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:
81420-2008-I- 0943-1

MAY 29 2009

Memorandum

To: Chief, Resources Management Division, Bureau of Reclamation, South-Central California Area Office

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

Subject: Proposed Partial Assignment of Class I and Class II Water from Ivanhoe Irrigation District to Kaweah Delta Water Conservation District, and making Kaweah Delta Water Conservation District a Friant Division Central Valley Project Contractor.

This document transmits the Fish and Wildlife Service's (Service) findings based on our review of the proposed partial assignment of a long-term contract for Friant Division Central Valley Project (CVP) water from Ivanhoe Irrigation District (IID) to Kaweah Delta Water Conservation District (KDWCD); the inclusion of KDWCD as a CVP contractor (Proposed Action); and the evaluation of the effects of the proposed action on vernal pool critical habitat. We received your December 13, 2007 request for consultation on December 14, 2007. We have reviewed the information provided and it supports your determination that the proposed partial assignment of 1,200 acre-feet per year of Class I water and 7,400 acre-feet per year of Class II water from IID's Friant CVP water service contract to KDWCD will have no effect on San Joaquin Valley adobe sunburst (*Pseudobahia peirsonii*), Conservancy fairy shrimp (*Branchinecta conservatio*), California red-legged frog (*Rana aurora draytonii*), blunt-nosed leopard lizard (*Gambelia sila*), giant garter snake (*Thamnophis gigas*), California condor (*Gymnogyps californianus*), Fresno kangaroo rat (*Dipodomys nitratoides exilis*), and giant kangaroo rat (*Dipodomys ingens*)

**Project Description**

The project consists of the partial assignment of 1,200 acre-feet per year of Class I water and 7,400 acre-feet per year of Class II water from the IID Friant Division Central Valley Project (Friant CVP) water service contract to KDWCD. Approval of the partial contract assignment would make KDWCD a long-term Friant CVP Contractor and would mean that the water assigned under the contract would now be delivered to the KDWCD service area for CVP water.

TAKE PRIDE IN AMERICA

In exchange for the partial assignment, IID and KDWCD have agreed to the following, which are not a part of Reclamation's proposed action, but which must be analyzed to incorporate the KDWCD into the Friant Division of the Central Valley Project.

KDWCD would assign 2,500 acre feet of storage space in the Kaweah Reservoir to IID.

- KDWCD would assign ownership of its water supply from the Long's Canal Company diversion right (Longs Right) to IID.
- A cash payment of $450,000 would be made by KDWCD to IID.
- KDWCD would permanently assume IID's rights and obligations for that portion of the contract assigned, and Reclamation would be contractually obligated to provide to KDWCD that portion of CVP water that would have otherwise been delivered to IID. These obligations include commitments from the January 19, 2001 Biological Opinion (l-1-01-F-0027) on U.S. Bureau of Reclamation Long Term Contract Renewal of Friant Division and Cross Valley Unit Contracts. By assuming these obligations, KDWCD becomes a CVP contractor.

The partial contract assignment would reduce the quantity of Friant CVP contract water under the current IID contract delivered to IID. Land in IID would continue to be farmed using the remaining CVP water and other water supplies available to IID, including supplies generated in exchange for the proposed partial assignment.

KDWCD would use the assigned CVP water within their district to address existing groundwater overdraft issues within the Kaweah River Basin by delivering the water for direct groundwater recharge, or deliver to water service customers within the district as a substitute to groundwater pumping. See Figure 1 for an overview of the Action Area.

This response has been prepared in accordance in accordance with section 7 of the Endangered Species Act (ESA) (16 U.S.C. 1531 *et seq.*), as amended and the proposed action is in accordance with section 3404(c) of the Central Valley Project Improvement Act (CVPIA) and our November 2000 Programmatic Biological Opinion (BO) on Implementation of the CVPIA and Continued Operation and Maintenance of the CVP (Service File No. 1-1-98-F-0124).

Conservation Measures

In their Environmental Assessment (EA), and Biological Assessment (BA), Reclamation restated their concurrence with the position included in our November 2000 Programmatic BO (1-1-98-F-0124); that CVP waters delivered as a result of this proposed action are contractually prohibited from being applied to, or used to convert farm lands which have not been cultivated within the past three years, native or natural lands, including designated critical habitat, without appropriate environmental review, including compliance with ESA through either section 7 or section 10.

To assure that the proposed action is not likely to adversely affect listed species, or their critical habitat, CVP water can only be applied to native lands if:

1. A Service-approved programmatic land management opinion is in place providing protection to listed and proposed species, or after:

2. A site-specific survey for threatened and endangered species has been completed by a Service-approved biologist and submitted to the Service, and

3. A section 7 or section 10 consultation on the effect of cultivating the area has been completed when indicated by the results of the survey.

Native lands in this context means land that have been fallow and untilled for three years or more, or that have never been placed into agricultural production.

The proposed action will minimize the conversion of habitats of listed species through restricting the delivery of Federal water that might allow conversion of remaining listed species' habitats within the Action Area, and restrict the annexation of natural lands into the participating districts.

In their BA and EA, Reclamation also stated that their intent is for irrigation activities not to affect the presence of threatened or endangered species and that previously untilled land must not be tilled and put into agricultural production using Section 215 water; and that Section 215 water will not be applied to grassland or shrub land that has never been plowed or irrigated. In addition, if the land has been fallow for three consecutive years or more, it must be inspected for listed species prior to contract approval.

Reclamation also stated that they will continue to ensure that no Section 215 water delivery will be authorized if it will have a significant adverse impact on the ability to meet fish and wildlife obligations under the CVPIA. The availability of Section 215 water will be based on consideration of many operational requirements, including inflow to reservoirs, downstream capacity, and maintaining in-stream flows. The delivery of Section 215 water will not interfere with Reclamation's obligations to deliver water to wildlife refuges within the Action Area.

**Definition of the Action Area**

The Action Area includes all areas directly or indirectly affected by the Federal action and not merely the immediate areas involved in the action (50 C.F.R. §402.02).

The following areas, covering portions of Fresno, Kings, Madera, and Tulare counties, would be affected by the proposed action:

IID, located in northwestern Tulare County, as well as a two-mile buffer around IID;

KDWCD, located in northwestern Tulare and northeastern Kings counties, including the Long's Canal area, as well as a two-mile buffer around KDWCD

Lake Kaweah, located in Tulare County;

Reaches of the Kaweah River upstream from KDWCD and IID, and downstream from Lake Kaweah, located in Tulare County;

Reaches of the St. Johns River upstream from Long's Canal, located in Tulare County;

Millerton Lake, located in Fresno and Madera counties; and

The Friant-Kern Canal (FKC), between Millerton Lake and the Kaweah River, located in Fresno and Tulare counties.

**Determinations of "No Effect"**

Information contained in Reclamation's BA and EA indicates that a total of seventeen federally protected, threatened or endangered species may occur in the Action Area (see Table 1); and of that total, nine of these species have designated critical habitat either in or adjacent to the project footprint. We have reviewed the information provided in your December 13, 2007 memorandum, the accompanying BA for the Partial Assignment of the CVP Contract from Ivanhoe Irrigation District to Kaweah Delta Water Conservation District, supplemental information provided by your office and by Reclamation's Mid-Pacific Region, including Federal and State GIS data, information gathered during site visits, and other information available to us, and it supports your determination that the proposed partial assignment of 1,200 acre-feet per year of Class I water and 7,400 acre-feet per year of Class II water from IID's Friant CVP water service contract to KDWCD will have no effect on San Joaquin Valley adobe sunburst (*Pseudobahia peirsonii*), Conservancy fairy shrimp (*Branchinecta conservatio*), California red-legged frog (*Rana aurora draytonii*), blunt-nosed leopard lizard (*Gambelia sila*), giant garter snake (*Thamnophis gigas*), California condor (*Gymnogyps californianus*), Fresno kangaroo rat (*Dipodomys nitratoides exilis*), and giant kangaroo rat (*Dipodomys ingens*).

