim and Friant Division's contract service area that occur without a Service incidental take authorization.*

And

C. *The contingency plan for impacts to listed species or their habitat will be reviewed in a Section 7 consultation with the Service and will incorporate compensation for temporal and other habitat losses. Losses of listed species habitat within the Interim and Friant contract service areas will be compensated at ratios consistent with the recovery needs for those listed species.*

Status: In the Status Report Tables received by the Service on July 7, 2000, October 19, 2000, and December 14, 2001, Reclamation noted that the contingency plan to address impacts to species or their habitats within the Interim and Friant Division's contract service area was "in development" or "pending". The Service is unaware of the specific progress that has been made on these term and conditions for Interim contractors, although a draft document for the Friant Division has been prepared.

Needs: Reclamation and the Applicants, in coordination with the Service should prepare a contingency plan to address impacts to listed species or their habitats within the Interim contract service area**.** Reclamation and the Applicants should finalize and implement a contingency procedure to compensate for losses of endangered species habitat within the CVP place of use since 1993 before initiating consultation on long-term contract renewals or on another Interim contract renewal.

Project Description

The purpose of the proposed action is to execute 42 interim contracts listed in Appendix A for up to two years between March 1, 2002 through February 29, 2004. The interim contracts fall within the following divisions of the CVP: American River (n=3), Cross Valley Canal Unit (n=8), Delta Mendota Canal (n=14) which includes a partial contract assignment from Mercy Springs that will be shared by Westlands Water District in the San Luis Unit and Santa Clara Valley Water District in the San Felipe Division, Sacramento River (n=14), Shasta (n=1), and Trinity divisions (n=2). Differences between the 2000 Interim contractors and the 2002 Interim contractors are as follows. Covered in 2000 but not included in 2002 are Friant Division, Buchanan and Hidden Unit contractors that have since completed consultation on long-term water contracts (Service file 1-1-01-F-0027). Included in 2002 but not in 2000 is the delivery of water from the partial assignment of Mercy Springs Water District in the Delta Mendota Canal Division to Westlands WD, and Santa Clara Valley WD. The proposed action does not include construction of a conveyance structure nor delivery of the Mercy Springs partial assignment to Pajaro Valley Water Management District (Pajaro VWMD). The construction of a conveyance structure which would allow delivery of water from the Mercy Springs WD assignment to Pajaro VWMD is not expected to be completed during the 2-years of this project (pers. comm. R. Eckart, Reclamation, February 19, 2002). Reclamation will consult with the Service on the effects of the construction of a conveyance structure as well as the delivery of CVP water to Pajaro VWMD. The proposed action also includes the execution of contract No. 14-06-200-7312-IR5 with El Dorado Irrigation District for Lake Hills Estates. However, we are not including deliveries to Lake Hills Estates in the analysis or incidental take authorization of this opinion. It is the Service's understanding that this contract will not be delivered until after long term contracts are executed (Michny in litt., February 20, 2002).

Execution of interim contracts is needed to continue delivery of CVP water to interim contractors until the long-term contracts can be executed. The period of renewal for each contract would be for one year, as permitted under subsection 3404(c)(1) of the CVPIA. The current contract provisions are those that are included in the existing interim renewal contracts. If long-term contracts are not executed by March 1, 2003, a one year extension of these interim contracts (March 1, 2003 through February 29, 2004) may be executed.

A notice was sent to Interim contractors the week of July 3, 2000 describing requirements to comply with the ESA. In addition, Article 3(b) of the Interim contract includes mutual and dependent covenants mutually agreed upon by the parties, related to Water to be Made Available and Delivered to the Contractor as follows, "The

Contractor shall utilize the Project Water made available to it pursuant to this interim renewal contract in accordance with all applicable requirements of any Biological Opinion addressing the execution of this interim renewal contract developed pursuant to Section 7 of the ESA of 1973 as amended, and in accordance with environmental documentation as may be required for specific activities, including conversion of Irrigation Water to M&I Water."

Water will continue to be delivered to the Interim Water Service Contractors and Cross Valley Unit Contractors in quantities that approximate amounts provided in Appendix A. Reclamation and the Service will coordinate, for ecosystem-level planning purposes relative to water deliveries to CVP contractors. Reclamation will provide information to the Service on annual deliveries each year, prior to or concurrent with informing the water districts provide on their allocation amounts. However, it is understood that biological opinions for OCAP (1-1-94-F-70) and Los Vaqueros (1-1-95-F-117 and 1-1-95-F-134) are in place, and the total amount of these CVP deliveries cannot exceed the total consolidated amount considered in these opinions.

No changes to district boundaries are part of the proposed action, although the proposed action does include two new districts not considered in the Interim opinion of 2000: Westlands WD and Santa Clara VWD. Reclamation, through informal consultation with the Service, will determine if their inclusions or annexations affect listed species prior to finalizing the action or signing of the FONSI or ROD.

No water transfers are part of the proposed action. Appropriate environmental compliance and section 7 consultation will be completed for any request from interim contractors for Reclamation approval of water transfers. Potential impacts arising from future assignments of water are not included in the proposed action. They are separate independent actions and will require their own environmental compliance and section 7 consultation.

Key Assumptions

Because of the complex history as well as the complex present environmental and regulatory context of Interim Water Contract renewals, and because this action is interrelated and interdependent with a number of other Reclamation actions, we have had to make a number of assumptions about likely future events and context of the action. While not exhaustive, the following list of key assumptions has been central to our effects analysis and jeopardy findings. As such, the failing of any key assumption should be considered reason for reinitiating consultation on the 2002-2004 Interim Water Contract renewals. The Service assumes the following:

1) The County of Santa Clara, the City of San Jose, and the Santa Clara Valley WD will carry out HCP commitments set forth in two letters to the Service, dated June 27, 2001 from Tony Estremera, Chair, Board of Directors, Santa Clara Valley Water District, and from James T. Beall, Jr., Chairperson, Santa Clara County Board of Supervisors, including: completion of an HCP/NCCP within 5 years and establishment of an interim process to ensure County and City compliance with the ESA during the period prior to approval of the HCP with regard to the issuance of discretionary permits.
2) Reclamation will implement in a timely manner relevant environmental commitments, mitigation and conservation measures, and terms and conditions from other biological opinions, including but not limited to: the 2000 Interim Opinion (February 29, 2000, Service File No., 1-1-00-F-0056), Implementation of the CVPIA and Continued Operation and Maintenance of the CVP (November 21, 2000, Service File No., 1-1-98-F-0124), the Friant Long Term Contract Renewals (Service File No., 1-1-01-F-0027) and the Grassland Bypass Project (Service File No., 1-1-01-0153). Other CVP-related, non-CVPIA (Central Valley Project Improvement Act) actions benefitting fish, wildlife, and associated habitats and related to effects of Interim Contract Renewals will continue, with at least current funding levels, including:
    - the Comprehensive Mapping Program;
    - implementation of the Land Use Monitoring and Reporting Program
    - CVP Conservation Program and B(1)(other) Habitat Restoration Program.
3) Reclamation will implement the Project Description in a manner consistent with implementation of any listed species recovery plans, including the 1998 Recovery Plan for Upland Species of the San Joaquin Valley, the 1999 draft Recovery Plan for Giant Garter Snakes, the 1996 Recovery Plan for the Sacramento / San Joaquin Delta Native Fishes, and the 1998 Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area.
4) We understand from Reclamation's memorandum of February 20, 2002, that Reclamation will be beginning action to address selenium concerns relative to the Firebaugh sumps. We assume Reclamation
    - will not contribute to exceedences of the 2 ppb selenium standard for surface waters in the Grasslands Bypass Project Area
    - will not discharge any waterborne selenium in concentrations constituting hazardous waste under State law
    - will not impair, through additions to selenium load, the ability of Grasslands Bypass Project participants to meet Basin Plan water quality objectives

5) The EPA is required under the biological opinion for the California Toxics Rule to propose and promulgate a new selenium standard that would apply to all waters of the Grassland Bypass Project area (see the discussion of the California Toxics Rule in the Background section). We assume that all applicable, selenium-related commitments in the California Toxics Rule biological opinion will be met. Accordingly, EPA should propose revised acute and chronic aquatic life criteria for selenium in California by January of 2003, and finalize the criteria no later than July, 2004. We assume that these revisions for selenium water criteria and standards will be adequately protective of Sacramento splittail, giant garter snake, and other listed species. This process will include adoption of any new selenium objectives for selenium into the State of California, Regional Water Quality Control Board (Central Valley Region) Basin Plan and approval by the State Water Resources Control Board and the State Office of Administrative Law.

Species Accounts

Please refer to the 2000 Interim opinion for species accounts for most of the species in Table 1A. Accounts for species and critical habitat newly included in this amendment follow alphabetically by common name, below.

Alameda Whipsnake

The Alameda whipsnake was federally listed as threatened on December 5, 1997. A detailed account of the taxonomy, ecology, and biology of the whipsnake is presented in the listing (62 **FR** 64306) and critical habitat determinations for this species (65 **FR** 58933). Supplemental information is provided below.

The Alameda whipsnake inhabits the inner coast range in western and central Contra Costa and Alameda counties, and portions of northern Santa Clara County and western San Joaquin County. There are five remaining populations with little or no genetic flow between them: the Tilden-Briones population, the Oakland-Las Trampas population, the Mount Diablo-Black Hills population, the Hayward-Pleasanton Ridge population, and the Sunol-Cedar Mountain population.

The Alameda whipsnake is distinguished from the more common chaparral whipsnake *(M. l. lateralis*) by a sooty black dorsum, by wider yellow-orange stripes that run laterally down each side, the lack of a dark line across the rostral, an uninterrupted light stripe between the rostral and eye, and the virtual absence of spotting on the venter of the head and neck. The first four populations described above are genetically isolated, and considered to be the listed entity. Alameda whipsnakes found in the Sunol-Cedar Mountain population can hybridize freely with the chaparral whipsnake. Whipsnakes found within this population are the listed entity, if they show the diagnostic characteristics of the Alameda whipsnake and they more closely resemble the listed taxon than the entity intermediate between it and other non-listed conspecifics.

The Alameda whipsnake is typically found in northern coastal scrub or chaparral plant communities, and also occurs in adjacent grasslands and woodlands. The whipsnakes appear to prefer open-canopy stands and habitats with woody debris and exposed rock outcrops, and they tend to be found on southeast, south, and southwest facing slopes. Alameda whipsnakes have been found inhabiting northern exposures in open stands of chaparral.

Alameda whipsnake have been shown to have home ranges varying in size from 1.9 to 8.7 hectares (5.0 to 21.5 acres), and there is considerable overlap of home ranges. Some animals have been recorded to have moved over 1.8 kilometers (1 mile) while crisscrossing their home

range. Alameda whipsnakes have been shown to travel distances greater than 152.5 meters (500 feet) over grassland to exposed rock outcrops.

The Alameda whipsnake is a lizard-eating specialist, but its diet may include other prey, such as rattlesnakes and nesting birds, depending on the whipsnake's size, sex, age, and location. Alameda whipsnakes utilize open canopy stands of scrub habitat containing rock outcrops because these habitats provide areas for basking, cover from predators, and an ample source of prey. The major prey base for the Alameda whipsnake is spiny lizards (*Sceloporus* spp.), such as the western fence lizard, which spend much of their life cycle around rock outcrops.

Alameda whipsnakes breed from March through June, with mating seeming to occur near the hibernacula of the female. The only evidence of Alameda whipsnake egg-laying is within a grassland community that lies adjacent to a chaparral community. Whipsnakes lay clutches during May through July, and the young hatch and emerge in the late-summer to early-fall . Individuals of the genus *Masticophis* have been described as nervous, restless, and seemingly intent on avoiding human contact.

Current threats to Alameda whipsnake habitat are urban development and associated impacts due to increased human population densities, fire suppression and the resulting likelihood of catastrophic wildfires, increased predator pressure, and incompatible grazing practices. The central and western portions of Alameda, Contra Costa, and Santa Clara counties are highly urbanized and continue to be subjected to increased urbanization. Habitat fragmentation from urban development and associated highway and road construction has reduced the amount of habitat available for whipsnake, and has led to isolation of the five populations by preventing or severely reducing movement of individuals between areas of suitable habitat.

The Alameda whipsnake is threatened directly and indirectly by the effects of fire suppression. Encroaching urban development has necessitated the implementation of rigorous fire suppression practices in and around suitable habitat areas for the Alameda whipsnake to protect people and property. East Bay Regional Park District (EBRPD) guidelines state that prescribed burning on EBRPD lands is limited because of the urban-parkland interface and risk of the fire escaping control lines. This is typical for land management agencies, which are unable to conduct prescribed burns due to the prevailing public sentiment. Prescribed burns would serve to decrease flammable fuel loads and maintain suitable habitat conditions for Alameda whipsnake. The direct effect of fire suppression on the whipsnake is an increased risk of catastrophic wildfire. Fire suppression exacerbates the effects of wildfires through the buildup of fuel (underbrush and woody debris), creating conditions for slow-moving, hot fires that completely burn all sources of cover for the Alameda whipsnake. Highest intensity fires occur in the summer and early fall, when accumulated fuel is dry. During this period, hatchling and adult Alameda whipsnakes are aboveground, and populations are likely to sustain the heaviest losses

from fires.

The main indirect effect of fire suppression is alteration of canopy structure in scrub habitat, which decreases its suitability for whipsnake. Fire suppression allows plant overgrowth, creating a closed canopy that will tend to create relatively cool conditions. Alameda whipsnakes have a high mean active body temperature (33.4 degrees centigrade) and a higher degree of body temperature stability (stenothermy) than has been documented in any other species of snake under natural conditions. Alameda whipsnakes apparently can maintain this high, stable body temperature by using open and partially open and/or low growing shrub communities that provide cover from predators while providing a mosaic of sunny and shady areas between which Alameda whipsnakes can move to regulate their body temperatures. Tall, shaded stands of vegetation, such as poison oak, coyote brush, and other vegetation may not provide the optimum temperature gradient for Alameda whipsnakes. Survey data show that Alameda whipsnakes are less likely to be found where these plant species create a closed canopy. Optimal habitat for the species has an open canopy, while a closed canopy decreases the suitability of habitat for this snake.

In areas where whipsnake habitat has become fragmented, isolated, or otherwise degraded by human activities, increased predatory pressure may become excessive, particularly where non-native species such as Norway rats *(Rattus norvegicus*), red fox (*Vulpes vulpes*), feral pigs (*Sus scrofa*), feral/domestic cats *(Felis domestica*), and dogs (*Canis familiaris*) are introduced. These situations become particularly acute where urban development immediately abuts Alameda whipsnake habitat. The EBRPD is currently facing increasing public pressure to allow private individuals to maintain feral cats on park lands. Although the actual impact of predation under such situations is not known, feral cats are known to prey on reptiles including yellow racers which are also fast moving, diurnal snakes. In general, Alameda whipsnakes will decline in areas that lie adjacent to urban development due to loss of cover habitats in combination with increased native and non-native predators using these areas.

Grazing may have impacted the habitat of the Alameda whipsnake in many areas. Livestock grazing that significantly reduces or eliminates shrub and grass cover can be detrimental to this snake by reducing cover from predators, and possibly reducing prey populations as well. As with many snake species, Alameda whipsnakes avoid such denuded, open areas.

The breeding of closely related individuals can cause genetic problems in small populations, particularly through the expression of deleterious genes (known as inbreeding depression). Individuals and populations possessing deleterious genetic material are less able to adapt to changes in environmental conditions, even relatively minor changes. Further, small populations are vulnerable to the effects of genetic drift (the loss of genetic variability). This phenomenon also reduces the ability of individuals and populations to successfully respond to environmental

stresses. Overall, these factors influence the survivability of smaller, genetically isolated populations of the Alameda whipsnake (62 **FR** 64306).

All five Alameda whipsnake populations are essential to the survival and recovery of the species. Further fragmentation or reduction of any of the five populations will undoubtably affect the ability of the population(s) to rebound from natural or human-made events. This is because (1) small, isolated populations are vulnerable to extinction from random fluctuations in population size due to catastrophic events such as fire or variations in population characteristics (*e.g.*, sex ratios) caused by annual weather patterns, food availability, and other factors; and (2) further reductions will likely result in adverse genetic consequences because many of the populations of Alameda whipsnakes are isolated from other conspecific populations and natural recolonization from other populations is unlikely or impossible.

Alameda whipsnake critical habitat

Critical habitat for the Alameda whipsnake was designated on October 3, 2000 (65 FR 58933). Unit 5 of the critical habitat, the Sunol-Cedar Mountain unit, covers part of northern Santa Clara County, from east of Interstate 680, encompassing the area around Calaveras Reservoir and extending to Wauhab/Valpe Ridges. Included within the designated area is primary breeding, feeding, and sheltering habitat for the species. The primary constituent elements of critical habitat for the whipsnake include areas that support scrub communities such as mixed chaparral, chamise-redshank chaparral, and coastal scrub and annual grassland and various oak woodlands that lie adjacent to scrub habitats. In addition, the primary constituent elements may be found in grasslands and oak woodlands that are linked to scrub by substantial rock outcrops or riparian corridors. Other habitat features that provide a source of cover for the whipsnake during dispersal or lie in reasonable proximity to scrub habitats and contain habitat features (e.g., rock outcrops) that support adequate prey populations may also contain primary constituent elements for the Alameda whipsnake.