Most of the species listed in Table 1 are not able to adapt to the highly disturbed conditions that exist in most of the Action Area and are poor colonizers. Typically, these species will not become established on land that has been fallowed for less than three years and do not occur on land that is actively being cultivated or is highly disturbed. More specific rationales for the species determined to not be affected by the proposed action are given below.

Native lands with heavy clay soils do not occur in the Action Area. Therefore, the proposed action will not affect the San Joaquin adobe sunburst.

The proposed action is not expected to affect the Conservancy fairy shrimp, because it is not believed to occur in the Action Area. There is no evidence that the Conservancy fairy shrimp occurs in the Action Area, despite the fact that vernal pool invertebrate surveys have detected other vernal pool invertebrates.

Although the valley elderberry longhorn beetle occurs in the Action Area, elderberry shrubs do not occur in cultivated fields. Riparian areas through which water would be conveyed would experience similar enough flows to the current conditions that elderberry shrubs are not likely to be adversely affected.

The California red-legged frog has most likely been extirpated from the Action Area, due to previous cultivation and related agricultural activities, and other factors. Therefore, the species is not likely to be adversely affected by the proposed action.

Habitat for the California condor within the Action Area only occurs adjacent to Lake Kaweah, where it will not be affected; any changes in lake level that may result because of the proposed action are expected to be within the normal range of fluctuations.

The Fresno and giant kangaroo rats do not occur in the Action Area and would not be affected; the Fresno kangaroo rat's range is to the north and the giant kangaroo rat does not currently (and likely did not historically) inhabit the eastern Tulare Basin.

In the absence of the proposed action, the water proposed to be assigned to KDWCD would instead continue to be delivered to IID. Therefore, the delta smelt and its critical habitat are outside of the Action Area and would not be affected. The operations of the Friant Division were included in the OCAP biological opinion (see the interrelated actions section below). Kaweah River water historically did not empty into the Sacramento-San Joaquin Delta, except possibly during some extremely wet years, when Tulare Lake became connected with the San Joaquin River. Currently, this water is diverted and used by KDWCD.

**Table 1. Threatened and Endangered Species That Occur in the Action Area.**

| Common Name | Scientific Name | Status |
|---|---|---|
| **Hoover's spurge**[1] | *Chamaesyce hooveri* | Threatened |
| **San Joaquin Valley Orcutt grass** | *Orcuttia inaequalis* | Threatened |
| San Joaquin adobe sunburst | *Pseudobahia peirsonii* | Threatened |
| Conservancy fairy shrimp | *Branchinecta conservatio* | Endangered |
| **vernal pool fairy shrimp** | *Branchinecta lynchi* | Threatened |
| **vernal pool tadpole shrimp** | *Lepidurus packardi* | Endangered |
| **valley elderberry longhorn beetle** | *Desmocerus californicus dimorphus* | Threatened |
| delta smelt | *Hypomesus transpacificus* | Threatened |
| **California tiger salamander** | *Ambystoma californiense* | Threatened |
| California red-legged frog | *Rana aurora draytonii* | Threatened |
| blunt-nosed leopard lizard | *Gambelia sila* | Endangered |
| giant garter snake | *Thamnophis gigas* | Threatened |
| **California condor** | *Gymnogyps californianus* | Endangered |
| Fresno kangaroo rat | *Dipodomys nitratoides exilis* | Endangered |
| giant kangaroo rat | *Dipodomys ingens* | Endangered |
| Tipton kangaroo rat | *Dipodomys nitratoides nitratoides* | Endangered |
| San Joaquin kit fox | *Vulpes macrotis mutica* | Endangered |

1 – Species listed in bold have designated critical habitat

Critical habitat for the valley elderberry longhorn beetle, the California red-legged frog and the Fresno kangaroo rat are located outside the Action Area and will not be affected.

California condor critical habitat does not lie within IID or KDWCD or within the two mile buffer zone around the perimeter of the two districts, so it will not be affected by the proposed action in the form of habitat conversion. Any changes in lake level that may result because of the proposed action are expected to be within the normal range of fluctuations are not expected to affect the California condor's critical habitat.

**Contemporaneous Consultations**

The Sacramento Fish and Wildlife Office (SFWO) is working with Reclamation's South-Central California Area Office (SCCAO) to accumulate the information necessary to evaluate the effects of renewing the long-term water contracts for the City of Tracy in the Delta-Mendota Canal (DMC) Unit and the San Felipe Division which includes the San Benito County Water District and the Santa Clara Valley Water District. The SFWO is also working with SCCAO to conclude the consultation on the long-term water contracts for the eight San Luis Unit (SLU) contractors. The long-term consultation will include the following contracts, which have been, or are currently being evaluated for permanent assignment to Westlands Water District (WD): Widren WD – 2,990 acre feet per year; Centinella WD – 2,500 acre feet per year; Oro Loma – 6,000 acre feet per year; and Broadview – 27,000 acre feet per year. The effects to listed species of permanently assigning this additional 38,490 acre feet per year to Westlands WD are being evaluated as part of the LTCR consultation; however the effects of the contracts for delivering CVP water to the five DMC WD's were evaluated as part of the consultation for the DMC Unit.

*Friant Division*

The Friant Division consists of three units having a total of forty-one water districts; the Cross Valley Unit consists of eight water districts; and the Hidden and Buchannan Divisions. The consultation for the Friant and Cross Valley Division Contractors (FWS 1-1-01-F-0825) was completed on January 19, 2001. The CVP water delivery contracts for the Cross Valley Unit have never been executed and the Friant Division was the subject of on-going litigation that has challenged the validity of the biological opinions issued for these water delivery contracts.

Reclamation and the Natural Resources Defense Counsel (NRDC) *et al.* have reached a settlement on the long-standing lawsuit over the reestablishment of flows in the San Joaquin River from Friant Dam to the confluence with the Merced River.

This settlement, formally announced on September 13, 2006, is based on two goals and objectives:

1. A restored San Joaquin River with continuous flows to the Sacramento-San Joaquin River Delta and naturally reproducing populations of Chinook salmon.

2. A water management program to minimize water supply impacts to San Joaquin River water users.

The parties will work together on a series of projects to improve the river channel in order to restore and maintain healthy salmon populations. Flow restoration is to be coordinated with these channel improvements, with spring and fall run Chinook salmon populations reintroduced in approximately six years. At the same time, the Settlement limits water supply impacts to Friant Division long-term water contractors by providing for new water management measures that are to be undertaken by Reclamation. These measures include: a recirculation plan that would allow Friant Division contractors to capture water from downstream areas after it has served its 'Restoration Purpose' and the water could be delivered to the contractor using either the SWP or CVP delivery system; and the creation of a 'Recovered Water Account' which would allow participating contractors to purchase water during certain wet conditions when water is available that is not needed to meet contractual obligations or Restoration Flows.

Restoring continuous flows to the approximately 60 miles of dry river bed will take place in a phased manner. Planning, design work, and environmental reviews have already begun, and interim flows for experimental purposes will start in 2009. The flows will be increased gradually over the next several years, with salmon being re-introduced by December 31, 2012. The settlement continues in effect until 2026, with the U.S. District Court retaining jurisdiction to resolve disputes and enforce the settlement. After 2026, the court, in conjunction with the California State Water Resources Control Board, would consider any requests by the parties for changes to the restoration program. The agreement also requires that long-term Friant Division water service contracts be amended to conform the contracts to the terms of the settlement.

These projects or consultations are not considered part of the Environmental Baseline because final biological opinions have not yet been issued for them.

**Related Consultations**

The consultation history relating to the use of CVP water within the Friant Division is extensive. The Biological Opinions (BO's) resulting from these consultations have established thresholds to ensure survival and recovery of listed species, and have established, or have worked towards establishing, a baseline for the effects considered by this consultation. Records of these consultations are on file at the SFWO.

*Biological Opinion (l-1-01-F-0027) on U.S. Bureau of Reclamation Long Term Contract Renewal of Friant Division and Cross Valley Unit Contracts.* This January 19, 2001 Long-Term Contract Renewal (LTCR) Opinion was prepared by the Service in accordance with Section 7 of the ESA to address the proposed renewal by Reclamation of the long term water service contract with the Friant Division and Cross Valley Units of the CVP. The Service concluded that the renewal for 25 years of the CVP water service contract is not likely to jeopardize 34 listed species. However, contract assignments involving Friant Division or Cross Valley Unit Contractors were not analyzed by the biological opinion. The incidental take statement with the LTCR Opinion (page 6-1)

explains that separate effects determinations pursuant to section 7 and/or section 10 of the ESA are required for "Any future assignments of Central Valley Project water involving Friant Division or Cross Valley Unit Contractors." The LTCR Opinion did not address some of the species and critical habitats for vernal pool species and critical habitat for the California tiger salamander, the vernal pool fairy shrimp, and the vernal pool tadpole shrimp because their listings and critical habitat designations occurred after the LTCR Opinion was issued.

*Biological Opinion for the Friant Division Water Contract Renewals*. The October 15, 1991 Biological Opinion (1-1-91-F-22) and May 14, 1992 amendment from the Service were superseded by the 2001 Biological Opinion (1-1-01-F-0027).

*Biological Opinion on the Operations and Maintenance Program on Bureau of Reclamation Lands within the South-Central California Area Office*. The Service issued this opinion (1-1-04-F-0368), dated February 17, 2005, for routine operations and maintenance (O&M) activities on SCCAO lands in San Joaquin, Stanislaus, Merced, Madera, Fresno, Santa Clara, San Benito and Contra Costa Counties. The opinion addressed effects on the California tiger salamander, vernal pool fairy shrimp, valley elderberry longhorn beetle, blunt-nosed leopard lizard, vernal pool tadpole shrimp, San Joaquin woolly-threads, California red-legged frog, giant garter snake, San Joaquin kit fox, and proposed critical habitat for California tiger salamander and California red-legged frog. The Service concurred that the operation and maintenance of the Federally owned facilities in the San Joaquin Valley was not likely to adversely affect the Conservancy fairy shrimp, longhorn fairy shrimp, succulent owl's-clover and its critical habitat, Hoover's spurge and its critical habitat, the giant kangaroo rat, California condor, bald eagle, delta smelt, San Joaquin adobe sunburst, California clapper rail, salt marsh harvest mouse, Greene's tuctoria and its critical habitat, San Joaquin Valley Orcutt grass and its critical habitat, and critical habitat for the vernal pool fairy shrimp and vernal pool tadpole shrimp.

*Central Valley Project Operations Criteria and Plan (OCAP)*

The OCAP describes the coordinated operation of the CVP and State Water Project (SWP) by Reclamation and the California Department of Water Resources. On July 30, 2004, the Service issued biological opinion 1-1-04-F-0140, which addressed the effects of operating the CVP/SWP and delivering CVP water for renewing water contracts and other actions on the threatened delta smelt (*Hypomesus transpacificus*). On February 15, 2005, the Service issued biological opinion 1-1-05-F-0055 in response to Reclamation's November 3, 2004 request for reinitiation of formal consultation on the OCAP to address potential critical habitat issues and effects of the OCAP on delta smelt.

On April 7, 2006, NOAA Fisheries Service listed the southern distinct population segment of North American green sturgeon as threatened under the Endangered Species Act. The operators of the CVP and SWP facilities may be required to alter the releases from the dams or to change the pumping regime from the Delta to avoid affecting this species or habitat suitable for its use. Because this newly listed species had not been consulted on under Section 7 of the Act; Reclamation requested that NOAA Fisheries

consultation on OCAP be reinitiated. Because of the potential for revising the OCAP, Reclamation requested that the Service also reinitiate consultation on delta smelt. This formal request was received by the Service on July 6, 2006.

Subsequent to receiving this request for reinitiation consultation, Reclamation and the Natural Resources Defense Counsel (NRDC) *et al.* reached a settlement on the long-standing lawsuit over the reestablishment of flows in the San Joaquin River from Friant Dam to the confluence with the Merced River. See the Friant Division (below) for additional details.

As a result of the changes to the operating regime that will result from the listing of the green sturgeon and the parties reaching a settlement in the NRDC vs. Friant Water Users lawsuit, the new OCAP consultation issued on December 15, 2008 re-evaluated the effects of numerous new actions on the delta smelt and its designated critical habitat, including storage of CVP and SWP water in reservoirs, water releases from reservoirs, river operations, operation of the Federal/State diversion facilities, and the CVP/SWP export-pumping operations in and through the Delta. The OCAP consultation addresses the operation of the CVP/SWP in the Sacramento Valley, and included all commitments of the SWP and CVP, such as meeting requirements of the CVPIA PBO (USFWS 2000), the obligations contained in the Central Valley Water Quality Control Board water right permits, obligations of CVP water service contracts, Sacramento River Settlement contracts, San Joaquin exchange contracts, the Friant Settlement, and other requirements. Therefore, the December 15, 2008 OCAP BO addresses all of the aquatic effects of operating the CVP/SWP.

In contrast, the Service's consultations on the long-term water-service contract renewals addresses the diversion of water at prescribed diversion points and times for the use of that water on a specified land area (the contractors' service area). All renewal contracts, while identifying a full contract amount, recognize that the delivery of full contract amount is subject to availability of water and other obligations of the CVP (such as CVPIA and biological ESA consultation requirements). In other words, the contracts address a demand (among other demands) for CVP water and the OCAP consultation addresses how the CVP projects are operated to meet those demands. There clearly is a linkage between contract renewals and the operation of the CVP. These linkages must, and are being addressed in separate but parallel individual consultations such that all of the possible effects on listed species and designated critical habitat are being identified and consulted on.

These projects or consultations are considered part of the Environmental Baseline

OTHER CVP WATER-RELATED COMMITMENTS

In our November 2000 Programmatic Biological Opinion on Implementation of the Central Valley Project Improvement Act and Continued Operation and Maintenance of the Central Valley Project (Service File No. 1-1-98-F-0124) Reclamation and the Service agreed to establish a tracking program for water exchanges and water transfers that ensures compliance with the ESA. Reclamation will continue to ensure that no contract

will be approved if the action would have a significant adverse impact on the ability of Reclamation or the Service to meet fish and wildlife obligations under the CVPIA.

**Environmental Baseline**

Ivanhoe Irrigation District, consisting of approximately 10,890 acres, is located in northwestern Tulare County in the San Joaquin Valley (Figure 2). This area roughly corresponds to boundaries of the city of Ivanhoe, with a small, additional service area located to the immediate west of the city. IID lies within an area of the southern San Joaquin Valley that is subject to severe groundwater overdraft. The Friant Kern Canal (FKC) forms the district's eastern boundary for a distance of six miles.

IID, serving agricultural users, currently receives Class I and II waters from the Friant Division. IID entered into Contract 175r-1809 with Reclamation in September 1949 for a supplemental water supply from the FKC and for construction of a distribution system. The distribution system facilities were transferred to IID for operation and maintenance on March 1, 1956. IID's contract with Reclamation is for 7,700 acre-feet per year (af/yr) of Class I water and 7,900 af/yr of Class II water. On average, CVP deliveries from FKC represent 48 percent of the consumptive needs of IID. The balance of the consumptive need has been met by precipitation (21 percent), Kaweah River water rights (13.5 percent) and groundwater pumping (18.5 percent) (IID 2005).

Kaweah Delta Water Conservation District consists of approximately 337,862 acres in northeastern Kings and northwestern Tulare counties in the San Joaquin Valley (Figure 2). This area is roughly bounded by the cities of Hanford, Woodlake, Tulare, and Corcoran. State Highway 99, with a northwest-southeast alignment, divides KDWCD into two roughly equal halves. Agriculture is the predominant land use within the district. KDWCD, which currently relies heavily on groundwater to meet its irrigation needs, lies within an area of the southern San Joaquin Valley that is experiencing groundwater overdraft.