Bay Checkerspot Butterfly

The bay checkerspot was listed as threatened on September 18, 1987 (52 **FR** 35366). A detailed account of the taxonomy, ecology, and biology of the species is presented in the *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area* (USFWS 1998). The bay checkerspot is a medium-sized butterfly with a wing span of about 5 cm (2 in.). The forewings have black bands along all veins on upper wing surface, contrasting sharply with bright red, yellow and white spots.

The bay checkerspot formerly occurred around San Francisco Bay, from Twin Peaks and San Bruno Mountain (west of the Bay) and Contra Costa County (east of the Bay) south through

Santa Clara County. The range of the bay checkerspot is now reduced to patchy distribution in Santa Clara and San Mateo counties. All areas now or recently inhabited by the bay checkerspot are island-like patches of suitable habitat isolated by intervening unsuitable habitat and urban development. The exact distribution of the butterfly varies through time: sites that are unoccupied one year may be occupied the next, and vice versa. The butterfly currently occupies less than 12,000 acres (5,000 ha). Most individuals of the species live only a single year, with high fecundity, high mortality, and sensitivity to weather and other ecological conditions. Large population swings are common; fluctuations of more than 100-fold have been observed. These fluctuations are not always in synchrony among populations at different sites.

Habitat of the bay checkerspot exists on shallow, serpentine-derived or similarly drought and/or infertile soils, which support the butterfly's larval food plants, as well as nectar sources for adults. The primary larval host plant is dwarf plantain (*Plantago erecta*), a native annual. In many years, bay checkerspot larvae (caterpillars) may use a secondary host plant species; for example, when dwarf plantain dries up while pre-diapause larvae are still feeding. Purple owl's-clover (*Castilleja [Orthocarpus] densiflora*) and exserted paintbrush (*Castilleja exserta [Orthocarpus purpurascens]*) are known secondary host plants. Nectar plants for adults commonly visited include desert parsley (*Lomatium* spp.), California goldfields (*Lasthenia californica [=chrysostoma]*), tidy-tips (*Layia platyglossa*), and common muilla (*Muilla maritima*).

The bay checkerspot's life cycle is tied to host plant biology. Host plants germinate from early October to late December and senesce (dry up and die) from early April to mid May. Most of the active parts of the bay checkerspot life cycle occur during this time. Adults emerge from pupae in early spring, feed on nectar, and mate and lay eggs during a flight season that typically lasts for 4 to 6 weeks late February to early May. Eggs hatch, and tiny pre-diapause larvae feed for about 2 to 3 weeks and before entering diapause (a period of dormancy, spent under rocks and deep in soil cracks) in mid to late spring. Post-diapause larvae emerge after winter rains, stimulated by germination of dwarf plantain, and feed and bask until they are large enough to pupate and emerge as adults.

Studies of bay checkerspot have described its distribution as an example of a metapopulation. A metapopulation is a group of spatially separated populations that can occasionally exchange dispersing individuals. The populations in a metapopulation typically undergo interdependent extinction and colonization, where individual populations may go extinct and later be recolonized from another population. Bay checkerspot populations may also exhibit "pseudo-extinction," where the species is not found but nonetheless continues to inhabit a site and re-appears in a subsequent year. Larvae that diapause for more than one year may be responsible for pseudo-extinctions, since diapausing larvae are essentially undetectable in practical surveys. Because of pseudo-extinction and metapopulation dynamics, even sites that in some years

apparently lack the bay checkerspot can be important to species survival and recovery.

The species' Recovery Plan identifies five known core areas of habitat, four of which occur in Santa Clara County. The Service considers these four core areas to provide a population reservoir critical to the survival of the Santa Clara County meta-population. Core areas are moderate to large areas of suitable habitat that support persistent bay checkerspot populations. The pattern of occupancy by the bay checkerspot suggests that core populations provide migrants to colonize unoccupied habitat. The Santa Clara County core areas all flank the Coyote Valley, the portion of the Santa Clara Valley between the cities of San Jose and Morgan Hill. The core areas are mostly in private ownership, and are largely used as grazing land. The Santa Teresa Hills, adjacent to the Coyote Valley to the west, are considered a potential core area because of extensive suitable soils and proximity to other core areas, but are in poor condition in many areas because of lack of management of non-native vegetation. The core and potential core areas and nearby and connecting habitats have been designated as critical habitat for the bay checkerspot.

Bay checkerspot critical habitat

Critical habitat of the bay checkerspot was designated on April 30, 2001 (66 FR 21450), and became effective on May 30, 2001. A total of 9,673 acres (3918 ha) of critical habitat was designated, 8,867 acres (3591 ha) of this in Santa Clara County. The primary constituent elements of bay checkerspot critical habitat are those habitat components that are essential for the primary biological needs of foraging, sheltering, breeding, maturation, and dispersal. The primary constituent elements are one or more of the following: stands of *Plantago erecta*, *Castilleja exserta*, or *Castilleja densiflora*; spring flowers providing nectar; pollinators of the bay checkerspot's food and nectar plants; soils derived from serpentine rock; and space for dispersal between habitable areas. In addition, the following are each primary constituent elements to be conserved when present in combination with one or more of the primary constituent elements above: areas of open grassland, topography with varied slopes and aspects providing surface conditions with warm and moderate to cool temperatures during sunny spring days, stable holes or cracks in the soil and surface rocks or rock outcrops, wetlands providing moisture during times of spring drought.

California Clapper Rail

The clapper rail was federally listed as endangered in 1970 (35 **FR** 16047). A detailed account of the taxonomy, ecology, and biology of the clapper rail is presented in the Recovery Plan and the references cited therein (USFWS 1984).

The clapper rail is endemic to tidally influenced salt and brackish marshes of California. Historically, the clapper rail occurred in tidal marshes along California's coast from Morro Bay,

San Luis Obispo County, to Humboldt Bay, Humboldt County. Currently, clapper rails are known to occur in tidal marshes in San Francisco, San Pablo, Grizzly, Suisun and Honker Bays.

The clapper rail is distinguishable from other rails by its large body size of 32-47 cm (12.5-18.3 inches) from bill to tail, and weighs approximately 250-350 g (8.75-12.25 oz). It has a long, slightly decurved orange bill, a rufous breast, black and white barred flanks, and white undertail coverts. Clapper rails are sexually dimorphic, the males are slightly larger than females. Juveniles have a pale bill and dark plumage.

Clapper rails are typically found in the intertidal zone and sloughs of salt and brackish marshes dominated by pickleweed, Pacific cordgrass (*Spartina foliosa*), gumplant (*Grindelia spp.*), salt grass, jaumea (*Jaumea carnosa*) and adjacent upland refugia. They may also occupy habitats with other vegetative components, which include, but are not limited to bulrush *(Scirpus americanus* and *S. maritimus*), cattails (*Typha spp.*), and Baltic rush (*Juncus balticus*).

Clapper rails are capable of producing several vocalizations, most common of which is a series of keks or claps. Pair bonds are typically established during the month of February, and nesting typically occurs from March through August. Estimates of California clapper rail clutch size range from 5-14 eggs. The clapper rail builds a bowl shaped platform nest of marsh vegetation and detritus. The clapper rail typically feeds on benthic invertebrates, but its diet is wide ranging, and includes seeds, and occasionally small mammals such as the harvest mouse.

Suitable habitat has been significantly reduced by approximately 84 percent of historic in the San Francisco Bay Area due to habitat conversions for urban and agricultural uses, and is a primary factor in the species decline. Additional impacts which have contributed to the decline in clapper rail populations include over-harvesting, environmental contaminants, and erosion or subsidence of habitat.

California Red-Legged Frog

The red-legged frog was federally listed as threatened on May 23, 1996 (61 **FR** 25813), effective June 24, 1996. A detailed account of the taxonomy, ecology, and biology of the red-legged frog is presented in the *Draft Recovery Plan for the California Red-legged Frog (Rana aurora draytonii)* (USFWS 2000). This species is the largest native frog in the western United States, ranging from 4 to 13 centimeters (cm) (1.5 to 5.1 inches [in.]). The abdomen and hind legs of adults are largely red; the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have light centers, and dorsolateral folds are prominent on the back. Larvae (tadpoles) range from 14 to 80 millimeters (mm) (0.6 to 3.1 in.) in length, and the background color of the body is dark brown and yellow with darker spots.

Female frogs deposit egg masses on emergent vegetation so the egg mass floats on the surface of the water. Red-legged frogs breed from November through March with earlier breeding records occurring in southern localities. Individuals occurring in coastal drainages are active year-round, whereas those found in interior sites are normally less active during the cold season.

Breeding sites have been documented in a variety of aquatic habitats. Larvae, juveniles and adult frogs have been observed inhabiting streams, creeks, ponds, marshes, sag ponds, deep pools and backwaters within streams and creeks, dune ponds, lagoons, estuaries, and artificial impoundments such as stock ponds. Furthermore, breeding has been documented in these habitat types irrespective of vegetative cover. Frogs often breed in artificial ponds with little or no emergent vegetation and have been observed to breed in and inhabit stream reaches that are not cloaked in riparian vegetation. The importance of riparian vegetation for this species is not well understood. It is believed the moisture and camouflage provided by the riparian plant community may provide good foraging habitat and may facilitate dispersal in addition to providing pools and backwater aquatic areas for breeding. However, other factors are more likely to influence the suitability of aquatic breeding sites, such as a general lack of introduced aquatic predators. Red-legged frogs often disperse from their breeding habitat to utilize various aquatic, riparian, and upland habitats as summer habitat. However, red-legged frogs also have been found in ephemeral creeks and drainages and in ponds that may or may not have riparian vegetation. When riparian habitat is present, frogs spend considerable time resting and feeding in the vegetation. When riparian habitat is absent, frogs spend considerable time resting and feeding under rocks and ledges both in and out of water. Red-legged frogs also use small mammal burrows and moist leaf litter and incised stream channels with portions narrower and deeper than 18 in. also providing habitat (USFWS 2000).

Red-legged frogs disperse upstream and downstream of their breeding habitat to forage and seek shelter. Sheltering habitat for red-legged frogs potentially includes all aquatic, riparian, and upland areas within the range of the species and any landscape features that provide cover, such as existing animal burrows, boulders or rocks, organic debris such as downed trees or logs, and industrial debris. Agricultural features such as drains, watering troughs, spring boxes, abandoned sheds, or hay ricks may also be used. Accessability to sheltering habitat is essential for the survival of red-legged frogs within a watershed and can be a factor limiting population numbers and survival. During winter rain events, juvenile and adult red-legged frogs are known to disperse up to 1-2 km (0.6-1.25 miles) (66 FR 14628-9).

Red-legged frogs are often prolific breeders, laying their eggs during or shortly after large rainfall events in late winter and early spring. Eggs hatch in 6 to 14 days. Siltation during the breeding season can cause asphyxiation of eggs and small larvae. Larvae undergo metamorphosis 3.5 to 7 months after hatching. Of the various life stages, larvae probably experience the highest mortality rates, with less than 1 percent of eggs laid reaching metamorphosis. Sexual maturity

normally is reached at 3 to 4 years of age. Red-legged frogs may live 8 to 10 years.

The diet of red-legged frogs is highly variable. Invertebrates are often the most common food items, although vertebrates, such as Pacific tree frogs (*Hyla regilla*) and California mice (*Peromyscus californicus*), may represent over half the prey mass eaten by larger frogs. Juvenile frogs are active diurnally and nocturnally, whereas adult frogs are largely nocturnal. Feeding activity probably occurs in both terrestrial and aquatic settings. Larvae likely eat algae.

Several researchers in central California have noted the decline and eventual disappearance of red-legged frog populations once bullfrogs became established at the same site. This has been attributed to both predation and competition. Twedt (1993) documented bullfrog predation of juvenile northern red-legged frogs and suggested that bullfrogs could prey on subadult red-legged frogs as well. In addition to predation, bullfrogs may have a competitive advantage over red-legged frogs: bullfrogs are larger, possess more generalized food habits, possess an extended breeding season where a female can produce as many as 20,000 eggs, and are unpalatable to predatory fish as larvae. In addition to competition, bullfrogs interfere with red-legged frog reproduction. Both California and northern red-legged frogs have been observed in amplexus with (mounted on) both male and female bullfrogs (USFWS 2000).

The historic range of the California red-legged frog extended along the coast from the vicinity of Point Reyes National Seashore, Marin County, California, and inland from the vicinity of Redding, Shasta County, California, southward to northwestern Baja California, Mexico. California red-legged frogs have been documented in 46 counties in California, but now remain in only 238 streams or drainages in 31 counties (61 FR 25813). California red-legged frogs are still locally abundant within portions of the San Francisco Bay area and the central coast. Within the remaining distribution of the species, only isolated populations have been documented in the Sierra Nevada, northern Coast, and northern Transverse ranges. The species is believed to be extirpated from the southern Transverse and Peninsular ranges, but is still present in Baja California, Mexico.

The California red-legged frog has sustained a 70 percent reduction in its geographical range in California as a result of several factors acting singly or in combination. Habitat loss and alteration, combined with over exploitation and introduction of exotic predators, were significant factors in the California red-legged frogs' decline in the early to mid-1900s. The California red-legged frog is threatened within its remaining range by a wide variety of human impacts, including urban encroachment, construction of reservoirs and water diversions, land conversions, industrial and non-industrial forest practices, introduction of exotic predators and competitors, livestock grazing, and habitat fragmentation (USFWS 2000). California red-legged frogs population numbers are not precisely known, although the Service estimates that many California red-legged frog populations are declining throughout the range of the subspecies.

California Red-Legged Frog Critical Habitat

Critical habitat for the California red-legged frog was designated on March 13, 2001 (66 FR 14626). Due to the complex life history and dispersal capabilities of the California red-legged frog, and the dynamic nature of the environment in which they are found, the primary constituent elements of critical habitat for the frog may be found throughout the watersheds–including uplands–that are designated as critical habitat. Habitat rehabilitation efforts (*e.g.* removal of non-native predators) may be necessary in some areas, as well as changes in current management activities, to attain optimal distribution of California red-legged frogs within each critical habitat unit. The primary constituent elements of critical habitat for California red-legged frogs are (a) Suitable aquatic habitat; (b) associated uplands; and (c) suitable dispersal habitat connecting suitable aquatic habitat. Critical habitat for California red-legged frogs will provide for breeding and nonbreeding habitat and for dispersal between these habitats, as well as allowing for expansion of California red-legged frog populations, which is vital for the recovery of the species.

Suitable aquatic habitat is essential for providing space, food, and cover needed to sustain eggs, tadpoles, metamorphosing juveniles, nonbreeding subadults, and breeding and nonbreeding adult frogs. Suitable aquatic habitat for California red-legged frogs consists of virtually all still or slow moving fresh water bodies, including natural and manmade ponds, backwaters within streams and creeks, marshes, lagoons, and dune ponds, except deep lacustrine water habitat (e.g. deep lakes and reservoirs) inhabited by nonnative predators. The species requires a permanent water source to ensure that water is available year-round. Permanent water sources can include, but are not limited to, ponds, perennial creeks (or permanent plunge pools within intermittent creeks), seeps and springs. Aquatic habitat used for breeding must have a minimum deep water depth of 20.32 cm (8 in) and maintain water during the entire tadpole rearing season (at least March through July). During periods of drought or less than average rainfall, these breeding sites may not hold water long enough for individuals to complete metamorphosis, but these sites would still be considered suitable breeding habitat. To be considered a critical habitat, the aquatic component must consist of two or more breeding sites located within 2 km (1.25 mi) of each other, if at least one of the sites is also a permanent water source, or two or more breeding sites and a permanent water source located within 2 km (1.25 mi), if the breeding sites are not permanent water sources. In addition, the sites must be connected by suitable dispersal habitat.

Associated uplands are essential to maintain the integrity of California red-legged frog aquatic habitat, by providing the conditions essential for providing food, water, nutrients, and protection from disturbances necessary for normal behavior, and provide shelter to frogs inhabiting upland areas adjacent to suitable aquatic habitat. Key conditions include the timing, duration, and extent of water moving within the system, filtering capacity, and maintaining the habitat to favor California red-legged frogs and discourage the colonization of exotic species such as bullfrogs.

Suitable upland habitat consists of all upland areas within 152.4 m (500 ft), or no further than the watershed boundary, of the edge of suitable aquatic habitat.