*Species Accounts and Status of Species in the Action Area*

Reclamation queried the California Natural Diversity Data Base (CNDDB 2006) for occurrences of special-status plants and wildlife within the USGS 7½ minute quadrangles encompassing KDWCD and IID and quadrangles adjacent to one in which at least part of one of the districts occurs (see Appendix A). The CNDDB query results, published technical literature, including the *Recovery Plan for Upland Species of the San Joaquin Valley* (USFWS 1998), the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (USFWS 2005a), aerial photographs, and local expert knowledge were used in the development of the baseline conditions and effects analysis.

**Hoover's Spurge (*Chamaesyce hooveri*). Federal Status: Threatened.** The seeds of this annual forb germinate only after water evaporates from vernal pools (Alexander and Schlising 1997). Seedling survival is reported to be low in years with below-average rainfall (Stone *et al.* 1988). Deeper pools seem to provide better habitat, due to a longer period of inundation and reduced interspecific competition (J. Stebbins 2000; Stone *et al.* 1988).

There is great temporal and spatial variation in phenology (Stone *et al.* 1988). Stanislaus County and Sacramento Valley populations flower from mid-June through October, but those in Merced and Tulare Counties flower from late May through July (Alexander and Schlising 1997). The plants set seed soon after flowering. Seeds of Hoover's spurge may remain dormant until the proper conditions allow germination. Plants have been known to be absent from vernal pools for as long as four years and then reappear (Stone *et al.* 1988). Beetles, bees and wasps, flies and butterflies and moths all have been observed visiting the flowers of Hoover's spurge (Stone *et al.* 1988; Alexander and Schlising 1997). Hoover's spurge is often associated with Greene's tuctoria and hairy Orcutt grass, but generally does not grow in the same portions of the pools as these grasses do (Stone *et al.* 1988; Alexander and Schlising 1997).

Hoover's spurge may occur on a variety of soils, ranging from clay to sandy loam. The species is usually found at northern hardpan and northern claypan vernal pools (Sawyer and Keeler-Wolf 1995). Most of the pools with Hoover's spurge in the San Joaquin Valley and Southern Sierra foothills are on neutral to alkaline soils over lime-silica cemented hardpan or claypan (Stone *et al.* 1988; Sawyer and Keeler-Wolf 1995). These pools usually are found on alluvial fans or terraces of ancient rivers. The range of this species includes Tulare, Merced, Stanislaus, Butte, Glenn and Tehama Counties. Most remaining habitat is in the northeastern Sacramento Valley.

In Tulare County, Hoover's spurge populations occur from 315 to 345 feet in elevation. Six occurrences of Hoover's spurge are documented in the 44 quadrangles queried (CNDDB 2006), none of which are located within either district. However, an extant population occurs immediately north of KDWCD. This population is presumed to occur within suitable vernal pool habitat in and immediately adjacent to the Action Area.

Vernal Pool Critical Habitat

Critical habitat was designated in 2003 (USFWS 2003b). The designation was revised in 2005 (USFWS 2005b) and species by unit designations were published in 2006 (USFWS 2006a). Approximately 257 acres of critical habitat unit 7D overlaps with KDWCD in the northern part of the district (Figure 3). Designated critical habitat occurs within one mile of the northeast boundary of IID.

The PCEs of critical habitat for Hoover's spurge are the habitat components that provide: (i) Topographic features characterized by isolated mound and intermound complex within a matrix of surrounding uplands that result in continuously, or intermittently, flowing surface water in the depressional features including swales connecting the pools described in PCE (ii), providing for dispersal and promoting hydroperiods of adequate length in the pools. (ii) Depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water or whose soils are saturated for a period long enough to promote germination, flowering, and seed production of predominantly annual native wetland species and typically exclude both native and nonnative upland plant species in all but the driest years. As these features are inundated on a seasonal basis, they do not promote the

development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands (USFWS 2005b).

**San Joaquin Valley Orcutt Grass (*Orcuttia inaequalis*). Federal Status: Threatened.** San Joaquin Valley Orcutt grass is small, tufted, semi-aquatic annual plant endemic to vernal pools. San Joaquin Valley Orcutt grass is found on alluvial fans, tabletop lava flows (Stebbins *et al.* 1995) and both low and high stream terraces (Stone *et al.* 1988). The species occurs within rolling grasslands (Crampton 1959) in northern claypan, northern hardpan and northern basalt flow vernal pools (Sawyer and Keeler-Wolf 1995).

This vernal pool species produces three types of leaves: submerged basal rosette, intermediate leaves with a submerged and a floating portion and terrestrial leaves (Keeley 1998). The plants are believed to be outcrossers (Griggs and Jain 1983). *Ocuttia* species germinate underwater in January and February (Griggs and Jain 1983; Keeley 1998). In order to germinate, the seeds have to be colonized by aquatic fungi (Griggs 1981; Keeley 1988). The plants grow underwater for three or more months (Keeley 1998). Peak flower production generally occurs in June and July and can extend into August and September in rainy years (Griggs 1981). Late-spring inundation can kill flowering plants (Silveira 1997).

San Joaquin Valley Orcutt grass has been found from 100 to 2,475 feet, with the highest elevations on tabletops in Madera and Fresno Counties (Stebbins *et al.* 1995). The species has never occurred outside of the Southern Sierra Foothills Vernal Pool Region (Keeler-Wolf *et al.* 1998). San Joaquin Valley Orcutt grass was known from Tulare, Fresno, Madera, Merced and Stanislaus Counties (Hoover 1941). By the late seventies, none of these occurrences remained (Griggs and Jain 1983). In the 1980s, several new observations were made, mostly in Merced County, but there were three in Madera County and one in Fresno County (Stone *et al.* 1988). Since 1990, six more observations were made, including one in Tulare County (Witham 2000). It is believed that the historic occurrences within the Ivanhoe and Wahtoke quadrangles have been extirpated.

Beginning in the mid-1800s, much vernal pool habitat was lost to land conversion for agriculture and for water storage and conveyance facilities (Frayer *et al.* 1989; Kreissman 1991). By 1997, it is estimated that three quarters of these habitats were lost in the Central Valley (Holland 1998). Urban development and associated activities, such as off-road activity threaten the species through loss, fragmentation and degradation of habitat, alteration of hydrology and contaminants.

Two occurrences of San Joaquin Valley Orcutt grass are documented in the quadrangles queried, one of which may be extirpated (CNDDB 2006). An extant population is located 0.6 miles north of KDWCD and 2.5 miles northwest of IID. Suitable habitat for this species occurs in vernal pools in the extreme northern portion of KDWCD. Therefore, San Joaquin Valley Orcutt grass potentially occurs within suitable habitat within the Action Area.

Vernal Pool Critical Habitat

Critical habitat was designated in 2003 (USFWS 2003b). The designation was revised in 2005 (USFWS 2005b) and species by unit designations were published in 2006 (USFWS 2006a). The PCEs of critical habitat for San Joaquin Valley Orcutt grass are the habitat components that provide: (i) Topographic features characterized by isolated mound and intermound complex within a matrix of surrounding uplands that result in continuously, or intermittently, flowing surface water in the depressional features including swales connecting the pools described in PCE (ii), providing for dispersal and promoting hydroperiods of adequate length in the pools. (ii) Depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water or whose soils are saturated for a period long enough to promote germination, flowering, and seed production of predominantly annual native wetland species and typically exclude both native and nonnative upland plant species in all but the driest years. Because these features are inundated on a seasonal basis, they do not promote the development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands (USFWS 2003a).

There are approximately 257 acres of critical habitat unit 6A that overlaps with KDWCD along the northern part of the District (Figure 3). Designated critical habitat occurs within one mile of the northeast boundary of IID.

**Vernal Pool Fairy Shrimp (*Branchinecta lynchi*). Federal Status: Threatened.** The vernal pool fairy shrimp is a member of the aquatic crustacean order Anostraca and is endemic to vernal pools in the Central valley, eastern coastal foothills from Tehama to Riverside counties, and a limited number of sites in the Transverse Range and Santa Rosa Plateau of California (Eng *et al.* 1990, Sugnet & Associates 1993, USFWS 1994b). It ranges in size from 0.4 to 1.0 inches. Vernal pool fairy shrimp rarely co-occur with other species of fairy shrimp and when they do they are rarely numerically dominant (USFWS 1994b).