Suitable dispersal habitat provides connectivity among California red-legged frog aquatic habitat (and associated upland) patches. While frogs can pass many obstacles, and do not require a particular type of habitat for dispersal, the habitat connecting suitable breeding locations and other aquatic habitat must be free of barriers and at least 152.4 m (500 ft) wide. Suitable dispersal habitat consists of all upland and wetland habitat free of barriers that connect two or more patches of suitable aquatic habitat within 2 km (1.25 mi) of one another. Dispersal barriers include heavily traveled roads (with more than 30 cars per hour), moderate to high density urban or industrial developments, and large reservoirs. Areas where barriers to dispersal occur would not be considered critical habitat. Agricultural lands such as row crops, orchards, vineyards, and pastures do not constitute barriers to California red-legged frog dispersal.

In summary, the primary constituent elements consist of three components. At a minimum, this will include two (or more) suitable breeding locations, a permanent water source, associated uplands surrounding these water bodies up to 152.4 m (500 ft) from the waters edge, all within 2 km (1.25 mi) of one another and connected by barrier free dispersal habitat that is at least 152.4 m (500 ft) in width. When these elements are all present, all other suitable aquatic habitat within 2 km (1.25 mi), and free of dispersal barriers, is also considered critical habitat.

Unit 15 consists of tributaries of San Lorenzo Creek, Alameda Creek, Kellog Creek, Orestimba Creek, Coyote Creek, Pacheco Creek, Romero Creek, Ortigalita Creek, Los Banos Creek, Panoche Creek, and the San Benito River in Contra Costa, Alameda, San Joaquin, Santa Clara, Stanislaus, San Benito, Merced, and Fresno Counties. The unit encompasses approximately 4,569,265.4 km^2 (1,129,050 ac), of which 86 percent is privately owned. Much of these privately owned lands have been degraded by grazing and other agricultural activities.

Coyote Ceanothus

The Coyote ceanothus was federally listed as endangered in 1995 (60 **FR** 6671, Service 1995). A detailed account of the taxonomy, ecology, and biology of the species is presented in the *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area* (USFWS 1998). Coyote ceanothus is an erect evergreen shrub of the buckthorn family (Rhamnaceae) that grows 1 to 2 m (3 to 6 feet) high. The ceanothus grows on dry slopes in serpentine chaparral and valley and foothill grassland.

Coyote ceanothus is known from only three locations: Anderson Dam, Kirby Canyon and Llagas Avenue north of Morgan Hill. Prior to 1993, all of the populations were composed of mature and senescent individuals (large plants with many dead branches). The population in Kirby

Canyon, the smallest of the three, burned during the summer of 1992. The following spring approximately 2,000 seedlings were observed (USFWS 1998). These seedlings were fenced to protect them from grazing until the plants were established, and 100 plants were individually caged. One year later survivorship of the caged seedlings was good.

Kathy Freas, another *Ceanothus* expert, conducted germination trials using various heat and disturbance treatments (*in litt*., 1993). Her results suggest that Coyote ceanothus seeds do not require fire for germination. If the seeds do not require fire for germination, the lack of recruitment in natural populations may be due to seed or seedling mortality (Center for Conservation Biology 1990, K. Freas, *in litt*., 1993). Possible sources of mortality include seed predation, grazing/browsing, lack of sufficient precipitation to maintain young plants through the summer following germination, or some combination of these (K. Freas, *in litt*., 1993). Despite the results of the germination trials, the only seedlings observed in nature were following a fire in Kirby Canyon (USFWS 1998). Coyote ceanothus is relatively easy to propagate from seed (Center for Conservation Biology 1990, K. Freas, *in litt*., 1993) and from tip cuttings.

Metcalf Canyon Jewelflower

The jewelflower was federally listed as endangered in 1995 (60 **FR** 6671). A detailed account of the taxonomy, ecology, and biology of the species is presented in the *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area* (USFWS 1998). The jewelflower is an annual herb of the mustard family (Brassicaceae) that reaches 1 m (3 ft.) or more in height.

The jewelflower flowers from April to June. No detailed data on its reproductive biology or demography are available. Nine populations totaling approximately 20,000 to 25,000 plants have been recorded, all in Santa Clara Valley area (USFWS 1998). The jewelflower is endemic to serpentine outcrops with little soil development within a matrix of serpentine grassland. The species also occurs on roadcuts through serpentine substrate. The jewelflower grows in areas with other rare species including the bay checkerspot and other plants native to serpentine soils in Santa Clara County.

Salt Marsh Harvest Mouse

The harvest mouse was federally listed as endangered in 1970 (35 **FR** 16047). A detailed account of the taxonomy, ecology, and biology of the harvest mouse is presented in the *Salt Marsh Harvest Mouse & California Clapper Rail Recovery Plan* (USFWS 1984) and the references cited therein.

The harvest mouse is a rodent endemic to the salt and brackish marshes of the San Francisco Bay Area and adjacent tidally influenced areas. The harvest mouse closely resembles the western

harvest mouse (*R. megalotis*). The harvest mouse typically weighs about 10 grams (3.5 oz), has a head and body length ranging from 69-74 mm (2.7-2.9 in), a tail length ranging from 65-82 mm (2.5-3.2 in), and a hind foot length of 17-18 mm (0.66-0.7 in). As stated in the recovery plan, the harvest mouse, when compared to the western harvest mouse, have darker ears, belly and back, and a slightly thicker, less pointed and unicolored tail. The harvest mouse is further distinguished taxonomically into the northern and southern subspecies, *R. raviventris halicoetes* and *R. raviventris raviventris*, respectively. Of the two subspecies, *R. r. halicoetes* more closely resembles *R. megalotis*, and can be difficult to differentiate in the field; body color and color of ventral hairs as well as the thickness and shape of the tail have been used to distinguish the two.

The harvest mouse has evolved to a life in tidal marshes. Specifically, they have evolved to depend mainly on dense pickleweed (*Salicornia virginica*) as their primary cover and food source. However, harvest mice may utilize a broader source of food and cover which includes salt grass (*Distichlis spicata*) and other vegetation typically found in the salt and brackish marshes of this region. In natural systems, harvest mice can be found in the middle tidal marsh and upland transition zones. Upland refugia is an essential habitat component during high tide events. Harvest mice are highly dependent on cover, and open areas as small as 10 meters (32.8 ft) wide may act as barriers to movement (USFWS 1984). The harvest mouse does not burrow. It has been noted that the northern subspecies may build nests of loose grasses.

Male harvest mice are reproductively active from April through September, but may appear active throughout the year. Females are reproductively active from March to November, and have a mean litter size of approximately four offspring.

The historic range of the species included tidal marshes within the San Francisco and San Pablo Bay areas, east to the Collinsville-Antioch areas. It has been estimated that of the 193,800 acres (78,489 ha) of tidal marsh that existed in 1850, about 30,100 acres (12,555 ha) currently remain (Dedrick 1993). Based on this estimate, there has been an 84 percent reduction in tidal wetlands in the Bay Area. Since 1850, agriculture and urbanization has claimed much of the former tidal marshes. At present, the distribution of the northern subspecies occurs along Suisun and San Pablo Bays north of Point Pinole in Contra Costa County and Point Pedro in Marin County. The southern subspecies is found in marshes in Corte Madera, Richmond, and South San Francisco Bay mostly south of the San Mateo Bridge (Highway 92).

Santa Clara Valley Dudleya

The dudleya was federally listed as endangered in 1995 (60 **FR** 6671). A detailed account of the taxonomy, ecology, and biology of the species is presented in the *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area* (USFWS 1998). The dudleya is a low-growing

perennial of the stonecrop family (Crassulaceae) with fleshy, glabrous (hairless) leaves. The roots of *Dudleya setchellii* are at least 15 cm (6 in.) long and often extend into rock crevices of the serpentine outcrops. The rock outcrops themselves have little vegetative cover.

The dudleya produces wind-dispersed seeds, and also reproduces vegetatively by forming rosettes that can separate from the parent plant. Individual plants may live for approximately 10 years. Few detailed data on the reproductive biology or demography of the species are available. However, McCarten has studied demography of the dudleya at Kirby Canyon Landfill. He found seedling germination was high in wet years, but seedling survivorship was often very low in both natural and created habitats. Seedling survival was generally less than 5 percent and may be less than 1 percent after the first year. The primary cause of low survival may be the limited number of rock crevices with soil to provide the necessary nutrient and moisture conditions (USFWS 1998).

The dudleya is found only in rocky serpentine grasslands in the Coyote Valley area, from San Jose south to San Martin in Santa Clara County. A recent survey for the species in Santa Clara County found up to 15 new occurrences and reported seven previously less-documented occurrences from the same general area, together comprising nearly 20,000 individual plants, but did not substantially expand the geographic range of the species (Harvey & Assoc. 2000). This survey brings the number of dudleya occurrences thought to be extant to 50, and the maximum known number of individuals to about 86,000.

Tiburon paintbrush

The paintbrush was federally listed as endangered in 1995 (60 **FR** 6671). A detailed account of the taxonomy, ecology, and biology of the species is presented in the *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area* (USFWS 1998). The paintbrush is a semi-woody perennial of the snapdragon family (Scrophulariaceae). The paintbrush is a root parasite on other flowering plant species. The primary advantage of the parasitic attachment in *Castilleja* and related plants is reportedly an increased water and nutrient supply. Though the parasitic relationship is not obligate (hemiparasitic), benefits to species of *Castilleja* from the parasitic habit are manifested in increased vigor with more branching, greater height, and earlier flowering (USFWS 1998).

Tiburon paintbrush has never been widespread. Six of the eight populations occur north of the San Francisco Bay, in Marin and Napa counties. Two populations occur in close proximity on Coyote Ridge in Santa Clara County. Populations are small, ranging from less than 100 plants at the Kirby Canyon (Santa Clara County) site (CNDDB 1996, D. Mayall in litt. 2001) to approximately 600 plants at Ring Mountain Preserve on the Tiburon Peninsula.

The paintbrush occurs in serpentine grassland. It flowers from April to June. Reproductive biology is not well known, although the species may be pollinated by bees, moths, butterflies, or hummingbirds (L. Heckard, *in litt*., 1989, M. Wetherwax, pers. comm. June 2001, N. McCarten pers. comm. July 2001)). Seeds are shed in June and July, and the species dies back to its woody base in July and August. New growth from the woody base begins in December or January. Seeds may remain dormant in the soil for several years. Seed germination occurs in January or February and seems to be induced by leaching and low temperatures.

Environmental Baseline and Status of the Species in the Action Area

Please refer to the 2000 Interim biological opinion for a discussion of baseline conditions for most species. This section provides important updates as well as baseline information for species added in the current consultation.

Unlike most other interim water contractors, Santa Clara Valley WD's service area is very broadly defined, to include all of Santa Clara County. Santa Clara Valley WD uses groundwater recharge and subsequent withdrawal extensively as a water management technique. CVP water delivered to Santa Clara Valley WD is likely to be commingled with their underground supply and become indistinguishable from other Santa Clara Valley WD supplies. In Santa Clara Valley WD's arrangement with Pajaro Valley WMA and Westlands WD, deliveries of the assigned water to Santa Clara Valley WD are likely to be greater in drier years, which also represent the limiting factor in Santa Clara Valley WD being able to meet service area demand. Thus CVP deliveries to Santa Clara Valley WD potentially affect water supply throughout the county, and are likely to elevate the base supply available in drier years. Therefore, in this Baseline and status in the action area section, we have treated all of Santa Clara County as part of the action area.

In recent years, Santa Clara County has been one of the most rapidly growing and developing counties in California and the nation. In FY2000 and 2001, thirteen formal and 53 informal consultations were initiated with the Service for projects in Santa Clara County, as well as over 500 requests from the County, City of San Jose, and other non-Federal parties for technical assistance from the Service regarding particular projects and endangered species. These projects have had impacts on nearly all the Santa Clara County species in this consultation.

Alameda Whipsnake Baseline

The Alameda whipsnake occurs within the action area in northern Santa Clara County, the service area of the Santa Clara Valley Water District. Much of the area is undeveloped and used for rangeland, as public water supply watershed, or as parkland. Some urban and suburban development occurs along Calaveras Boulevard, Weller Road, and Felter Road.

Alameda Whipsnake Critical Habitat Baseline

The Service is not aware of any projects that have altered the Alameda whipsnake critical habitat baseline in northern Santa Clara County since the date of critical habitat designation. In the rest of the Sunol-Cedar Mountain unit, the Double Wood golf course in Fremont (file 1-1-00-F-219)

affected 169 acres (68 hectares) of grasslands and riparian corridor within the critical habitat unit boundary, some of this temporarily. The adjacent Avalon residential development landslide repair and bank stabilization impacted about 9 acres of critical habitat, mostly temporarily (file 1-1-00-F-230). Both Double Wood and Avalon are on the western boundary of the unit, in southern Alameda County near Interstate 680.

Bay Checkerspot Butterfly Baseline

The bay checkerspot butterfly (bay checkerspot) occurs within the action area on serpentinic soils in Santa Clara County. Primary reasons for the decline of the bay checkerspot are habitat degradation and loss, caused by non-native plants displacing or reducing native food plants, and by urban and suburban development. The extirpation of several populations has been well documented (Murphy and Weiss 1988). Direct strikes and turbulence due to vehicles driving on public roads also cause an unknown amount of mortality and injury to bay checkerspot annually.

The spring of 2001 was favorable for bay checkerspot numbers in parts of the San Jose area. Large numbers of butterflies were observed at Tulare Hill, Coyote Ridge above Kirby Canyon, and other sites. Weather to date also appears favorable to the species in 2002. In other favorable trends, private and public concerns have acquired title, conservation easement, or lease of nearly 1000 acres of bay checkerspot habitat for the benefit of the species, much of it designated critical habitat in the Silver Creek, Kirby, and Tulare Hill Corridor units.

On the other hand, the only remaining San Mateo County population of the butterfly is at critically low levels, with only two to three adults observed at Edgewood Park in 2001. The Jasper Ridge population in San Mateo County is likely to be extirpated. The Silver Creek Hills population, in south San Jose in Santa Clara County, remains very low, with only 7 butterflies observed in sampling in 2001 (R. White, pers. comm. Jun. 2001). The potential core area of the Santa Teresa Hills, a Santa Clara County park, remains in relatively poor condition over substantial areas due to lack of suitable vegetation management, and supports low densities of the species relative to its potential.

Invasion of native grasslands by non-native species is widely seen as one of the major causes of bay checkerspot decline. Serpentine habitats, although more resistant than most, are not completely immune to invasion by non-natives, so non-native invasive plants present a continuing threat. For example, non-native grass growth in the Silver Creek core recovery area has been observed to choke out dwarf plantain (USFWS 1998). The negative impact of invasive plants on serpentine habitats is increased by fertilization (possibly including deposition of nitrogen, a plant nutrient, from air pollution), watering or irrigation, and frequency of introduction of seeds or other propagules (Huenneke *et al.* 1990, Thomas Reid Associates and Murphy 1992, 1995, Weiss 1999). Weiss (1996, 1999) has presented evidence that some bay checkerspot habitats are more prone to non-native grass invasion because of nitrogen deposition

from air pollution.

By promoting the invasion and growth of non-native plants in serpentine soils where they compete with larval host plants and adult nectar plants, nutrient deposition from air pollution may seriously reduce the quality of many bay checkerspot habitats. Nitrogen compounds are deposited on soils and vegetation from the air in both wet (during rainfall) and dry conditions. Nitrogen tends to be tightly recycled by the plants and microbes in infertile soils like those derived from serpentines, so fertilization impacts could persist there for years and may be accumulating now. Air pollution is common around all major remaining bay checkerspot populations, in Santa Clara County, so nitrogen deposition is a serious threat that could reduce the likelihood of bay checkerspot recovery (Weiss in litt. 2000).

Automobile traffic and industry are major sources of emissions of nitrogen compounds (both NO_x and ammonia) to the air. Weiss (1999) estimated excess nitrogen deposition rates from air pollution in the area of Santa Clara Valley bay checkerspot habitats at 10 to 15 kg nitrogen per hectare per year. He concluded that these deposition rates are sufficient to affect ecosystem structure and diversity, and that the invasion of serpentine soils by non-native plants and decline of bay checkerspot populations in the area are related to air pollution. Further incremental increases in nitrogen deposition to an already stressed ecosystem will affect the habitat further. A more detailed analysis of air pollution impacts on bay checkerspot is presented in the Service's biological opinions on the Metcalf Energy Center (file 1-1-00-F-235) and U.S. Highway 101 widening and Coyote Valley Research Park development (1-1-00-F-0123).

Throughout the range of the species and in Santa Clara County in general, the status of the bay checkerspot remains tenuous because of the limited number and extent of populations and their sensitivity to environmental conditions. Important habitat areas and actions for survival and recovery of the species are identified in the recovery plan (USFWS 1998).

Bay Checkerspot Critical Habitat Baseline

The majority of bay checkerspot critical habitat, 12 of 15 units, occurs in Santa Clara County in proximity to expanding urban development. More than 80 percent is on private lands.