The primary threats to the species are habitat loss and fragmentation due to urban development and associated infrastructure, agricultural conversion, altered hydrology, nonnative invasive species, inadequate regulatory mechanisms, exclusion of grazing in areas where grazing has been a historic land use, application of inappropriate grazing regimes (overgrazing or undergrazing), and stochastic events (USFWS 1994b). The species was listed as threatened by the USFWS in 1994 largely because of the significant threats associated with future habitat loss and fragmentation (USFWS 1994b). The State of California has not designated the species with any special status (CNDDB 2006).

Their present distribution is restricted to vernal pools within a geographic range extending from Jackson County in southern Oregon, and in California from Shasta County south through the Central Valley into Tulare County, and along the central coast range from northern Solano County south into San Benito County (USFWS 1994b). This species, however, occurs sporadically within local vernal pool complexes.

The vernal pool fairy shrimp matures rapidly which allows it to persist in pools that are filled for only a short period, but it can persist into the spring when and where pools

persist longer. The active period for this species of shrimp has been observed to extend from early December to early May (USFWS 1994b).

The shrimp play an important role in the community ecology of these pools and are themselves ecologically dependent on seasonal fluctuations in this habitat. The pools that vernal pool fairy shrimp inhabit have low conductivity, total dissolved solids, alkalinity, and chloride levels. These pools are typically clear to tea-colored and occur most commonly in grass- or mud-bottomed swales or basalt lava flow depressions in unplowed grasslands. Single populations, however, are known to occur in a sandstone rock outcrop and an alkaline vernal pool (USFWS 1994b).

The population survives through the dry summer months as diapaused eggs in the pool sediment. Depending upon the species, the resting eggs of fairy shrimp can survive freezing, heat, and prolonged desiccation. Some of these eggs will hatch when the pool fills with water in subsequent seasons, while the remaining eggs remain in the sediment. Eggs contained within the sediment at any given point can represent eggs deposited from several breeding seasons. The early stages of fairy shrimp rapidly develop into adults whose populations disappear long before the vernal pools dry up.

The CNDDB query produced 23 occurrence records for vernal pool fairy shrimp, all from populations that are presumed extant by DFG. Seven of those records are from within KDWCD. The remaining 16 records are from outside KDWCD, ranging from 0.25 to 13.2 miles from KDWCD. There are several records for the species within 10 miles of IID, but none from within the district. These local occurrences of vernal pool fairy shrimp indicate that the species continues to occur on suitable habitat within the Action Area.

Vernal Pool Critical Habitat

Critical habitat was designated in 2003 (USFWS 2003b). The designation was revised in 2005 (USFWS 2005b) and species by unit designations were published in 2006 (USFWS 2006a). Approximately 4,091 acres in the northwestern portion of KDWCD overlaps with critical habitat unit 26A. Critical habitat units 26B and 26C lay approximately 0.2 and 1.5 miles north of KDWCD, respectively, and critical habitat unit 27A is contiguous with a portion of its southern boundary (Figure 4). No designated critical habitat occurs within IID. The conservation efforts for this species include continued research and data collection, protection of existing vernal pool complexes throughout the species' range, and where possible, restoration and creation of vernal pools.

The PCEs of critical habitat for vernal pool fairy shrimp are the habitat components that provide: (i) Topographic features characterized by mounds and swales, and depressions within a matrix of surrounding uplands that result in complexes of continuously, or intermittently, flowing surface water in the swales connecting the pools described in PCE (ii), providing for dispersal and promoting hydroperiods of adequate length in the pools. (ii) Depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water for a minimum of 18 days, in all but the driest years; thereby providing adequate water for incubation, maturation, and reproduction. As these features are inundated on a seasonal

basis, they do not promote the development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands. (iii) Sources of food, expected to be detritus occurring in the pools, contributed by overland flow from the pools' watershed, or the results of biological processes within the pools themselves, such as single-celled bacteria, algae, and dead organic matter, to provide for feeding. (iv) Structure within the pools described in PCE (ii), consisting of organic and inorganic materials, such as living and dead plants from plant species adapted to seasonally inundated environments, rocks, and other inorganic debris that may be washed, blown, or otherwise transported into the pools, that provide shelter (USFWS 2005b).

**Vernal Pool Tadpole Shrimp (*Lepidurus packardi*). Federal Status: Endangered.** Vernal pool tadpole shrimp are a member of the aquatic crustacean order Notostraca. The species is endemic to ephemeral fresh water vernal pools found in California as far north as Shasta County and throughout the Central Valley as far south as Tulare County, with one population in the San Francisco Bay area on the San Francisco Bay National Wildlife Refuge in Alameda County (USFWS 1994b).

Habitat loss and fragmentation is the largest threat to the survival and recovery of vernal pool species. Habitat loss generally is a result of urbanization, agricultural conversion, and mining. Habitat loss also occurs in the form of habitat alteration and degradation as a, result of changes to natural hydrology; invasive species; incompatible grazing regimes, including insufficient grazing for prolonged periods; infrastructure projects (*e.g.*, roads, water storage and conveyance, utilities); recreational activities (*e.g.*, off-highway vehicles and hiking); erosion; climatic and environmental change; and contamination. Habitat fragmentation generally is a result of activities associated with habitat loss (*e.g.*, roads and other infrastructure projects that contribute to the isolation and fragmentation of vernal pool habitats). Vernal pool tadpole shrimp are at risk from stochastic events by virtue of the small isolated nature of many of the remaining populations (USFWS 1994b). The species was listed as endangered by the USFWS in 1994 largely because of the significant threats associated with future habitat loss and fragmentation (USFWS 1994b). The State of California has not designated the species with any special status (CNDDB 2006).

Important factors influencing their prevalence and persistence within pools include: the absence or presence of water during specific times of the year, the duration the water persists, and water chemistry that includes salinity levels, conductivity, amount of dissolved solids, and pH (USFWS 1994b). The pools inhabited typically contain clear to highly turbid water with very low conductivity, total dissolved solids, and alkalinity. Clear water pools mostly occur in grass-bottomed swales within grasslands having established alluvial soils underlain by hardpan. The turbid water habitats are associated with mud-bottomed pools.

Vernal pools form in Mediterranean climates where shallow depressions fill with rainwater during fall and winter and then dry via the evaporative process in spring. The pools usually occur as complexes because of the influences of the topography and geology of the area. A dense, interconnected mosaic of small pools or a less dense

dispersion of larger pools often represents these complexes. Percolation of the water is prevented by an impervious layer, which may be clay pan, hardpan, or a volcanic stratum.

Unlike fairy shrimp, vernal pool tadpole shrimp swim with their legs down, climb on objects, and plow through sediments on the pool bottom (USFWS 1994b). Their omnivorous diet contributes to the importance of their ecological role within vernal pool communities. Vernal pool tadpole shrimp consume detritus, earthworms, mollusks, dead tadpoles, frog eggs, fairy shrimp, and a variety of other invertebrates and microorganisms (Pennak 1989, USFWS 1994b). The vernal pool tadpole shrimp matures slowly and is long-lived so the adults are often present and reproductive until the pools dry up in spring.

Female tadpole shrimp produce up to six clutches of eggs per season, yielding more than 800 eggs in all, which are deposited on vegetation at the bottom of the pool. A portion of the eggs will hatch immediately while the rest enter diapause (dormancy). Adults remain present and reproductively active until the pools evaporate. Like fairy shrimp, the population survives through the dry summer months as diapaused eggs in the pool sediment. Some of these eggs will hatch when the pool fills with water in subsequent seasons, while the remaining eggs remain in the sediment (USFWS 1994b). Eggs contained within the sediment at any given point can represent eggs deposited from several breeding seasons. Vernal pool tadpole shrimp reach maturity 3 to 4 weeks after initial inundation of the vernal pool.

Amphibians, dytiscid beetle larvae, caddis fly larvae, and waterfowl are the chief predators of tadpole shrimp (Pennak 1989). The ability of this species to withstand disturbance most likely depends on the specific circumstances such as the nature and the intensity of the disturbance, and the amount of the original egg bank destroyed. Low to moderate levels of livestock grazing may pose no impact or benefit crustaceans in vernal pools. Overgrazing, however, is probably detrimental to vernal pool species because of the high degree of physical disturbance and likely changes in water chemistry and quality (USFWS 1994b). While waterfowl consume adults, this action may play an important role in dispersal of tadpole shrimp since viable eggs can pass through waterfowl digestive tracts and be deposited elsewhere.

The CNDDB query produced six occurrence records for vernal pool tadpole shrimp, from between 1995 and 2002. All records are from populations that are presumed extant by DFG. Three of those records are from within the northern part of KDWCD. The remaining three records were located 1.8 to 5.0 miles north of KDWCD. No occurrence of the species has been recorded within IID. Records ranged from 4.6 to 15.2 miles west or north of IID. Vernal pool tadpole shrimp are presumed to occur on suitable habitat within KDWCD.

Vernal Pool Critical Habitat

Critical habitat was designated in 2003 (USFWS 2003b). The designation was revised in 2005 (USFWS 2005b) and species by unit designations were published in 2006 (USFWS 2006a). Approximately 4,091 acres in the northwestern portion of KDWCD overlaps

with critical habitat unit 18A. Critical habitat units 18B and 18C lay approximately 0.2 and 1.5 miles north of KDWCD, respectively (Figure 4). No designated critical habitat occurs within IID.

The PCEs of critical habitat for vernal pool tadpole shrimp are the habitat components that provide: (i) Topographic features characterized by mounds and swales, and depressions within a matrix of surrounding uplands that result in complexes of continuously, or intermittently, flowing surface water in the swales connecting the pools described in PCE (ii), providing for dispersal and promoting hydroperiods of adequate length in the pools. (ii) Depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water for a minimum of 41 days, in all but the driest years; thereby providing adequate water for incubation, maturation, and reproduction. As these features are inundated on a seasonal basis, they do not promote the development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands. (iii) Sources of food, expected to be detritus occurring in the pools, contributed by overland flow from the pools' watershed, or the results of biological processes within the pools themselves, such as single-celled bacteria, algae, and dead organic matter, to provide for feeding. (iv) Structure within the pools described in PCE (ii), consisting of organic and inorganic materials, such as living and dead plants from plant species adapted to seasonally inundated environments, rocks, and other inorganic debris that may be washed, blown, or otherwise transported into the pools, that provide shelter (USFWS 2005b).

**California Tiger Salamander (*Ambystoma californiense*). Federal Status: Threatened.** On September 3, 2004, the USFWS (2004a) listed the California tiger salamander as threatened range-wide. The California tiger salamander is medium size among California salamanders with a total length up to 8.5 inches (20.7 cm). The species has disappeared from a significant portion of its range due to habitat loss attributed to agricultural practices and urbanization, and the introduction of non-native aquatic predators (*e.g.*, bluegill [*Lepomis macrochirus*], largemouth bass [*Micropterus salmoides*], mosquitofish [*Gambusia affinis*], and bullfrogs [*Rana catesbeiana*]). The California tiger salamander's current range includes the Great Central Valley of California and adjacent foothill districts as well as the coastal grasslands from the vicinity of San Francisco Bay south at least to Santa Barbara County (Morey 1988).

The California tiger salamander's preferred breeding habitat is a pond environment that persist a minimum of three to four months on an annual basis. Examples of such environments include vernal and ephemeral pools, and human-made ponds surrounded by uplands that contain small mammal burrows. The species will use permanent ponds provided that aquatic vertebrate predators are not present (Stebbins 1954). These ponds provide breeding and larval habitat while burrows excavated by small mammals such as California ground squirrels and Botta's pocket gophers support juvenile and adult salamanders in upland habitats.

The species typically breeds from early December through mid-March, resulting in larval metamorphosis and migration from the pond from late May through late July (Morrison and Van Vuren 1993). Adults occupy burrows most of the year with the exception of the winter breeding season when they migrate to breeding ponds. This migration often occurs at night during the first moderate to heavy winter rain. Newly metamorphosed juveniles from the previous summer that have not reached maturity by the breeding season presumably remain in burrows instead of migrating to ponds like adults. California tiger salamanders take several years to reach maturity and do not necessarily breed every year, even if sufficient habitat is available.

Studies on other *Ambystoma* species indicate that the dates of migration and emigration vary as a function of several factors, most importantly annual rainfall pattern, and spring and summer temperatures (Semlitsch 1983, 1985, Semlitsch and Wilbur 1988). Emigration from breeding ponds by metamorphs on the Concord Naval Weapons Station was nocturnal and concentrated between 22:00 and 01:00 (Morrison and Van Vuren. 1993). Morrison and Van Vuren (1993) reported adult salamanders moving further on their migrations out of the breeding pond than juvenile emigrants. Their data supports the hypothesis that salamanders were moving short distances each night for several days or weeks as opposed to making a single extended move. Maximum distances recorded from the center of the pond were 398.5 feet for adults and 162.4 feet for juveniles from the same pond (Morrison and Van Vuren 1993). Thus, they recommended that 398.5 feet should serve as the absolute minimum radius of protection from a breeding pond to allow for variation between sites and years, and to protect salamanders that have settled into temporary sites that are likely to be abandoned before the next migration.

The CNDDB query produced nine occurrence records for California tiger salamanders. Seven of those records are from populations that are presumed extant by DFG, and two of those are from within KDWCD. The remaining five records from populations presumed extant are from outside KDWCD and IID, but within five miles of their northern boundaries. California tiger salamanders have the potential to breed and/or estivate within suitable habitat within the Action Area.

Critical Habitat

Critical habitat was proposed on August 10, 2004 (USFWS 2004a). In August 2005, a final critical habitat designation was issued by the USFWS (USFWS 2005c). Approximately 4,091 acres in the northwestern portion of KDWCD overlaps with designated critical habitat unit 5A of the Southern San Joaquin Region (Figure 4). Units 5B and 4 of the Southern San Joaquin Region are located approximately 0.2 and 3.75 miles north of KDWCD, respectively. Designated critical habitat occurs within two miles of the northern boundary of IID.

The Central California DPS of California tiger salamander has the following PCEs: (1) Standing bodies of fresh water, including natural and man-made (*e.g.*, stock) ponds, vernal pools, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a sufficient length of time necessary for the species to complete the aquatic portion of its life cycle. (2) Barrier-free upland

habitats adjacent to breeding ponds that contain small mammal burrows, including but not limited to burrows created by the California ground squirrel and valley pocket gopher. Small mammals are essential in creating the underground habitat that adult California tiger salamanders depend upon for food, shelter, and protection from the elements and predation. (3) Upland areas between occupied locations (PCE 1) and areas with small mammal burrows (PCE 2) that allow for dispersal among such sites. (4) The geographic, topographic, and edaphic features that support aggregations or systems of hydrologically interconnected pools, swales, and other ephemeral wetlands and depressions within a matrix of surrounding uplands, which together form hydrologically and ecologically functional units called vernal pool complexes. These features contribute to the filling and drying of the vernal pool, maintain suitable periods of pool inundation for larval salamanders and their food sources, and provide breeding, feeding, and sheltering habitat for juvenile and adult salamanders and small mammals that create burrow systems essential for CTS estivation (USFWS 2004a).

**Blunt-nosed Leopard Lizard *(Gambelia sila)*. Federal Status: Endangered.** The blunt-nosed leopard lizard is a relatively large lizard of the family Iguanidae (Stebbins 1985). Adults are typically 3.4 to 4.7 inches from snout to vent and weigh between 20.6 and 37.4 grams (Tollestrup 1982, Uptain *et al.* 1985 in USFWS 1998).