Since designation of critical habitat for the bay checkerspot, we are aware of two projects that plan to affect it in Santa Clara County. One is the Ranch on Silver Creek project in the Silver Creek critical habitat unit. Construction of a road and golf course features has resulted in less than one acre of permanent and about six acres of temporary impacts. The temporarily impacted areas will be restored to native ecosystem, and a total of more than 500 acres–much of it critical habitat, both on and off-site–has been preserved and will be managed in perpetuity to benefit the butterfly and other native species. The second project is a KB Homes development within the Communications Hill critical habitat unit. More than 100 acres would be eliminated by this

project.

California Clapper Rail Baseline

In San Francisco Bay, clapper rails are known to occur primarily from Crescent Marsh south through Alviso, and north to the seaplane terminal near San Francisco International Airport. Within the action area, clapper rails occur in salt marsh habitats along the south Bay in northern Santa Clara County. An updated Recovery Plan for the clapper rail is in development, and may refine recovery objectives. Clapper rails are known to occur along outboard levees of the salt evaporation ponds and vegetated sloughs.

As described previously, habitat loss and/or degradation is the primary cause of decline for the clapper rail throughout its range. In south San Francisco Bay, management and maintenance activities associated with salt production and wastewater discharge may be impairing recovery of the clapper rail. Other factors which continue to contribute to the decline of clapper rails include environmental contaminants, predation, and conversion of salt marsh habitat by freshwater sewage treatment discharges. The Service collected data in 1991 and 1992 regarding mercury concentrations in clapper rail eggs in south San Francisco Bay. The data indicated that mercury contamination in clapper rail eggs occurs at potentially harmful levels. The percentage of non-viable eggs in this study ranged from 24-38 percent. Predator management is essential in the recovery of clapper rails. Predators of the clapper rail include, but are not limited to striped skunks (*Mephitis mephitis*), rats (*Rattus norvegicus*), red fox (*Vulpes vulpes*), and feral cats (*Felis catus*).

Salt marsh habitat of clapper rails in the south Bay has been degraded by large and unseasonal discharges of fresh water from sewage treatment facilities in the south Bay area, such as San Jose in Santa Clara County. Salt marsh vegetation required by the clapper rail in turn requires salty conditions. Conversion to fresh conditions has promoted invasion of non-habitat vegetation and harmed the clapper rail. Without major changes in sewage treatment technology, sewage discharges are a direct function of human population and water use: increasing population and sewage load have lead to increasing freshwater effluent discharges in the south Bay.

Other impacts to clapper rails in south San Francisco Bay have included disturbance and habitat alteration from maintenance of levees, increased sedimentation of habitat as a result of upland development and erosion, and habitat alteration by invasion of non-native vegetation.

California Red-legged Frog Baseline

Red-legged frogs have been extirpated or nearly extirpated from more than 70 percent of their historic range. Historically, this species was found throughout the Central Valley and Sierra Nevada foothills. As of 1996, red-legged frogs were known to occur in approximately 240

streams or drainages from 23 counties, primarily in central coastal California. Monterey, San Luis Obispo, and Santa Barbara counties support the largest extent of currently occupied habitat. Habitat loss, non-native species introduction, and urban encroachment are the primary factors that have adversely affected the red-legged frog throughout its range.

In December 2000, scientists of the U.S. Geological Survey and U.S. Department of Agriculture announced results of a study indicating that organophosphorus pesticides from agricultural areas on the San Joaquin Valley floor, which are transported to the Sierra Nevada on prevailing summer winds, may be affecting populations of amphibians that breed in mountain ponds and streams. These include several amphibian species of concern–the foothills yellow-legged frog, the mountain yellow-legged frog and the Yosemite toad–as well as the California red-legged frog. These species have experienced population declines in California over the last 10 to15 years.

The addition of Santa Clara County–the service area of the Santa Clara Valley WD–to the action area substantially increases the amount of red-legged frog habitat potentially affected by the action, including designated critical habitat. The species occurs extensively in Santa Clara County, although intensive urbanization appears to have extirpated the species in much of the northernmost Santa Clara Valley and around the south San Francisco Bay (Harvey & Associates 1997). Critical habitat is designated for the red-legged frog in eastern (Unit 15), southern (Unit 16) and northwestern (Unit 14) Santa Clara County.

Santa Clara County and its cities are located within the proposed South/East San Francisco Bay Recovery Unit for the red-legged frog (USFWS 2000). This Recovery Unit contains the largest number of occupied drainages in the northern portion of red-legged frog's range. Henry Coe State Park, discussed in the draft Recovery Plan as part of a core area for the species, is in eastern Santa Clara County. Substantial areas of habitat for the species exist on private lands in the county, lands often used for grazing.

California Red-Legged Frog Critical Habitat Baseline

Units 14, 15, and 16 of critical habitat for the red-legged frog extend into Santa Clara County. The most extensive is unit 15, the East Bay–Diablo Range unit, which stretches from north to south along the eastern side of the county. This unit overlaps broadly with Alameda whipsnake critical habitat in the north. Unit 16, the Pajaro River unit, runs along the southern boundary of the county and extends into it in some places. Unit 14, the San Mateo-Northern Santa Cruz unit, overlaps some Santa Clara County area along the northwest border of the county.

Coyote Ceanothus Baseline

All known locations of the ceanothus are within 6 km (4 mi.) of each other in Santa Clara

County, straddling Highway 101 just north of Cochrane Road. Fewer than 6,000 plants are known to exist (USFWS 1998). The largest population consists of approximately 5,000 plants near Anderson Dam, partially on Santa Clara County Park property and partially on private property. Another population is recorded north of Morgan Hill and west of 101 on private land. Prior to 1993, Freas (*in litt.*, 1993) monitored the three populations of the ceanothus. She found no evidence of seedling recruitment and observed that all of the populations were composed of mature and senescent individuals (large plants with many dead branches).

The existing populations of ceanothus are threatened by residential and recreational development, unauthorized dumping, landfill activities, lack of natural recruitment (Service 1995), altered fire regimes (C. Schmidt, *in litt.*, 1996, 1998), grazing (CNDDB 1996) and stochastic (involving random or chance processes) events (K. Freas, *in litt.*, 1993). The Kirby Canyon population which occurs 3.2 km (2 mi.) west of Anderson Dam is on property leased and managed by Waste Management of California, Inc. This population is threatened by cattle grazing and dumping (CNDDB 1996). The third population (Llagas Avenue north of Morgan Hill), consisting of approximately 500 plants, occurs on private land (Corelli 1991, CNDDB 1996). Although Coyote ceanothus still occurs there, a portion of the occurrence had been developed as of April, 1997. When the site was last visited, the plants seemed to be rather senescent and all of the same age class (CDFG 1997).

The ceanothus co-occurs with the bay checkerspot and is found in the Kirby and Morgan Hill units of bay checkerspot critical habitat, flanking the southern Coyote Valley. See the bay checkerspot baseline section for a discussion of nitrogen deposition baseline. Nitrogen deposition effects on the Coyote ceanothus are uncertain at this time.

Delta Smelt Baseline Update

During May and June of 1999, over 100,000 smelt were incidentally taken at the State and Reclamation water project pumps. The allocated incidental take for those two months is 20,478. Additionally, in May and June 2000, 92,000 smelt were taken at the project pumps in the south Delta in the spring of 2000, potentially reducing the population's ability to recover (USDI-BOR, unpublished data, 2000). Smelt remained in the Delta for an extended period of time in the spring of 1999 and it was hypothesized that this was a result of cooler water temperatures.

Giant Garter Snake Baseline Update

Surveys over the last two decades have located the giant garter snake as far north as the Butte Basin in the Sacramento Valley. Currently, the Service recognizes 13 separate populations of giant garter snakes, with each population representing a cluster of discrete locality records (58 **FR** 54053). The 13 extant population clusters largely coincide with historical riverine flood basins and tributary streams throughout the Central Valley (Hansen 1980, Brode and Hansen

1992): (1) Butte Basin, (2) Colusa Basin, (3) Sutter Basin, (4) American Basin, (5) Yolo Basin–Willow Slough, (6) Yolo Basin–Liberty Farms, (7) Sacramento Basin, (8) Badger Creek--Willow Creek, (9) Caldoni Marsh, (10) East Stockton--Diverting Canal and Duck Creek, (11) North and South Grasslands, (12) Mendota, and (13) Burrel/Lanare. These populations span the Central Valley from just southwest of Fresno (i.e., Burrel-Lanare) north to Chico (i.e., Hamilton Slough). The 11 counties where the giant garter snake is still presumed to occur are: Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo.

In 1994, the BRD (formerly the National Biological Survey [NBS]) began a study of the life history and habitat requirements of the giant garter snake in response to an interagency submission for consideration as an NBS Ecosystem Initiative. Since April of 1995, the BRD has further documented occurrences of giant garter snakes within some of the 13 populations identified in the final rule. The BRD has studied populations of giant garter snakes at the Sacramento and Colusa National Wildlife Refuges within the Colusa Basin, at Gilsizer Slough within the Sutter Basin, and at the Badger Creek area of the Cosumnes River Preserve within the Badger Creek-Willow Creek area (Wylie *et al.* 1997). These populations, along with the American Basin population of giant garter snakes represent the largest extant populations. With the exception of the American Basin, these populations are largely protected from many of the threats to the species. Outside of these protected areas, giant garter snakes in these population clusters are still subject to all threats identified in the final rule. The remaining nine population clusters identified in the final rule are distributed discontinuously in small isolated patches and are vulnerable to extirpation by stochastic environmental, demographic, and genetic processes. All 13 population clusters are isolated from each other with no protected dispersal corridors. Opportunities for recolonization of small populations which may become extirpated are unlikely given the isolation from larger populations and lack of dispersal corridors between them.

Reasons for Decline and Threats to Survival: The current distribution and abundance of the giant garter snake are much reduced from former times. Agricultural and flood control activities have extirpated the giant garter snake from the southern one third of its range in former wetlands associated with the historic Buena Vista, Tulare, and Kern lake beds. These lake beds once supported vast expanses of ideal giant garter snake habitat, consisting of cattail and bulrush dominated marshes. Vast expanses of bulrush and cattail floodplain habitat also typified much of the Sacramento Valley historically. Prior to reclamation activities beginning in the mid to late 1800's, about 60 percent of the Sacramento Valley was subject to seasonal overflow flooding in broad, shallow flood basins that provided expansive areas of giant garter snake habitat (Hinds 1952). All natural habitats have been lost and an unquantifiable small percentage of semi-natural wetlands remain extant. Only a small percentage of these wetlands currently provide habitat suitable for the giant garter snake. Valley floor wetlands are subject to the cumulative effects of upstream watershed modifications, water storage and diversion projects, as well as urban and agricultural development. Although some giant garter snake populations have persisted at low levels in artificial wetlands associated with agricultural and flood control activities, many of

these altered wetlands are now threatened with urban development. Cities within the current range of the giant garter snake that are rapidly expanding include: (1) Chico, (2) Yuba City/Marysville, (3) Sacramento, (4) Galt, (5) Stockton, (6) Gustine, and (7) Los Banos.

A number of land use practices and other human activities currently threaten the survival of the giant garter snake throughout the remainder of its range. Ongoing maintenance of aquatic habitats for flood control and agricultural purposes eliminate or prevent the establishment of habitat characteristics required by giant garter snakes and can fragment and isolate available habitat, prevent dispersal of snakes among habitat units, and adversely affect the availability of the garter snake's food items (Hansen 1988, Brode and Hansen 1992). Livestock grazing along the edges of water sources degrades habitat quality in a number of ways: (1) eating and trampling aquatic and riparian vegetation needed for cover from predators, (2) changes in plant species composition, (3) trampling of snakes, (4) water pollution, (5) and reducing or eliminating fish and amphibian prey populations. Overall, grazing has contributed to the elimination and reduction of the quality of available habitat at four known locations (Hansen 1982, 1986).

In many areas, the restriction of suitable habitat to water canals bordered by roadways and levee tops renders giant garter snakes vulnerable to vehicular mortality. Fluctuation in rice and agricultural production affects stability and availability of habitat. Recreational activities, such as fishing, may disturb snakes and disrupt basking and foraging activities. Non-native predators, including introduced predatory game fish, bullfrogs, and domestic cats also threaten giant garter snake populations. While large areas of seemingly suitable giant garter snake habitat exist in the form of duck clubs and waterfowl management areas, water management of these areas typically does not provide summer water needed by giant garter snakes. Although giant garter snakes on National Wildlife Refuges are relatively protected from many of the threats to the species, water quality continues to be a threat to the species both on and off NWRs.

Populations in the Vicinity of Selenium Contamination: San Joaquin Valley sub-populations of giant garter snakes have suffered severe declines and possible extirpations over the last two decades. Prior to 1980, several areas within the San Joaquin Valley supported populations of giant garter snakes. Until recently, there were no post-1980 sightings from Stockton, San Joaquin County, southward, despite several survey efforts (Hansen 1988). Surveys during 1986 of prior localities did not detect any giant garter snakes. During 1995 surveys of prior locality records and adjacent waterways, one road-killed giant garter snake was found, and three presumed giant garter snakes were observed but not captured. Two sightings occurred at Mendota Wildlife Area, and two occurred several miles south of the town of Los Banos (Hansen 1996). In April 1998 the Dixon Field Station of the Western Ecological Research Center (U.S. Geological Survey) began a survey for giant garter snakes in the San Joaquin Valley. The effort yielded the capture of seven female and four male giant garter snakes, for a total of 11 individuals. The majority of the snakes were caught in the North Grasslands; seven were caught in Los Banos Creek west of Kesterson National Wildlife Refuge, three were caught at the Volta

State Wildlife Area, and one was caught in the South Grasslands. Snake densities in the San Joaquin Valley seemed extremely low in comparison to study areas in the Sacramento Valley (Wylie 1998). In 1999, surveys for giant garter snake were conducted by the California Department of Fish and Game out of the Los Banos Wildlife Area and were performed according to U.S. Geological Survey protocols. Fourteen new giant garter snakes were captured and eleven were recaptured as part of this effort. No captures were made in the Los Banos Wildlife Area. Fifteen snakes were captured in Los Banos Creek, and eleven at Volta State Wildlife Area. All of these recent sightings were in areas to the west of surface waters that have been impacted by agricultural drainage discharges.

In addition to California Department of Fish and Game surveys in 1999, M. Paquin of the U.S. Geological Survey conducted walking surveys in the South Grasslands during May and June 1999. Three snakes were located as a result of the surveys, two road kills and one live-capture. The live snake was captured in the Agatha Canal, one road kill was found on Santa Fe Grade Road, and one on Mallard Road near the Agatha Canal (Beam *et al.*, 1999). The sightings are within or near the Grassland Wetland Supply Channels, where water quality has improved since the onset of the Grassland Bypass Project.

Although habitat has been lost or degraded throughout the Central Valley, there have been many recent sightings of giant garter snakes in the Sacramento Valley while there have been very few recent sightings within the San Joaquin Valley. The 1995 report on the status of giant garter snakes in the San Joaquin Valley (Hansen 1996) indicates that Central San Joaquin Valley giant garter snake numbers appear to have declined even more dramatically than has apparently suitable habitat. Factors in addition to habitat loss may be contributing to the decline. These are factors that affect giant garter snakes within otherwise suitable habitat and include interrupted water supply, poor water quality, and contaminants (Hansen 1996). The recent survey data indicate that giant garter snakes are still extant in two localities within the San Joaquin, but in extremely low to undetectable numbers.

Selenium contamination and impaired water quality have been identified in the final rule listing the giant garter snake as a threat to the species and a contributing factor in the decline of giant garter snake populations, particularly for the North and South Grasslands subpopulation (i.e., Kesterson NWR area). The bioaccumulative food chain threat of selenium contamination on fish, frogs, and fish-eating birds has been well documented. Though there is little data specifically addressing toxicity of selenium (Se), mercury (Hg), or metals to reptiles, it is expected that reptiles would have toxicity thresholds similar to those of fish and birds. (58 **FR** 54053 under Factor E - Contaminants)

Threats Due to Contaminants and Impaired Water Quality: The range of the giant garter snake occurs entirely within the Central Valley of California, putting giant garter snakes at risk of exposure to numerous contaminants from agricultural, urban, and industrial/mining runoff.

Current water sources and supplies to areas supporting giant garter snakes indicate that the species is at risk of exposure to both mercury and selenium. Many areas that once supported populations of giant garter snake have received water from agricultural drainage, which may contain elevated levels of selenium or other contaminants. Selenium contamination of drain water has been identified in the San Joaquin Valley giant garter snake subpopulations (58 **FR** 54053 and references therein). In addition, streams draining the coastal ranges may contribute selenium to aquatic systems within the Central Valley.