The blunt-nosed leopard lizard was listed as endangered by the USFWS in 1967 and by the State of California in 1971 (USFWS 1967, 1998). The species is also Fully Protected under State law and therefore is a "no take" species. This means that DFG cannot authorize "take" in the form of capturing or killing individuals, etc. This definition of "take" does not include "harm" resulting from habitat effects, as defined under the ESA. This species is endemic to the San Joaquin Valley (Montanucci 1970, Tollestrup 1979 in USFWS 1998) and is thought to have once occurred from the Tehachapi Mountains in Kern County northward to Stanislaus County (USFWS 1998). The current range is thought to include scattered populations throughout the undeveloped land of the San Joaquin Valley and in the foothills of the Coast Range below 2,600 feet (Montanucci 1970, USFWS 1998).

The diet of the blunt-nosed lizard consists primarily of insects and other lizards (USFWS 1998). Insects consumed include grasshoppers and crickets in the Order Orthoptera and moths of the Lepidoptera. Other lizards consumed by blunt-nosed lizards include: side-blotched lizards (*Uta stansburiana*), coast horned lizards (*Phrynosoma coronatum*), California whiptails (*Cnemidophorus tigris*), and the spiny lizards (*Sceloporus spp.*) (USFWS 1998). Interspecific competition is hypothesized to occur between blunt-nosed lizards and California whiptails because they consume similar food items (Montanucci 1965, USFWS 1998).

Home ranges for male and female blunt-nosed lizards overlap, but vary in size with those of males being larger (females 0.25 to 2.7 acres, males 0.52 to 4.2 acres) (Tollestrup 1983). The lizards typically use abandoned tunnels constructed by ground squirrels and kangaroo rats, but will construct shallow, simpler tunnels when the density of small mammal burrows is low. Burrows are important structures that enable blunt-nosed lizards

to moderate temperature extremes and avoid a wide-range of predators. Taxa preying upon blunt-nosed lizards include: snakes, shrikes, hawks, owls, eagles, squirrels, skunks, badgers, coyotes, and foxes (Montanucci 1965, Tollestrup 1979).

The blunt-nosed leopard lizard inhabits open, sparsely vegetated areas within non-native grassland, Valley sink scrub, Valley needlegrass grassland, and alkali playa communities on the floor of the San Joaquin Valley (Holland 1986). The lizards also inhabit the saltbush scrub communities within the foothills of the southern San Joaquin Valley and the adjacent Carrizo Plain. These classifications by Holland (1986) are subsumed within the more general alkali desert scrub and annual grassland habitat types described by Mayer and Laudenslayer (1988). Blunt-nose leopard lizards are typically absent where habitat conditions include steep slopes, dense vegetation, or areas subject to seasonal flooding (Montanucci 1965).

Populations of the bunt-nosed leopard lizard declined to levels warranting listing because of the conversion and degradation of suitable habitat (USFWS 1998). Agricultural, urban, petroleum, mineral, and other development activities altered an estimated 94 percent of the wildlands on the Valley floor by 1985 (USFWS 1985a). The recovery plans for the blunt-nosed leopard lizard identified habitat units that were considered essential for the continued persistence of viable populations within the San Joaquin Valley, but having no legal status equivalent to critical habitat the conversion of suitable habitat within these units continued (USFWS 1980b, 1985a). Consequently, habitat disturbance, conversion, and fragmentation continue to be the greatest threats to blunt-nosed leopard lizard populations. Other direct and indirect effects result from automobile and off-highway vehicle traffic, livestock grazing, and pesticides (USFWS 1998). The recovery strategy for this species includes protecting existing habitat, determining the best habitat management practices, and conducting public information and education programs (USFWS 1985a, 1998).

The CNDDB query produced 11 occurrence records for blunt-nosed leopard lizards, recorded between 1959 and 2001. All of those records are from populations that are presumed extant by DFG, and one record from 1974 is from within KDWCD. The CNDDB query produced no occurrence record for the species within the 12-quadrangle area surrounding IID. These local records of blunt-nosed leopard lizards suggest that the species could occur within the Action Area where suitable habitat is present.

**Tipton Kangaroo Rat (*Dipodomys nitratoides nitratoides*). Federal Status: Endangered.** The Tipton kangaroo rat is one of three geographically separated subspecies of San Joaquin kangaroo rat (*Dipodomys nitratoides*), the others being the Fresno kangaroo rat (*D. nitratoides exilis*) and the short-nosed kangaroo rat (*D. nitratoides brevinasus*) (Brylski and Roest 1994, Brylski *et al.* 1994, USFWS 1998). Fresno and Tipton kangaroo rats once occupied contiguous geographic ranges within the Tulare Basin and the southeastern half of the San Joaquin Basin in the San Joaquin Valley (USFWS 1998). The short-nosed kangaroo rat inhabits the western portions of the Tulare Basin, the upper Cuyama Valley, and Carrizo Plain as well as the foothills and

basins along the west side of the San Joaquin Valley south of Los Banos in Merced County (USFWS 1998).

The Tipton kangaroo rat was listed as endangered by the USFWS in 1988 and by the State of California in 1989 (USFWS 1988). The historic distribution of the Tipton kangaroo rat covered about 1.7 million acres on the floor of the Tulare Basin. By 1985, the area inhabited had been reduced to about 63,000 acres and remains at about that level (USFWS 1998). Their present distribution is comprised of scattered, isolated populations in Tulare and Kern counties (USFWS 1998).

Seeds of annual and perennial grasses, annual forbs, and woody and semi-woody shrubs are the primary diet of the Tipton kangaroo rat (USFWS 1998). Insects comprise a small part of their diet, probably similar to that reported for Fresno kangaroo rats (Koos 1979, USFWS 1998). Tipton Kangaroo rats may have to forage on the surface for more of the year instead of relying on underground caches because damp soil conditions where they live cause seeds to sprout or mold (Culbertson 1946, Brylski *et al.* 1994).

Local population sizes are highly variable (USFWS 1998). Similar to Fresno kangaroo rats, females mature at an early age; females are capable of producing more than one litter a year; annual turnover rates can be high; and precipitation patterns most likely affect critical resources (USFWS 1998). Densities estimates for Tipton kangaroo rats vary from less than 0.4 to 35.7 rats per acre and are probably influenced by site, season, weather patterns, and intra- and interspecific competition (USFWS 1998).

Tipton kangaroo rats occupy arid-land communities on alluvial fan and floodplain soils having level or near-level topography with elevated soil structures such as mounds, berms, or embankments for burrows (Brylski *et al.* 1994, USFWS 1998). Apparently, the relictual interior dune grassland and Sierra-Tehachapi saltbush scrub communities supported the best historic populations (USFWS 1998). Iodine bush shrub land and Valley saltbush scrub are two communities occupied in present times and are typically comprised of one or more species of sparsely scattered woody shrubs and a ground cover of native and non-native grasses and forbs (USFWS 1998). Burrows are usually located in open areas. While Tipton kangaroo rats can re-colonize scattered areas of seasonally flooded habitat, areas not subject to flooding are important for permanent occupancy (USFWS 1998).

The conversion of native habitat to accommodate agricultural uses has been the leading cause of the decline in Tipton kangaroo rat populations (USFWS 1998). The CVP and SWP produced dependable supplies of water for irrigation and M&I uses. By the mid 1980's, only about three percent of the land base in the Tulare Basin was undeveloped (USFWS 1998). Use of rodenticides to control California ground squirrel populations most likely contributed to the decline in Tipton kangaroo rats. The continued conversion, degradation, and fragmentation of suitable habitat are major threats to the future persistence of this species as are periodic flooding, the use of rodenticides, and competition with Heermann's kangaroo rats that are more successful in maintaining populations in fragmented landscapes (Brylski *et al.* 1994, USFWS 1998).

Recovery efforts for this species are focused on habitat management and the protection of areas of natural or restored habitat in a configuration that will perpetuate viable populations. Other recovery actions include the design and implementation of a range-wide program to monitor the population and the expansion or continuance of studies into habitat management and interspecific competition (USFWS 1998).