Summary of Contaminants Threats to Giant Garter Snakes: The giant garter snake has a restricted distribution and is entirely dependent on its aquatic ecosystem. The thirteen population clusters identified in the final rule are distributed discontinuously in small isolated patches and are vulnerable to extirpation by stochastic environmental, demographic, and genetic processes. The small number of individual giant garter snakes found within the extensive wetland areas of the Grasslands Water District of the San Joaquin Valley, which for much of the last twenty years received seleniferous irrigation drainage water, may be circumstantial evidence of a selenium effect on this top aquatic predator. It is that elevated selenium levels in the San Joaquin Valley contributed to the severe decline or extirpation of the giant garter snake from the majority of this area. The remaining giant garter snake populations are exposed to impaired water bodies and existing or potential sources of selenium. As top predators, giant garter snakes are at risk of exposure to elevated levels of contaminants such as mercury and selenium. Over the life of the giant garter snake it is possible to accumulate contaminants that can impact the growth, survival, and reproduction of individuals, leading to declines in distribution. Water quality impairment of aquatic habitat that supports giant garter snakes could also reduce the prey base, contribute to bioaccumulation, impair essential behaviors, and reduce reproductive success.

Metcalf Canyon Jewelflower

The jewelflower always has been rare. The known historical distribution is as restricted as its current distribution. It is found only in the north-central Santa Clara Valley area of Santa Clara County, primarily on the east side of the valley. It can be locally abundant, but its range is limited, extending less than 20 miles from San Jose south to Anderson Lake. Furthermore, the serpentine outcrops on which the jewelflower occurs are patchily distributed and comprise only a small percentage of the area within its range (McCarten 1992). Fourteen occurrences are listed in the CNDDB, with nine occurrences more recently documented and known to be extant (CNDDB 1996). Because of genetic differences among populations, all populations of the jewelflower are valuable genetic resources (Mayer *et al*. 1994, M. Mayer, *in litt*., 1998).

The jewelflower is threatened by urbanization, overgrazing, dumping, and off-road vehicle use. Many of the extant populations are in areas of Santa Clara County being rapidly urbanized (CNDDB 1996). All nine populations are wholly or partially privately owned. One population is known to have been extirpated by being covered with fill from a housing development, and one

was probably extirpated by the construction of Anderson Dam. Three occurrences are known from historic records. Cattle grazing has contributed to reduced population sizes and could result in local extinction of the species within its range. Cattle eat or trample individual plants before they mature and set seed (K. Freas, *in litt.*, 1993). Grazing threatens one population in southeast San Jose and populations in the Metcalf Canyon area (CNDDB 1996). Road maintenance or construction threaten populations that occur on roadcuts (McCarten 1992, Service 1998). One population is adjacent to an active quarry and could be threatened by activities associated with its operations (CNDDB 1996).

The jewelflower often co-occurs with the bay checkerspot and is found in areas of bay checkerspot critical habitat within or to the east of the Coyote Valley. Serpentine habitat protection discussed under the bay checkerspot baseline has also preserved at least one significant jewelflower locality (Silver Creek Hills). See the bay checkerspot baseline section for a discussion of nitrogen deposition baseline. Nitrogen deposition effects on the jewelflower are uncertain at this time, but if the deposition enhances non-native plant survival and growth, its effect is likely to be negative.

Sacramento Splittail Baseline Update

The Interagency Ecological Program's spring 1999 20mm survey showed a significant decrease in abundance of splittail young of the year (R. Baxter, pers. comm.). This survey and spring 2000 20 mm surveys also identified a portion of the splittail population in the central and south Delta during the spring and early summer (Department unpublished data 1999). During May and June 2000, the State and Federal Water Projects in the south Delta entrained over 79,000 splittail (California Department of Fish and Game, unpublished data, 2000).

The current distribution of splittail is similar to the historic in terms of the maximum upstream limits of occurrence in main stem rivers, but the areal extent has been significantly reduced. Reclamation of land has appreciably reduced the areal extent of the distribution. The diking and reclamation of river channels, Delta Islands, and Tulare Lake have removed formerly suitable aquatic habitats. The splittail has evidently been extirpated from Coyote Creek in south San Francisco Bay. The Napa and Petaluma marshes have been diked in a manner similar to the Delta. The splittail appears to have made a transition from a widely ranging Central Valley species primarily to a species largely confined to the Delta and Suisun Marsh/Suisun Bay.

Reasons for Decline and Threats to Survival: Splittail habitat continues to be lost through the retention of water in reservoirs for municipal, agricultural, and environmental purposes, diking of formerly flooded areas, riprapping, and reductions in flow. Water diverted to storage is unavailable to inundate splittail habitat during the spring spawning season. Current efforts to save peak runoff for later release, to benefit delta smelt and listed salmonids, also reduce the effects of peak flow events downstream. splittail habitat thus is inundated less frequently and for

shorter durations.

Sand mining in Suisun Bay is also a threat to the splittail, as it disturbs the benthos upon which splittail feed. Sand mining also further depletes sediment supply in an already sediment-poor ecosystem.

Non-native species also threaten the splittail via competition for finite habitat and food resources and predation. Introduced fish, such as red shiners, golden shiners, and inland silversides may use the same floodplain habitat and their larvae compete with splittail larvae for food. Non-native jellyfish are also a threat as they compete with larval splittail for food. The jellyfish, as have Chinese mitten crabs, could also reach concentrations sufficient to impede the operation of fish screens and salvage facilities. Lastly a native copepod has been largely supplanted by three non-native forms. One of these non-native forms is difficult for larval fishes to catch because it is fast swimming and has an effective escape response. Reduced feeding efficiency and ingestion rates can weaken and slow the growth of splittail young and make them more vulnerable to starvation or predation. Reduced recruitment of new fish results in fewer fish in the population, and fewer fish which may spawn in the future.

Exports of water from the CVP and SWP pumps continue to threaten the splittail. Fish entrained at these pumps can suffer mortality from salvage, handling, and release. Predation is likely to be elevated at the release point. Continued mortality at the pumps may reduce the resilience of the splittail population and put at risk the long-term viability of the species in the estuary.

Environmental contaminants are a threat to the continued survival of splittail. Particularly near inputs of acid mine drainage within the Sacramento River watershed and in the vicinity of highly industrialized near shore areas of the lower San Francisco Bay estuary, metals such as copper, zinc, and cadmium can be directly toxic to splittail, especially in their sensitive larval stages. These metals damage gills and alter liver and nervous system functions causing death, behavioral changes, and reduced growth and reproduction. These metals can have the same effects on food items of the splittail, reducing their prey base and placing additional stress on the splittail.

Three other contaminant threats are of far greater strategic concern specifically for the continued existence of the splittail: (1) mercury, (2) selenium, and (3) agriculturally-applied organochlorine compounds. In part, these contaminant threats are of great concern because they are focused, to varying degrees, on habitat features and biological characteristics tentatively identified as particularly relevant to splittail conservation (Moyle *et al.*, 2001 Draft White Paper).

There are substantive contaminant threats that specifically apply to the splittail because of their reliance on flooded agricultural lands for spawning areas, because of their shifting dietary reliance on Asiatic clams in a region where the clams already contain enough selenium to be toxic to fish (and the clams' selenium content is still climbing), because artificial stressors, such

as salvage operations associated with entrainment at the State and Federal pumping plants make splittail especially vulnerable to interaction effects with contaminants, and because juvenile growth rates prior to out-migration are crucial for successful recruitment, yet current levels of contaminant exposure are consistent with the growth inhibition already showing up in splittail growth curves. Dangerously elevated exposures to mercury, selenium, toxaphene, and DDE have already been directly confirmed for various portions of splittail populations. Foreseeable trends in contaminant loadings to splittail environments, and in splittail feeding ecology, will lead to a worsening of contaminant threats in the near-term future.

Salt Marsh Harvest Mouse

Although information is available regarding the presence of harvest mice throughout its range, little information is available regarding harvest mice populations in a spatial or temporal scale. Typically, the baseline of the harvest mouse correlates to the condition and presence of its habitat. Historically, there has been an 84 percent reduction in tidal wetlands in the Bay Area. *R. raviventris raviventris* is currently known from the Hayward/San Leandro marshes south to Alviso and north to Bair Island. As previously described, habitat loss and/or degradation is the primary cause of decline for the harvest mouse throughout its range. Several acquisition and salt marsh restoration projects are in progress that may eventually enhance the salt marsh harvest mouse baseline in the south Bay. Management and maintenance activities associated with salt production and wastewater discharge may be impairing recovery of the harvest mouse in the area. Other factors which may contribute to the decline of the species include predation, environmental contaminants, and non-native species.

Salt marsh habitat of the salt marsh harvest mouse in the south Bay has been degraded by large and unseasonal discharges of fresh water from sewage treatment facilities in the south Bay area, such as San Jose. Salt marsh vegetation required by the salt marsh harvest mouse in turn requires salty conditions. Conversion to fresh conditions has promoted invasion of non-habitat vegetation and harmed the salt marsh harvest mouse. Increasing population and sewage load in Santa Clara County have lead to increasing freshwater effluent discharges in the south Bay.

Santa Clara Valley Dudleya

The dudleya is found only in Santa Clara County, from San Jose south about 20 miles to San Martin, on patches of serpentine soil and rock (McCarten 1993, Skinner and Pavlik 1994). Twenty occurrences are currently documented at the CNDDB; 50 are listed by Harvey & Associates (2000) in the same geographic range.

The species has been impacted by development, landfill activities, unauthorized dumping, quarry expansion, and off-road vehicles. Many occurrences are on private land, and many of these are subject to various levels of threat from development (CNDDB 1996, CDFG 1997).

In addition, grazing (McCarten 1993, K. Freas, *in litt*., 1993, D. Mayall, *in litt*., 1998 as cited in USFWS 1998) and collecting (USFWS 1995) may have impacted *Dudleya setchellii.* Grazing occurs on much of the grassland where the dudleya is located (McCarten 1993) and may result in reduced vigor or death of mature the dudleya individuals and the failure of seedling establishment (K. Freas, *in litt*., 1993). Unrestricted collecting for scientific or horticultural purposes or excessive visits by individuals interested in seeing rare plants could threaten the dudleya. Due to the slow growth rate of this species and the rarity and desirability of large succulents, mature plants found in the wild are particularly susceptible to collection (USFWS 1995).

A large dudleya population occurs on the Ranch on Silver Creek property in the Silver Creek Hills. Approximately 18,000 of the original dudleya individuals remain untouched by construction operations and will be preserved in their original locations. More than 1,000 individuals salvaged from grading operations survived in transplanted locations after two years. Other serpentine habitat protection discussed under the bay checkerspot baseline has also preserved dudleya localities at Kirby Canyon and Tulare Hill.

The dudleya co-occurs widely with the bay checkerspot and is found in most areas of bay checkerspot critical habitat around the Santa Clara Valley. See the bay checkerspot baseline section for a discussion of nitrogen deposition baseline. Nitrogen deposition effects on the dudleya are uncertain at this time.

Tiburon Paintbrush Baseline

All paintbrush plants in Santa Clara County grow approximately one mile (1.61) east of Highway 101, north of Cochrane Road and south of the Kirby Canyon landfill. The northern Kirby Canyon paintbrush population may be on a leased conservation area for bay checkerspot butterfly (N. McCarten, *in litt*., 1998). The conservation area is a 107-ha (267-acre) lease held by Waste Management Inc. to offset effects of the Kirby Canyon Landfill (Murphy 1988, Thomas Reid Associates and Murphy 1992), however, this is not currently a permanent protection. The other population, discovered following the publication of the Recovery Plan for serpentine species, is located near Pigeon Point north of Anderson Dam (D. Mayall, in litt. 1999, pers. comm. Jun. 2001).

The populations of Tiburon paintbrush in Santa Clara County occur on private land. Cattle grazing has been reported to impact some occurrences of the paintbrush (Hunter 1989). As of the early 1990s, the northern Santa Clara County population consisted of 13 plants and was subject to low levels of grazing (R. Bittman, pers. comm., 1993). Exact grazing levels at the Anderson Dam property are unknown.

The paintbrush in Santa Clara County is found in the Kirby unit of bay checkerspot critical

habitat, east of the southern Coyote Valley. See the bay checkerspot baseline section for a discussion of nitrogen deposition baseline. Nitrogen deposition effects on the Tiburon paintbrush are uncertain at this time, but if the deposition enhances non-native plant survival and growth, its effect is likely to be negative.

Effects of the Proposed Action

This biological opinion analyzes the reasonably foreseeable effects of execution of CVP Interim renewal contracts from March 1, 2002 to February 29, 2004, as described in the Project Description of this opinion.

Please refer to the 2000 Interim opinion for an analysis of many of the effects of the action. This section of the present amendment addresses only changes since 2000 or interrelated actions not considered in 2000, notably the removal of Friant, Buchanan, and Hidden contractors from the action area, the addition of Westlands WD and Santa Clara Valley WD, and an analysis of selenium loading into the DMC and downstream waters. Addition of Westlands and Santa Clara Valley WDs adds approximately 605,000 acres in western Fresno and northwestern Kings counties (Westlands WD and surrounding area) and all of Santa Clara County (service area of Santa Clara Valley WD) to the action area.

We do not address Pajaro Valley WMA in this biological opinion, because this contractor currently cannot receive their contracted CVP water, and due to infrastructure and legal constraints is not likely to during the next two years. A 50 acre-feet contract with El Dorado Irrigation District (for Lake Hills Estates) also is not addressed, since Reclamation has indicated that this contract will not be supplied under the proposed Interim Contracts. We therefore find no need to analyze the effects of these contracts at this time.

Santa Clara Valley Water District
This contractor may receive up to 6,260 acre-feet. of CVP water in any given year, typically in drier years. While a relatively small contract, this amount augments Santa Clara County's limiting supply–the amount available during droughts–and consequently could support continued growth in the county, including municipalities within the district. For example, assuming average residential use of about 100,000 gallons per year, the contract amount is capable of supplying water for about 20,000 new single-family detached homes. Because of the commingling of supplies in underground aquifers, Santa Clara Valley WD may not be able to control growth-inducing effects of this increase in supply. In the service area of the Santa Clara Valley WD, unlike most contractors, conversion of habitats supporting listed species may be more likely to result from residential and commercial development than agriculture.

Sizeable and vitally important areas of remaining serpentine habitat for the bay checkerspot butterfly, Coyote ceanothus, Santa Clara Valley dudleya, Metcalf Canyon jewelflower, and Tiburon paintbrush lie within the limits of growing Santa Clara County, including the City of San Jose and other municipalities. The California Court of Appeals recently ruled, in response to a

citizens' suit, that the City of San Jose's zoning need not be consistent with its General Plan (San Jose Mercury News, May 10, 1997, p. 2B). The City, therefore, may be limited in its ability to guide growth and development in environmentally sensitive areas. Development is somewhat restricted by the City's voter-initiative "greenline," or urban growth boundary. However, development outside the greenline can occur, and within the City is governed by a slope density formula, generally resulting in lot sizes of 20 acres (8.1 ha) or larger. Outside of the incorporated areas, important serpentine habitats and associated listed species are threatened by development in unincorporated Santa Clara County.

Human population growth and associated development in Santa Clara County have other, less direct, impacts on listed species. Increased automobile use, power generation, and industrial activity cause increases in nitrogen-bearing air pollution. This excess airborne nitrogen is then deposited through atmospheric processes on surrounding areas, including sensitive serpentine soil habitats supporting listed species. The effects of excess nitrogen deposition are discussed in detail in the bay checkerspot Environmental Baseline section, above. In summary, the nitrogen addition acts as a fertilizer, and enhances the growth of non-native invasive plants that crowd out or shade out food plants of the bay checkerspot, and also likely compete with endangered Tiburon paintbrush and Metcalf Canyon jewelflower plants. Adverse effects on Santa Clara Valley dudleya and Coyote ceanothus are possible but uncertain at this time. Since air pollution in much of the county is already at levels likely to be affecting many serpentine habitats, additional pollution with exacerbate the problem.

Another indirect effect of growth in Santa Clara County arises from sewage effluent and the resulting freshening of salt marshes. This effect was discussed in the Baseline section for California clapper rail and salt marsh harvest mouse. In summary, human population increase and increased total water use leads to increases in sewage load and ultimately to treated effluent. Treated effluent in northern Santa Clara County has lower salinity than the south San Francisco Bay waters into which the effluent flows. These fresh and unseasonal flows (remaining high in summer and fall when natural flows are minimal) result in the degradation of salt marsh habitat of clapper rails and salt marsh harvest mice, because their habitat requires saline conditions. Most of Morgan Hill and south in Santa Clara County are in the Pajaro River watershed and do not drain to the south San Francisco Bay. Use of the contract water in this southern watershed would not be likely to adversely affect California clapper rail or salt marsh harvest mouse. . . Construction of a water recycling (high-level treatment) facility and distribution system in the greater San Jose area, funded in part by Reclamation, will reduce somewhat the volume of freshwater effluent reaching the south Bay in the short term.

Overall, the growth-inducing effects of the proposed water contract deliveries to Santa Clara Valley WD are reduced by the following considerations: the relatively small amount of the contract (6,260 acre-feet maximum); the short term of the Interim water contract authorization (two years); the County, City of San Jose, and District's commitment to develop an HCP to

address long term conservation needs; and the County and City's commitments as part of the HCP process to develop and implement, in coordination with the Service, short term ("interim") measures to minimize impacts to listed species until the HCP is approved. However, the Service is not currently aware of any significant progress in developing and implementing these interim procedures.

Westlands Water District

Much of the effects discussion in the 2000 Interim biological opinion is generally applicable to Westlands WD. Westlands WD includes habitat types with value to listed species, including lands that have not been irrigated. San Joaquin kit fox, kangaroo rats, blunt-nosed leopard lizards, and other listed species are likely to use the area. Also within the CVP "consolidated place of use" are so-called expansion lands, which are not irrigated but have been approved as part of the CVP place of use. Many of the "expansion" lands have habitat value, and are adjacent to and connected to other habitat.

Otherwise, most of Westlands is converted, irrigated farmland. Reclamation has taken steps to assure that the Interim contracts do not result in conversion of listed species habitat, and according to Westlands WD the water would be used on existing irrigated croplands. The maximum 6,260 acre-feet proposed would be adequate to irrigate perhaps 2,000 to 5,000 acres. We therefore expect that the impact of the proposed action to the conservation status of listed species would not be appreciable for the two year interim period.

Selenium-Related Effects

Project water deliveries, and their consequent use on crops on seleniferous soils or soils with a shallow selenium-bearing water table, result in selenium-bearing drainage. Such drainage sometimes reaches listed species habitats and affects them either directly or through food chain concentration and ingestion. Problematic areas for irrigation because of selenium-bearing drainage were identified in the final report of the San Joaquin Valley Drainage Program (SJVDP 1990, sometimes known as the "Rainbow Report"), and overlap the service areas of several proposed Interim contractors. Although an essential micronutrient, selenium has a very narrow range of beneficial effect and quickly shows toxic effects at higher concentrations. Recent information has become available on the prevalence and effects of selenium in the action area. Effects of the proposed action on selenium exposure of giant garter snake and Sacramento splittail are discussed below.

Giant garter snake

Selenium Toxicity in Giant Garter Snake: Toxicity information on reptiles such as the giant

garter snake is very limited. Studies on pine snakes (*Pituophis melanoleucus*) have shown that, unlike metals such as lead and mercury, selenium concentrations are greater in body tissue than in skin tissue (Burger, 1992). Endemic to wetlands in the Sacramento and San Joaquin Valleys, the giant garter snake inhabits marshes, sloughs, ponds, small lakes, low gradient streams, and other waterways and agricultural wetlands, such as irrigation and drainage canals and rice fields. Giant garter snakes feed on small fishes, tadpoles, and frogs (Fitch 1941; Hansen 1980; Hansen 1988). These habitat preferences and predatory foraging habits put the giant garter snake at risk of selenium exposure.

As top predators, giant garter snakes are at risk of exposure to elevated levels of contaminants that bioaccumulate such as mercury and selenium. Over the life of the giant garter snake it is possible for snakes to accumulate contaminants that can impact the growth, behavior, survival, and reproduction of individuals, leading to declines in numbers and distribution. Water quality impairment of aquatic habitat that supports giant garter snakes could also reduce the prey base for the species.

The Department of the Interior's *Guidelines for the Interpretation of the Biological Effects of Selected Constituents in Biota, Water and Sediment* (USDI Guidelines*)* summarize background selenium levels in lizards, pine snake hatchlings from New Jersey (USDI-BOR/FWS/GS/BIA 1998), and snakes collected from the San Joaquin Valley. Alligator eggs from Florida suggest that reptile eggs are at the same selenium background level as fish and bird eggs (1-3 ppm). In the San Joaquin Valley, background levels of selenium in frog tissue range from 1.0 ppm to 3.6 ppm dry weight. Livers from gopher snakes in reference sites near Kesterson contained 1 - 4 ppm selenium. Skinless, whole-body pine snake hatchlings (considered representative of snake eggs) from New Jersey averaged 2.6 ppm. The USDI Guidelines state that it is probably safe to assume whole body concentrations at or above 10 times normal background (or $\geq$20 ppm) are toxic to populations of sensitive species (USDI-BOR/FWS/GS/BIA 1998). Further, the USDI Guidelines state that reproductive impairment is likely to be the most sensitive response and snake eggs with selenium concentrations $\geq$10 ppm are being reproductively impaired.

In the absence of a species-specific selenium toxicity model for the giant garter snake the Service would recommend using an avian risk model for selenium based on the close phylogenetic relationship of birds to reptiles (e.g., Romer 1966; Porter 1972; Storer *et al.* 1972). Although giant garter snakes are live-bearing, newly born garter snakes have yolk sacs like other egg-laying species. Using such an avian risk model, the Service concluded in the draft California Toxics Rule biological opinion that a selenium criterion of 5 ppb in water would jeopardize the giant garter snake. The Service has stated that a 2 ppb (monthly mean) standard for wetland water supply channels in the Grasslands (which was adopted by the State in the Grasslands Amendments) should be protective of giant garter snakes and their habitat. However, various results for water concentrations of selenium as low as 0.5 ppb suggest that bioaccumulation can sometimes result in problematic selenium levels in benthic organisms and fish (trout) even at

selenium levels below 2 ppb in water (Saiki and Palawski 1990; Luoma and Presser 2000).

Mercury levels in fish from the lower San Joaquin River and Mud Slough have been found to be elevated (Davis *et al.* 2000; Slotton *et al.* 2000). The ultimate source is likely the New Idria Mine located in the Panoche/Silver Creek watershed. It has been shown that mercury added to a selenium-enriched test diet of mallards increased the amount of selenium stored in the mallards eggs (Heinz and Hoffman 1998). The potential for this interactive effect between mercury and selenium to occur in giant garter snakes in the Grassland Bypass Project area is of concern and warrants study.

Selenium in Grassland Wetlands Source Water: In water year 2000, the average selenium concentrations of all composite samples of fish collected from Salt Slough (a Grassland wetland supply channel where biological monitoring has occurred) was 2.6 ppm (n=66), below the Grassland Bypass Project warmwater fish level of concern threshold (4 ppm), and significantly below the pre-Project average (6.7 ppm, n=78). A composite sample of four bullfrog tadpoles collected in Salt Slough in August 1999 had about half the selenium concentration (2.6 ppm) of a single bullfrog tadpole collected in March 1993 (5.8 ppm). However, the selenium concentration was higher in a composite sample of three bullfrog tadpoles in June 2000 (2.9 ppm), and still higher in August 2000 (7.5 ppm in a composite sample of three tadpoles), the August samples being within the level of concern range for warmwater fish (4-9 ppm) from Grassland Bypass Project Guidelines (Beckon *et al.*, 2001). The August 2000 tadpole data indicate that selenium in the foodchain of the giant garter snake may still be of concern in the Grassland wetland supply channels, at least during some times of the year and during some water year types.

Although selenium levels in the Grassland wetland water supply channels have decreased substantially since the implementation of the first Grassland Bypass Project in September 1996, the 2 ppb (monthly mean) water quality objective promulgated by U.S. EPA and adopted by the State to protect Grassland wetland habitat has been exceeded in at least some of these canals on numerous occasions since 1996 (Chilcott, May 2000). Of note are exceedences of the 2 ppb water quality standard observed in wetland water supply channels during the months of March and April 2001. According to Reclamation data, there were elevated selenium concentrations during March and April 2001, with water concentrations of 2.38 and 3.32 ppb, respectively, reported at Bass Avenue, the Delta Mendota Canal (DMC) terminus. The DMC is the water supply source for the Grassland wetland supply channels and the agricultural lands in the Grasslands Drainage Area (GDA). These elevated DMC concentrations likely influenced the significant exceedences of the 2 ppb water quality standard for Grassland wetland water supply standard during March and April 2001 at 5 sampling locations in the Grasslands, where measured concentrations reached a high of 7.6 ppb at station K (Agatha Canal) on March 7, 2001 (Grassland Bypass Project, Monthly Data Report, May 2001). It is possible that some of this peak in selenium in source waters of the DMC during March and April 2001 could be explained by surface water runoff from Panoche/Silver Creek watershed (outside of the GDA) that occurred

on March 5, 2001, subsiding after March 10, 2001 (McGahan, in litt., June 21, 2001). However, the Data Collection and Reporting Team of the Grassland Bypass Project noted that, while the McGahan memo could serve as one hypothesis for exceedences of the 2 ppb (monthly mean) standard, the peaks in selenium concentrations in many cases came either before or too long after this storm event to explain all the exceedences.

Sacramento splittail

Selenium Toxicity to Fish: Recently, research on toxic effects of selenium on fish was reviewed and summarized by Lemly (1996b). Lemly reported 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 ppm (dry weight.). In juvenile chinook salmon (*Oncorhynchus tshawytscha*), smoltification (the process by which fish morphologically, behaviorally and physiologically adapt to living in seawater after living in freshwater) and migration to seawater were impaired when whole-body concentrations of selenium reached about 20 ppm (dry weight). Mortality among larvae, a more sensitive life stage, occurred when concentrations exceeded 5 ppm (dry weight). Whole-body concentrations of selenium in juvenile striped bass (*Morone saxitilis*) collected from areas in California impacted by irrigation drainage ranged from 5 to 8 ppm (dry weight).

Summarizing studies of warm-water fish, Lemly (1996b) reported that growth was inhibited at whole-body concentrations of 5 to 8 ppm (dry weight) 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 ppm selenium. Whole-body selenium concentrations of only 4 to 6 ppm (dry weight) were associated with mortality when juvenile bluegill (*Lepomis macrochirus*) were fed selenomethionine-amended commercial diets in the laboratory. When bluegill eggs contained 12 to 55 ppm selenium (dry weight), 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 ppm selenium (dry weight) and water containing 4.8 ppb selenium exhibited blood changes and gill damage that reduced respiratory capacity while increasing respiratory demand and oxygen consumption. In combination with low water temperature (4 degrees centigrade) these effects caused reduced activity and feeding, depletion of 50 to 80 percent of body fats, and significant mortality within 60 days. Winter stress syndrome resulted in the death of about one-third of the exposed fish at whole-body concentrations of 5 to 8 ppm selenium (dry weight).

Based upon a review of more than 100 papers, Lemly (1996b) recommended the following toxic

effects thresholds in freshwater and anadromous fish exposed to elevated concentrations of selenium (dry weight basis): 4 ppm whole body; 8 ppm skinless fillets; 12 ppm liver; and 10 ppm ovary and eggs. He also recommended 3 ppm 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-ppb range, bioconcentration factors in phytoplankton are about 3,000 (i.e., selenium concentrations in these plankton are 3,000 times higher). He concluded that patterns and magnitudes of bioaccumulation are similar enough among various aquatic systems that a common number, 2 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".

Selenium Toxicity to Sacramento splittail: Selenium contamination of splittail has major implications for the species' ability to successfully tolerate at least two sources of stress that have been identified in the P. Moyle *et al.* draft White Paper on Sacramento splittail (Moyle *et al.* 2001). Splittail apparently experience substantive post-spawning stress. 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, whereas multiple stressors are typical of real ecosystems (Cech *et al.* 1998).

Excessive environmental selenium weakens the immune defenses of fish and wildlife, and can also trigger pathogen and toxin challenges that would not otherwise have occurred (Tully and Franke 1935; Whiteley and Yuill 1989; Larsen *et al*. 1997; Wang *et al*. 1997).. For example, a red tide flagellate (Chattonella verruculosa) that causes mortality of fish such as yellowtail, amberjack, red and black sea bream, has recently been discovered to require above-normal exposure to selenium (Imai *et al.* 1996). Only when selenium extracted from contaminated sediments is added to growth media can C. verruculosa sustain rapid growth (i.e., toxic blooms). The level of contamination required to sustain rapid growth is only about twice normal background. Potential effects of selenium-mediated vulnerability to non-chemical stressors must be considered when assessing the threats of exposure of splittail and other listed species to selenium. Current artificial hydrological conditions and altered ecological conditions are subjecting splittail populations to levels of stress unprecedented in the species prior history, while exposing splittail to artificially elevated selenium concentrations. Each of these factors alone poses serious threats to splittail; together they may pose synergistic threats greater than the sum of the parts. Under current conditions of reduced population and range and environmental stress, splittail are vulnerable to major impacts from epidemic disease, contaminant spills, or other catastrophic events.

Some fish are known to concentrate selenium in their eggs, or in live young in the case of live-bearers. Concentrations of 3 times the female body concentration are not uncommon (W. Beckon, Service, pers. comm. August 2001). This may be of concern because eggs are a highly active developmental stage, and as such are sensitive to developmental disruptors like selenium. We are not aware of studies of this phenomenon in splittail, but given findings of elevated selenium in some splittail we believe it needs further investigation.

Moyle *et al.* (2001) hypothesize that success of juvenile splittail downstream migration is strongly linked to the size they achieve prior to leaving the spawning areas. A minimum size of 25 mm appears to greatly enhance success. Selenium and other contaminants are known to impair juvenile growth rates (Jarvinen and Ankley 1999), which would reduce the number of splittail juveniles reaching the critical 25 mm length in time for migration.

Effects in Salt Slough: In 1998, Sacramento splittail were caught in Salt Slough for the first time in the eight year sampling history of the Grassland Bypass Project monitoring program. This was likely due to El Nino storms and extended high flows allowing the fish greater access to potential shallow water breeding areas in the San Joaquin Valley. Based on studies of its selenium effects on salmonids, that negative effects of selenium could be expected to be seen at in splittail within a level-of-concern ranging from 4 to 9 ppm (dry weight). The splittail composite sample of 10 fish collected from Salt Slough had a selenium concentration somewhat below this level-of-concern range (3.19 ppm, dry weight basis; Beckon *et al.* 1999). Because of the averaging effect of the composite sample, however, it is entirely possible that some of these individual fish had body burdens of selenium within the level of concern, and were experiencing adverse effects, while others had lower levels. Such variation is typical of data on fish contaminant burdens.

Effects in the San Joaquin River: The San Joaquin River is the only current means by which drainage is removed from the San Joaquin Valley. The disposal of selenium-laden drainage is problematic because of the potential for ecological damage from selenium contamination in receiving waters and downstream in productive estuarine waters. Segments of the lower San Joaquin River, Mud Slough (North), and the San Francisco Bay-Delta Estuary, all downstream of the agricultural discharge from the Grassland Drainage Area, are listed by the State as water-quality impaired under the Clean Water Act. From 1965-1994 the flows of the San Joaquin River were almost completely diverted and recycled through the State and Federal pumping facilities in the south Delta (CSWRCB, 1994; Luoma and Presser 2000).

Toxicity problems may not appear equally in all components of a hydrologic unit because some components may be more sensitive than others. For example, the San Joaquin River, as a flowing water system, may be less sensitive to selenium effects (especially if selenate dominates inputs as is the case with drainage from the San Joaquin Valley) than adjacent wetlands, the Delta or the Bay, where residence times and biogeochemical transformations of selenate are more likely. The sources and fate of selenium in the Delta will be a key to determining what actions are

necessary to restore the estuary and aid in the recovery of splittail (T. Presser, USGS, in litt., February 26, 2001).

Effects in the Delta: It is not currently well understood how much of the San Joaquin River flows into the Bay-Delta estuary. After the 1994 Bay-Delta Water Accord (CSWRCB, 1994), water management changed, and more selenium may reach the Bay-Delta as less recycling of the San Joaquin River occurs. The amount of selenium-bearing San Joaquin River flow reaching specific locations in the Bay-Delta is can be influenced by: tidal cycles; variable flows of the Sacramento River and San Joaquin River due to seasons and upstream withdrawals, quantity of water diverted from the Delta to the Central Valley Project, State Water Project and local water users; discharge of agricultural drainage from the San Joaquin Valley and drainage inputs within the Delta itself; channel configurations and capacity; and artificial barriers which periodically are constructed to route flows in the Delta. Manipulations of barriers, modification of the channels, or construction of alternative diversion facilities could all affect (or are affecting) how much San Joaquin River flow reaches the Bay-Delta. Better understanding of water movement from the San Joaquin River through the Bay-Delta and processes within the estuary are critical to future evaluations of the effects selenium-laden drainwater on Delta fish and wildlife resources including Sacramento splittail (Luoma and Presser, 2000).

Data from the Tracy Fish Collection Facility from 1997 indicate that water being pumped into the Tracy Pumping Plant can at times contain elevated selenium concentrations. Waterborne selenium concentrations at the Tracy Fish Facility ranged as high as 4.5 ppb in the month of March 1997 (Craft *et al.*, January 2000). Although this concentration is below the current U.S. EPA and State adopted 5 ppb selenium water quality standard, this value is still above background concentrations in water, above the 2 ppb the Service considers to be a level above which adverse effects in wildlife occur, and is well above the selenium concentration in the Sacramento River (0.06 ± 0.2 ppb) (Cutter and San Diego-McGlone, 1990). It has been shown that even in waters containing 1 ppb or less selenium (e.g., Suisun Bay), sufficient bioaccumulation can occur in the food chain to pose a hazard to higher trophic level organisms (Luoma and Presser, 2000). This data suggests that at least during some water years types or months, much of the San Joaquin River flow can be redirected into the Tracy Pumping Plant and influence water quality in CVP diversions and potentially affect splittail that forage near the pumps.

Recent results of chemical analyses from samples of splittail collected at the Tracy Pumping Plant from May 31 to August 2, 2000, revealed whole body selenium concentrations ranging as high as 3.8 ppm (dry weight). Ten of the fourteen samples exhibited selenium concentrations of less than 2 ppm (normal range; W. Beckon, U.S. Fish and Wildlife Service, unpublished data, August 2001). These fish ranged from 9 to 30 centimeters in length. It is unknown if splittail are being affected by selenium in the south Delta, or why the splittail collected at the Tracy Pumping Plant were less contaminated than focused sampling of splittail in Suisun Bay (see

below) and Mud Slough (data discussed in Grassland Bypass Project biological opinion, issued September 27, 2001, file 1-1-01-F-0153). Further research on the effects of selenium on splittail in the south Delta is warranted.

Biological sampling in the Suisun Bay has shown that tissue selenium residues in predators and selenium concentrations in their food chain both point to threats to the reproductive health of aquatic listed species in the Delta (Luoma and Presser 2000) when compared to laboratory and field studies conducted elsewhere (Lemly 1996a, Skorupa 1998, Engberg *et al.* 1998). The magnitude of existing contamination is sufficient to threaten reproduction in key species within the ecosystem. The most severely threatened species appear to include Sacramento splittail. Populations and catches per unit effort (where known) of all these species are in decline. "Restoration" of the Bay-Delta must include stabilizing or increasing the populations of these species, and one way to facilitate that goal is to control the stress selenium imposes on these animals (Luoma and Presser 2000).

Selenium is readily bioaccumulated in the introduced Asiatic clam (*Potamocorbula amurensis*), which became the most common bivalve in the Delta during the 1990s (Luoma and Presser 2000). These clams have selenium concentrations ranging from 6 to 20 ppm (dry weight), the variation coinciding with seasonal changes in mean monthly river inflows to the north Bay– higher concentrations are observed during low flow periods. Asiatic clams are, in turn, consumed by splittail (Stewart *et al.* 2000). The splittail "White Paper" addresses the recent shifting dietary emphasis of splittail toward Asiatic clams (Moyle *et al.* 2001) and Stewart *et al.* (2000) have used stable isotope analyses to confirm that splittail diets are more characteristic of the clam food chain than the crustacean food chain. Dietary concentrations of 5 to 20 µg selenium per gram dry weight (i.e., almost exactly the range found in Asiatic clams) are known to cause severe reproductive problems in fish (Lemly 1997a, 1997b, 1997c). Stewart *et al.*'s unpublished splittail data cluster relatively close to the data for white sturgeon. Eggs of white sturgeon have already been documented to contain selenium concentrations exceeding those levels that resulted in 65 percent failure of selenium-exposed bluegill eggs (USDI-FWS and NMFS 2000). Stewart *et al.*'s study found that selenium liver concentrations in Sacramento splittail (greater than 170 mm in length) in Suisun Marsh in the fall of 1999 were at levels associated with adverse reproductive effects in fish and ranged as high as 20 ppm (dry weight; Stewart *et al.* 2000). Additionally, the selenium concentrations of Asiatic clams in the lower San Francisco Bay estuary have risen significantly in recent years and several realistic future scenarios evaluated for U.S. EPA by USGS scientists predict even further increases of selenium loading to the estuarine Asiatic clam food chain (Luoma and Presser 2000). The relationship between the bioaccumulation of selenium in the clam and its predation by splittail also threatens the splittail in the near-term future because the clam, via its predation on typical splittail prey items such as estuarine copepods (*Eurytemora affinis*, and *Acartia* sp.) (Kimmerer and Peñalva 2000), is creating conditions that promote increasing reliance of splittail on the clam as an alternate food source (Feyrer and Matern 2000). Thus, the most likely near-term scenario for the

future is greater reliance of splittail on Asiatic clams as a food supply and possibly further increases of selenium concentrations in both Asiatic clams and splittail.

Moyle *et al.* 2001 (draft White Paper) have already presented data demonstrating statistically significant declining growth rates in Suisun Marsh splittail between 1980 and 1995 (prior to the onset of the first Grassland Bypass Project). The declines in growth rate are likely to be associated with the invasion by the Asiatic clam in the estuary, and the subsequent dietary shift of splittail to a clam-dominated diet. Moyle *et al.* suggested that this trend might reflect poorer energetics of a non-mysid shrimp dominated diet, but it can just as plausibly be suggested that it reflects the cachexia (contaminant-induced weight loss despite calorically sufficient dietary intake) that is a classic symptom of non-lethal selenium poisoning. Contaminant-induced growth depression among juveniles in spawning and rearing areas would mean that longer times would be required to allow enough growth for optimal out-migration of juveniles. Increasing levels of contamination (via the yolk sac or post-larval dietary exposure; i.e., from contamination of the adults or juveniles), as are already foreseeable (Luoma and Presser 2000), conceivably could lead to juvenile growth rates too slow for even the longest contemporary durations of flood plain inundation. Reduced growth also causes a reduction in fecundity because fecundity in splittail is related to female body size, as is common among fish.

The U.S. Geological Survey (USGS), developed a model to forecast effects of selenium from various sources in the Delta estuary (Luoma and Presser 2000). At the request of the U.S. EPA and the Service, the USGS used this model to provide monthly forecasts for selenium concentrations in the Delta in a dry year (1994 hydrology) and a wet year (1997 hydrology) using selenium loads limits from Appendix A of the Use Agreement from the Grassland Bypass Project for 2005 (total = 3,996 pounds per year) (Presser, August 2001). Greater detail on this analysis is provided in the Grassland Bypass Project biological opinion. In the model run using wet year flow data, the model indicated Asiatic clams in the Delta would contain above 3 ppm selenium, dry weight (a level of concern threshold for invertebrates in the GBP Guidelines), during seven months of the year, including all months during the low flow period (June - November). During September and October, the clams were projected to exceed the toxicity threshold for invertebrates in the GBP Guidelines, with projected clam tissue selenium concentrations of 8.1 and 7.2 ppm, respectively (Presser, August 2001).

In the model run using flow data from a dry year, the model outcome indicated that Asiatic clams in the Delta would fall above 3 ppm selenium (dry weight) in all months of the year. In addition, the clams were projected to be above the toxicity threshold for selenium in invertebrates during the entire low flow period (June -November). The highest concentrations occurred in August and October with projected clam tissue concentrations of 12.5 and 10.5 ppm, respectively (Presser, August 2001).

Although this model was run based on a number of the assumptions, it does show a potential for

significant accumulations of selenium in biota of the Delta especially during dry water years and low flow months. These periods of low San Joaquin River flow combined with selenium loading could result in an increased risk of adverse effects to Sacramento splittail from selenium exposure in the Delta. These outcomes are consistent with those reported by Luoma and Presser (2000). The most significant impacts of irrigation drainage disposal into the San Joaquin River and the Bay-Delta appear most likely to occur during low flow seasons and especially during low river flow conditions in dry or critically dry years. Dry or critically dry years have occurred in 31 of the past 92 years (34 percent), with critically dry years comprising 15 of those years (16 percent). Any analysis of selenium effects must take the influences of variable river flows into account (Luoma and Presser, 2000). Years of low flow are also the most difficult for splittail reproduction, with spawning and rearing restricted to channel shallows with appropriate habitat.

In Appendix I (Response to Comments), pages I-61 of the Grassland Bypass Project Final EIS/EIR (USDI-BOR 2001), the following was noted, "The elevated selenium levels in these Suisun Bay organisms are caused by selenite discharges from oil refineries around Suisun Bay, entering the food chain through bioconcentration by phytoplankton that preferentially take up selenite...Because selenate is the thermodynamically stable form of selenium in oxygenated water, it is not transformed to selenite and makes a much smaller contribution to selenium in the Suisun Bay food chain than the refinery selenite." While it is true that the refineries once did account for the majority of selenium contamination in Suisun Bay, and the form of selenium discharged was selenite, this is no longer the case. As a result of regulations imposed by the San Francisco Bay Regional Water Quality Control Board, refinery inputs to the Bay-Delta declined after July 1998. Oil refinery loads from 1986 to 1992 ranged from 11 to 15 pounds of selenium per day; but with treatment and cleanup, loads decreased to 3 pound of selenium per day in 1999. Further, treatment technologies in the refineries remove only selenite, so the selenium discharged is mostly selenate since 1999, while historic discharges were over 50% selenite (Luoma and Presser, 2000). Despite the radical decline in refinery discharges of selenium, particularly selenite, the concentration of selenium in suspended particulates in the estuary essentially has not changed between the 1980's and late 1990's (Cutter *et al.*, 2000).

At this time, the source(s) of the selenium contamination in the Delta and Suisun Bay is/are not fully understood, although agricultural drainwater disposal into the San Joaquin River appears likely to be a contributing source of this contamination, given the data discussed above. Additional information is needed to determine the fate and impact of selenium discharges from the west-side San Joaquin Valley and oil refineries in the North Bay, and to assess the impacts that agricultural drainage discharges in the San Joaquin River may have in the Delta ecosystem.

Selenium from Firebaugh Sumps and in the DMC

In the vicinity of the Firebaugh Canal Water District, a San Joaquin Exchange Contractor (not an Interim contractor) receiving deliveries from Reclamation out of the Delta Mendota Canal,

Reclamation operates sumps that pump water into the DMC. The DMC was completed in July 1951. It is lined with concrete to Milepost 98.64, and the remaining 18 miles to Mendota are earth-lined. In October 1951, local interests objected to the earth lining of the DMC. They were concerned that canal seepage might raise groundwater levels in adjacent lands. Also, the DMC might act as a subsurface dike, impeding subsurface cross-drainage, and causing elevated groundwater levels on the upslope side. In response to these concerns, Reclamation constructed closed drains between Mileposts 99 and 110 parallel to the Canal. The drains collect small quantities of seepage water or surface runoff to prevent accumulation and possible damage to canal bank or adjacent lands. The drains discharge into ten sump pits from which the accumulated water is automatically removed by pumping. Water from the sumps is discharged into the DMC through six drainage inlet structures. The Firebaugh sumps are located within 1-3 miles of the San Luis Drain, the conveyance structure used to remove selenium contamination in the Grasslands and used to convey drainage from the Grassland Bypass Project. The San Luis & Delta-Mendota Water Authority (Authority) has operated the DMC (including the Firebaugh sumps) for Reclamation since 1992.

Flows from the sumps are not routinely measured, but are correlated to electricity drawn by each sump pump. This information is consolidated by Reclamation. Seasonal conversion factors were used to derive the discharge in cubic feet per second. The average daily flow, from all of the sumps together, is estimated to be 1.5 cubic feet per second (cfs), based on 933 observations of electrical usage.

Water from the sumps has been sampled and tested by Reclamation in accordance with the 1987 Monitoring and Reporting Program Order Number SJR027 issued by the California Regional Water Quality Control Board. Reclamation collected water quality samples of water in each drainage inlet monthly from March 1985 through September 1994. Since 1995, samples have been collected twice a year, in April and October. Based on 661 samples, the flow-weighted concentration of water discharged from the six drainage inlets is 228 ppb selenium. Based on an average flow of 1.5 cfs and a flow-weighted concentration of 228 ppb selenium, the annual selenium load from the Firebaugh sumps to the Delta Mendota Canal is estimated to be 679 pounds selenium/year, based on the best available data (USBR in litt.).

Through a variety of water conveyances, an unknown amount of the selenium load from the Firebaugh sumps is added to the Grasslands wetlands, San Joaquin River, and Delta loads. Approximately 93 miles of natural and human-made water channels deliver freshwater to the Grassland wetlands, as listed in Appendix 40 of the 1996 Basin Plan Amendment. For the purposes of this biological opinion, these water supply channels are referred to as the "Grasslands wetland supply channels." The Grassland wetland supply channels have been and are currently used to convey some agricultural drainage to the San Joaquin River. The water quality objective in these channels is 2 µg/L (ppb) selenium or less (monthly mean) as adopted by the Regional and State Water Resources Control Board in the Basin Plan amendments of

1996.

Since March 2000, the wetland water supply objective of 2 ppb (monthly mean) was exceeded during two months in Camp 13, three months in Agatha Canal, nine months in the San Luis Canal, and two months in the Santa Fe Canal. All of these canals convey water supplies from the Delta Mendota Canal to Grassland wetlands.

The source(s), quantities, and seasonal variation of selenium contamination in Grassland wetland supply channels are not currently known. Inflow from the Firebaugh sumps is a likely contributor to this contamination. Additional sources of contamination may include: surface runoff from the Panoche/Silver Creek watershed, flood flows through existing check drains, and groundwater pumping into the Mendota Pool (Chilcott 2000). Selenium concentrations in supply water tend to increase between O'Neill Forebay and the DMC terminus, especially in the reach between Farm Bridge and Washoe Avenue where the sumps are located. A water concentration of 2 ppb selenium was exceeded in the DMC one-half mile downstream of the sumps in 7 of 24 samples from 1999 through 2001. Data from the DMC upstream (at Farm Bridge) and downstream (at Washoe Ave) in 1999-2001 show that selenium concentrations increased downstream of the sumps in 30 of 36 samples. The average increase in concentration was 0.94 ppb. Seasonally, the exceedances in 1999-2001 occurred in the winter and spring (December to April), coinciding with the period when flow in the DMC is stopped for maintenance of the Mendota Dam or when flood water is flowing through the Mendota Pool from the San Joaquin River (USBR unpublished data).

Multiplying the DMC inflow in March and April 2001 by the selenium concentrations at the DMC terminus results in a calculated load to the Mendota Pool of 352 pounds in March and 464 pounds in April (G. Browning, Luhdorff and Scalmanini, Consulting Engineers, in litt., July 17, 2001). Flow and concentration data from Reclamation, collected at the DMC terminus from 1996 to 2000, indicate that annual loading of selenium in the DMC averaged 3,238 pounds of selenium per year with a high of 6,194 pounds of selenium in 1996 (USBR, unpublished data). Much of this selenium comes from unspecified sources other than the Firebaugh sumps, including selenium "recycled" through the San Joaquin River to the south Delta water project pumps and thence back to the DMC.

The selenium load in the DMC, which has contributed to exceedences of 2 ppb in Grassland wetland water supplies, adds to elevated levels of selenium in the aquatic food chain and may cause adverse effects in the giant garter snake in the Grasslands wetlands area (see above). Selenium loading downstream from the DMC, through the Grasslands, Grasslands Bypass Project and other routes to the San Joaquin River and Delta, also adds to cumulative selenium load in the Delta, with resulting intensification of selenium contamination effects to Sacramento spittail (see above). Exactly how much of the selenium reaching the Grasslands wetlands and the Delta comes from the Firebaugh sumps or other sources under the close control of Reclamation is

still unclear from the data provided, but it is clear that an appreciable fraction of the cumulative load is contributed by such sources. Given that selenium in Delta food chains is already at levels likely to be impairing splittail reproduction and growth, we expect that additions to the cumulative load are injuring the species.

Cumulative Effects

Please refer to the 2000 Interim biological opinion for a discussion of cumulative effects. For the Santa Clara County species added in this amendment, cumulative effects are likely to result from a variety of non-federal activities, including continued non-native plant impacts, fire and fire suppression, grazing, collecting, off-road vehicle use, and residential and commercial development, nitrogen deposition and sewage effluent discharge unrelated to the proposed action.

Conclusion

After reviewing the current status of the species in Table 1A, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the species listed in Table 1A, and is not likely to destroy or adversely modify critical habitat, where designated. This conclusion is based on the assumption that the action is implemented as described in this biological opinion.

Incidental Take Statement

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), 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.

The measures described below are non-discretionary, and must be undertaken by Reclamation in order for the exemption in section 7(o)(2) to apply. Reclamation has a continuing duty to regulate the activity covered by this incidental take statement. If Reclamation (1) fails to assume and implement the terms and conditions or fails to require the contractors to adhere to the terms and conditions of the incidental take statement, for example, through enforceable terms that are added to any permit, grant, or contract document, or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, Reclamation 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)].

Sections 7(b)(4) and 7(o)(2) of the ESA, which refer to terms and conditions and exemptions on taking listed fish and wildlife species, do not apply to listed plant species. However, section 9(a)(2) of the ESA prohibits removal, reduction to possession, and malicious damage or destruction of listed plant species from areas under Federal jurisdiction, as well as any act that would remove, cut, dig up, or damage or destroy any such species on any area in knowing violation of any State law or regulation, including the California Endangered Species Act, or in the course of any violation of a State criminal trespass law. Actions funded, authorized or implemented by a Federal agency that could incidentally result in the damage or destruction of such species on Federal lands are not a violation of the Act, provided the Service determines in a biological opinion that the actions are not likely to jeopardize the continued existence of the species.

Amount or Extent of Take

Implementation of the terms and conditions in this biological opinion and in the Interim opinions of 1995 and 2000, the Friant opinion of 2001, the Grassland Bypass opinion of 2001, and the CVPIA opinion of 2000 are expected to substantially reduce, but not eliminate, the potential for incidental take of listed species resulting from the renewal of 42 Interim water contracts.

The Service anticipates incidental take of fish and wildlife species listed in Table 1A as a result of Interim renewal contracts for the period of March 1, 2002 through February 28, 2004. Take is authorized within the 41 contract service areas considered in this opinion (excluding the El Dorado Irrigation District contract for Lake Hills Estates) on lands within cultivation since 1995 or that Reclamation or the Interim contractors have otherwise demonstrated compliance with the ESA. We anticipate that listed wildlife will be harassed, injured, or killed over two years by normal farming practice, as described below, on existing irrigated lands irrigated with CVP water in the action area, would be taken as a result of the proposed action. Normal farming practice means activities typical of agricultural production, except pesticide use, on similar crop types from year to year (such as annual row crops), not intended to harm listed wildlife species or degrade habitat. Excluded from normal farming practice for the purposes of this incidental take statement are the following conversions: from irrigated pasture to any other type of irrigated agriculture or M&I use; from orchards or vineyards to row crops or M&I use; from non-irrigated habitat useful to listed species to agriculture, M&I use, or plowed, disced or graded land; or from land four or more years fallow that is useful to listed species to active agriculture, M&I use, or plowed, disced or graded land. Take resulting from pesticide use is not covered by this incidental take statement, because consultation on pesticide registration is not within Reclamation's jurisdiction.

In addition, the Service anticipates take due to selenium contamination in giant garter snakes and Sacramento splittail, as follows:

Giant Garter Snake. The Service expects that incidental take of giant garter snakes will be difficult to quantify for the following reasons: (1) the snakes are secretive and sensitive to human activities, (2) the difficulty of finding a dead or injured snake, (3) natural fluctuations in abundance may mask project effects, and (4) selenium contamination effects on giant garter may be sublethal and laborious to quantify. According to Service policy, as stated in the Endangered Species Consultation Handbook (March 1998) (Handbook), some detectable measure of effect should be provided, such as the relative occurrence of the species or a surrogate species in the local community, or amount of habitat utilized by the species, to serve as a measure for take. Take also may be expressed as a change in habitat characteristics affecting the species, such as water quality or flow (Handbook, p. 4-47 to 4-48).

For these reasons, the Service is estimating the level of take as injury to all giant garter snakes present from March 1, 2002 to March 31, 2002, in the Grassland wetland supply channels, resulting from transient food chain exposure to waterborne selenium concentrations above two parts per billion (2 ppb) caused in whole or in part by loading of selenium into the DMC under the discretion of Reclamation. Take resulting from exceedence of a monthly mean selenium concentration of 2 ppb in the Grassland wetland supply channels is not authorized. This 30-day incidental take coverage will allow Reclamation time to develop a short-term plan to address selenium loading from the Firebaugh sumps and perhaps other sources, into Grassland wetland source waters from the Delta Mendota Canal.

Sacramento Splittail. The Service expects that incidental take of Sacramento splittail will be difficult to quantify for the following reasons: (1) the aquatic nature of the fish make injury and mortality difficult to observe, (2) natural fluctuations in abundance may mask project effects, and (3) selenium contamination effects on splittail may be sublethal and difficult to measure. Take also may be expressed as a change in habitat characteristics affecting the species, such as water quality or flow (Handbook, p. 4-47 to 4-48).

For these reasons, the Service is estimating the level of take as injury to all Sacramento splittail present, from March 1, 2002 to March 31, 2002, downstream of the San Joaquin River, resulting from transient food chain exposure to waterborne selenium concentrations above two parts per billion (2 ppb) caused in whole or in part by loading of selenium into the DMC under the discretion of Reclamation. The preceeding notwithstanding, no take is authorized that results from selenium loads exiting the Grassland Bypass Project in excess of the approved Grassland Bypass project load schedule.

Upon implementation of the following reasonable and prudent measures, Reclamation will become exempt from the prohibitions described under section 9 of the ESA for the species, forms of take, and areas described in this section. This exemption does not extend to forms of take other than those described in this opinion. Individual users of the Federal water not explicitly exempted from section 9 of the ESA under this incidental take statement may seek incidental take authorization through the section10(a)1(B) permit process or by separate section 7 consultation.

Effect of the Take

The Service has determined in the accompanying amendment to the Interim water contracts biological opinion that this level of anticipated take is not likely to result in jeopardy to the species.

Interim Biological Opinion, February 27, 2002
Regional Director, Mid-Pacific Region, U.S. Bureau of Reclamation

Reasonable and Prudent Measures

The reasonable and prudent measures below are added to the reasonable and prudent measures set forth in the Interim opinion of 2000. The reasonable and prudent measures in the Interim opinion of 2000 remain in effect. The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the direct and indirect impacts on listed fish and wildlife species of the incidental take described in this biological opinion.

I. Reclamation will comply with conservation measures and non-discretionary terms and conditions in applicable biological opinions.

II. Reclamation and the Interim Contractors will develop and implement a program to compensate for any losses of listed species habitat that occur as a result of delivery of Central Valley Project water to Interim contract service areas.

III. Reclamation and Santa Clara Valley Water District will establish and implement interim conservation measures to protect listed species and their habitats in Santa Clara County until an approved HCP is implemented.

IV. Reclamation will identify land and water use techniques or measures within CVP service areas that are critically impacting listed and proposed species or their habitats.

Terms and Conditions

The terms and conditions below are added to the terms and conditions set forth in the Interim opinion of 2000. Any terms and conditions in the Interim opinion of 2000 that have not been fully discharged remain in effect. In order to be exempt from the prohibitions of section 9 of ESA, Reclamation must comply with the following terms and conditions, which implement the reasonable and prudent measures above and outline required reporting/monitoring requirements. These terms and conditions are nondiscretionary.

I. Reclamation will implement in a timely manner relevant environmental commitments, mitigation and conservation measures, and terms and conditions from other biological opinions issued to Reclamation and overlapping the Interim action area, including but not limited to: the 2000 Interim Opinion (February 29, 2000, file 1-1-00-F-0056), Implementation of the CVPIA and Continued Operation and Maintenance of the CVP (November 21, 2000, file 1-1-98-F-0124), Friant Long Term Contract Renewals (January 19, 2001, file 1-1-01-F-0027) and the Grassland Bypass Project (September 27, 2001, file 1-1-01-0153).

II. Reclamation and the Interim Contractors will develop and implement a program to compensate for any losses of listed species habitat that occur as a consequence of Interim contracts:

A. Reclamation and the Interim contractors will establish a contingency plan(s) that specify a process to identify impacts and then address those impacts to listed species or their habitats since 1993 within the Interim contract service areas. The plan will include reporting results of impact identification and compensation to the Service. The procedure will be in place before initiating consultation on long-term contract renewals or on another Interim contract renewal.

B. Reclamation will ensure implementation of the contingency plan to address impacts to species or their habitats within the Interim contract service areas that occur without a Service incidental take authorization. Implementation will occur by long-term contract renewal execution or another Interim contract renewal, whichever comes first.

C. The contingency plan(s) for impacts to listed species or their habitat must be reviewed and approved by the Service and will incorporate compensation for temporal and other habitat losses. Losses of listed species habitat documented within the Interim contract service areas will be compensated at ratios consistent with the recovery needs for those species.

III. Reclamation and Santa Clara Valley Water District interim conservation measures:

A. As part of the ongoing Santa Clara County HCP planning process, Santa Clara Valley Water District, Reclamation, and the Service will work with Santa Clara County and other appropriate parties to create a forum to facilitate information exchange, decision-making, and implementation of listed species conservation measures. The forum will promote development and implementation of short-term conservation measures. The forum will be made up of the Santa Clara Valley Water District, Reclamation, the Service, Santa Clara County and other appropriate agencies, and will meet quarterly or more often until conservation measures are in place.

B. Reclamation and Santa Clara Valley Water District will work with Santa Clara County and other appropriate parties to ensure that interim conservation measures acceptable to the Service to protect listed species and their habitats within the District's service area are developed and implemented within one year of this biological opinion.

IV. Reclamation will identify land and water use techniques or measures within CVP service areas that are critically impacting listed and proposed species or their habitats.

A. Reclamation will develop and implement--within 30 days--short-term measures to minimize the effects of the selenium load from the Firebaugh sumps. At a minimum the measures will address actions to take to prevent selenium concentration in the DMC from contributing to exceedences of the 2 ppb monthly mean selenium standard in the Grassland wetland water supply channels. The measures implemented and their effectiveness will be reported to the Service.
B. Reclamation will develop longer-term measures to minimize take from selenium contamination in the DMC and its downstream consequences, including the operation of the Firebaugh sumps, and will incorporate these longer term measures in its proposed action in the pending CVP O&M consultation (or the South Central California Area Office O&M consultation). Sufficient information for the O&M consultation and an initiation request will be provided to the Service by August 1, 2002, to assure consultation is completed before the next winter-spring season of selenium peaks in Grassland wetland water supplies.
C. Reclamation's plan to address the selenium loading in the DMC, including the Firebaugh sump discharges, will be provided to the Service for consideration in the DMC long term contract renewal consultation (file 1-1-01-F-0309, initiated August 14, 2001, temporarily suspended until completion of this Interim consultation).
D. Reclamation will monitor and report to the Service concentrations and loads of Se from the sumps and in the DMC on at least a monthly basis, and more frequently when downstream DMC water concentrations of selenium exceed 2 ppb and remedial actions are being taken and monitored.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take on the species that might otherwise result from the proposed action. If, during the course of the action, the anticipated level of incidental take described above is exceeded, such incidental take would represent new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. 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.

Reporting Requirements

The following reporting requirement below is added to the reporting requirements set forth in the Interim opinion of 2000. The reporting requirements in the Interim opinion of 2000 remain in effect.

Within 30 days of this opinion, Reclamation shall report to the Service short-term measures Reclamation plans to implement to minimize the effects of the selenium load from the Firebaugh

sumps discharged into the DMC. Additionally, Reclamation will monitor and report to the Service concentrations and loads of Se from the sumps and in the DMC on at least a monthly basis, and more frequently when downstream DMC water concentrations of selenium exceed 2 ppb and remedial actions are being taken and monitored.

Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. The term "conservation recommendations" has been defined as suggestions from the Service regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's 7(a)(1) responsibilities for these species. In order for the Service to be kept informed of actions that either minimize or avoid adverse effects or that benefit listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

The following conservation recommendations below are added to the conservation recommendations set forth in the Interim opinion of 2000. The Service recommends that Reclamation:

1. Reclamation should take affirmative actions to offset the impacts of past and present CVP implementation and its consequences on listed species. In particular, assist the Service or other organizations in permanently conserving lands important as habitat or movement corridors for listed species.
2. Reclamation should proactively encourage and fund retirement of seleniferous agricultural lands, including but not limited to those within or adjacent to the Grassland Drainage Area. This support could take the form of land purchases, incentives for withdrawing such lands from irrigation, disincentives for applying Federal water, reclassifying seleniferous lands, et cetera, and should be pursued by Reclamation whether independently or in cooperation with other appropriate Federal, State, and local agencies.
3. Reclamation should reallocate Central Valley Project water from retired lands to meet listed species water supply needs.
4. Reclamation should assist the Service in the implementation of recovery actions in the Draft Recovery Plan for California red-legged frog (USFWS, 2000), Draft Recovery Plan for the Giant Garter Snake (USFWS, 1999), Draft Recovery Plan for gabbro soil plants of the Central Sierra Nevada foothills (USFWS, December 1998), Recovery Plan for serpentine soil species of the San Francisco Bay Area (USFWS, September 1998a), Recovery Plan for Upland Species in the San Joaquin Valley (USFWS, September

1998b), Draft Recovery Plan for the least Bell's vireo (USFWS, 1998), Recovery Plan for the large-flowered fiddleneck (USFWS,1997), Recovery Plan for the Sacramento/San Joaquin Delta Native Fishes (USFWS,1995), and Recovery Plan for valley elderberry longhorn beetle (USFWS, 1984).

5. Reclamation should assist the Service and other relevant parties in implementation of recommended actions to reduce the extent and severity of drainwater contamination identified in the San Joaquin Valley Drainage Program's Final Report: A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley.
6. Reclamation and the Interim contractors should provide education to their staff(s) on identifying and protecting listed species in the project area.
7. Reclamation should provide outreach to the public and to schools on protecting listed species.

In order 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–Closing Statement

This concludes formal consultation on the proposed 2002-2004 Interim water contracts. 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 maintained (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 agency action is subsequently modified in a manner that causes an effect to the 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.

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Appendix A.
Interim Renewal Contracts
Central Valley Project
March 1, 2002-February 29, 2004

Division/Unit/Contractor	Existing Contract Number	Contract Quantity (acre-feet)	Authorized Water Use	
			Agricultural	Municipal & Industrial
American River Division				
San Juan Water District	14-06-200-152A-IR4	11,200		X
El Dorado Irrigation District	14-06-200-949-IR4	23,000	X	X
El Dorado Irrigation District	14-06-200-7312-IR5	50		X
Cross Valley Canal				
* Fresno, County of	14-06-200-8292A-IR4	3,000	X	X
* Hills Valley Irrigation District	14-06-200-8466A-IR4	3,346	X	X
* Kern-Tulare Irrigation District	14-06-200-8601A-IR4	40,000	X	X
* Lower Tule River Irrigation District	14-06-200-8237A-IR4	31,102	X	X
* Pixley Irrigation District	14-06-200-8238A-IR4	31,102	X	X
* Rag Gulch Water District	14-06-200-8367A-IR4	13,300	X	X
* Tri-Valley Water District	14-06-200-8565A-IR4	1,142	X	X
* Tulare, County of	14-06-200-8293A-IR4	5,308	X	X
Delta Division/Delta-Mendota Canal				
Banta-Carbona Irrigation District	14-06-200-4305A-IR4	25,000	X	X
Broadview Water District	14-06-200-8092-IR4	27,000	X	X
Centinella Water District	7-07-20-W0055-IR4	2,500	X	X
Del Puerto Water District	14-06-200-922-IR6	140,210	X	X
Eagle Field Water District	14-06-200-7754-IR4	4,550	X	X
Laguna Water District	2-07-20-W0266-IR4	800	X	X
Mercy Springs Water District	14-06-200-3365A-IR4A	7,040	X	X
Oro Loma Water District	14-06-200-7823-IR4	4,600	X	X
Patterson Water District	14-06-200-3598A-IR4	16,500	X	X
Plain View Water District	14-06-200-785-IR6	20,600	X	X
West Side Irrigation District, The	7-07-20-W0045-IR4	7,500	X	X
West Stanislaus Irrigation District	14-06-200-1072-IR6	50,000	X	
Widren Water District	14-06-200-8018-IR4	2,990	X	X

* These contracts were included in the January 19, 2001 Fish and Wildlife Service biological opinion for Friant Division and Cross Valley Unit long-term contract renewals.

Appendix A. (Continued)
Interim Renewal Contracts
Central Valley Project
March 1, 2002-February 29, 2004

Division/Unit/Contractor*	Existing Contract Number	Contract Quantity (acre-feet)	Authorized Water Use	
			Agricultural	Municipal & Industrial
Sacramento River Division/Corning Canal				
Corning Water District	14-06-200-6575-IR4	23,000	X	X
Proberta Water District	14-06-200-7311-IR4	3,500	X	X
Thomes Creek Water District	14-06-200-5721A-IR4	6,400	X	X
Sacramento River Division				
Feather Water District	14-06-200-171A-IR5	20,000	X	
Sacramento River Division/ Tehama-Colusa Canal				
Colusa County Water District	14-06-200-304-A-IR4	62,200	X	X
Colusa, County of	14-06-200-8310A-IR4	See Subcontractors below		
Four-M Water District		5,700	X	X
Glenn Valley Water District		1,730	X	X
Holthouse Water District		2,450	X	X
Myers Marsh Mutual Water Company		255	X	X
LaGrande Water District		2,200	X	X
Cortina Water District		1,700	X	X
WestsIrrigation Districte Water District		40,000	X	X
Colusa County Water District		5,965	X	X
Davis Water District	14-06-200-6001A-IR4	4,000	X	X
Dunnigan Water District	14-06-200-399A-IR4	19,000	X	X
Glide Water District	7-07-20-W0040-IR4	10,500	X	X
Kanawha Water District	14-06-200-466-A-IR4	45,000	X	X
Kirkwood Water District	7-07-20-W0056-IR4	2,100	X	X
La Grande Water District	7-07-20-W0022-IR4	5,000	X	X
Orland-Artois Water District	14-06-200-8382A-IR4	53,000	X	X
Westside Water District	14-06-200-8222-IR4	25,000	X	X
Shasta Division				
Shasta Lake, City of	4-07-20-W1134-IR6	2,750		X
Trinity Division				
Bella Vista Water District	14-06-200-851-A-IR5	24,000	X	X
Clear Creek CSD	14-06-200-489-A-IR5	15,300	X	X