The CNDDB query produced 11 records for Tipton kangaroo rats. Eight of those records are from populations that are presumed extant by DFG, one of which is from a population that straddles the western boundary of KDWCD. The remaining seven presumed extant records are from outside KDWCD, ranging from 1.6 to 13.9 miles to the south and west of KDWCD. Restricting the CNDDB query to the 12-quadrangle area surrounding IID produced no records for the Tipton kangaroo rat. The local occurrences of Tipton kangaroo rat suggest that the species could occur on suitable habitat within the Action Area.

## EFFECTS OF THE PROPOSED ACTION

### Direct Effects

Direct effects are those effects that are caused by the proposed action and occur at the time of the action. Because the proposed action is a partial contract assignment of 1,200 acre-feet per year of Class I water and 7,400 acre-feet per year of Class II water from IID to KDWCD; and KDWCD is assigning 2,500 acre feet of storage space in the Kaweah Reservoir to IID resulting in irrigation water being delivered to the existing agricultural areas in both districts there will be no change in the landscape that would result in direct effects to listed species and there will not be any adverse modification to designated and proposed critical habitat.

### Indirect Effects

Indirect effects, as defined by the ESA are those effects that are caused by the proposed action and occur later in time. These effects include effects from the partial contract assignment itself, as well as from interrelated and interdependent actions.

This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statute and the August 6, 2004, Ninth Circuit Court of Appeals decision *in Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service* (No. 03-35279) to complete the following analysis with respect to critical habitat.

The partial assignment of the contract from IID to KDWCD will make KDWCD a Friant CVP Contractor. IID will remain subject to all commitments from the Friant LTCR Opinion and KDWCD would become subject to these commitments. These commitments serve to minimize adverse effects on listed species. However, vernal pool fairy shrimp, vernal pool tadpole shrimp, and critical habitat for vernal pool species and the California tiger salamander were not addressed in the Friant LTCR Opinion.

Designated critical habitat for Hoover's spurge, San Joaquin Valley Orcutt grass, vernal pool fairy shrimp, vernal pool tadpole shrimp, and California tiger salamander occurs

within and adjacent to KDWCD. Hoover's spurge (unit 7D) and San Joaquin Valley Orcutt grass (unit 6A) share 256.5 acres of designated critical habitat within KDWCD. Vernal pool fairy shrimp (unit 26A), vernal pool tadpole shrimp (unit 18A), and the California tiger salamander (Southern San Joaquin Region unit 5A) share approximately 4,091 acres of designated critical habitat within KDWCD. Similarly, the species themselves occur in these areas (these are occupied units of critical habitat).

These native lands may also provide habitat for the San Joaquin kit fox (although records within 10 miles are lacking), the blunt-nosed leopard lizard and the Tipton kangaroo rat, although vernal pools or other seasonal wetlands would likely only be used by these species in the dry season as movement paths between areas with more suitable soils.

Specifically with regard to the current proposed action, it is not the case, as it is with Semitropic Water Storage District, that most groundwater movement is in a uniform direction. Nonetheless, native lands to the north of KDWCD could be vulnerable to land conversions that would be outside of the control of Reclamation, IID and KDWCD, although most groundwater flow does not appear to be in the direction of critical habitats (Fugro West, Inc. 2003).

Those native lands to the south may receive some groundwater flow (Fugro West, Inc. 2003). The groundwater flows that occur as a result of the proposed action may adversely affect Hoover's spurge, San Joaquin Valley Orcutt grass, vernal pool fairy shrimp, vernal pool tadpole shrimp, and California tiger salamander, critical habitats for all five of the aforementioned species, the San Joaquin kit fox, the blunt-nosed leopard lizard and the Tipton kangaroo rat.

Because the Kaweah River Basin (Basin) is in overdraft condition and KDWCD plans to enhance the groundwater resources to increase reliability and not expand groundwater extraction to facilitate the conversion of native lands within the Basin; this should minimize effects on these species and critical habitats.

Any possible effects would result from ground disturbance and habitat loss. Discing of any occupied habitat to put native lands into production could injure or kill Tipton kangaroo rats, San Joaquin kit foxes and blunt-nosed leopard lizards and their eggs. Vernal pools could be destroyed and individual shrimp, cysts, live plants or seeds could be killed. Conversion to irrigated agriculture, with regular flooding, pesticide use, ground disturbance and other common agricultural practices would permanently destroy the hardpan or claypan of vernal pools, interconnecting swales between pools that allow for dispersal, and would also create an unsuitable land type for the listed animals, or at least would reduce habitat quality for the San Joaquin kit fox.

All PCEs of California tiger salamander and vernal pool species' critical habitats could be adversely affected. For the California tiger salamander, standing bodies of fresh water, upland refugial habitat, habitat in-between bodies of fresh water and upland refugial habitat, and the features that contribute to a functional complex of vernal pools could all be affected. For vernal pool invertebrates, effects could occur on swales that interconnect vernal pools, the restrictive soil layers that create the pools and allow for incubation,

maturation and reproduction, food sources in pools, and also shelter that may occur in the pools. For vernal pool plants, the affected PCEs would be swales that interconnect pools and the restrictive soil layers that create the pools and thereby allow for germination, flowering and seed set.

**CONCLUSION**

The proposed action does not include boundary changes for either KDWCD or IID. No designated or proposed critical habitat occurs within IID. CVP water delivered as a result of the proposed action are contractually prohibited from being applied to, or used to convert farm lands which have not been cultivated within the past three years, native or natural lands, including designated critical habitat, without appropriate environmental review, including compliance with ESA through either Section 7 or Section 10. The water application criteria would prevent the application of these waters to native lands.

To assure that the proposed action is not likely to adversely affect listed species, or result in adverse modification to their designated or proposed critical habitat, CVP water can only be applied to native lands if:

1. A Service-approved programmatic land management opinion is in place providing protection to listed and proposed species, or after:

2. A site-specific survey for threatened and endangered species has been completed by a Service-approved biologist and submitted to the Service, and

3. A Section 7 or Section 10 consultation on the effect of cultivating the area has been completed when indicated by the results of the survey.

Native lands in this context means land that have been fallow and untilled for three years or more, or that have never been placed into agricultural production.

The proposed action will minimize the conversion of habitats of listed species through restricting the delivery of federal water that might allow conversion of remaining listed species' habitats within the Action Area, and restrict the annexation of natural lands into the participating districts.

Four vernal pool species and the California tiger salamander have units of designated critical habitat with portions lying outside, but within two miles of KDWCD and IID:

1) Hoover's spurge (units 7B, 7C, and 7D),
2) San Joaquin Valley Orcutt grass (units 6A and 6B),
3) Vernal pool fairy shrimp (units 26A, 26B, 26C, and 27A),
4) Vernal pool tadpole shrimp (units 18A, 18B and 18C), and
5) California tiger salamander (proposed units 5A and 5B).

Each of these units overlies the groundwater basin that would be indirectly affected by the ground water seepage under the proposed action. Likewise, the respective species occur in these areas (these are occupied units of critical habitat). These native lands may also be suitable habitat for the San Joaquin kit fox (although records within 10 miles are lacking), the blunt-nosed leopard lizard and the Tipton kangaroo rat, although vernal

pools or other seasonal wetlands would likely only be used by these species in the dry season as movement paths between areas with more suitable soils. These native areas will be protected from conversion by Reclamations commitments for protecting native lands listed above.

## REINITIATION - CLOSING STATEMENT

This concludes consultation with Reclamation on the proposed action to partially assign 1,200 acre-feet of Class I water and 7,400 acre-feet of Class II CVP water from IID to KDWCD; and to make KDWCD a long-term Friant CVP Contractor. As provided in 50 CFR 402.16, reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) new information reveals effects of the proposed action may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (2) the agency action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this opinion; or (3) a new species or critical habitat is designated that may be affected by the proposed action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending re-initiation.

### Closing

The SFWO would like to thank you and your staff for their assistance in providing information, ground-truthing, helping us better understand Reclamation's water contracting process, and commitment to working with us to conserve listed species. Please contact Mike Welsh or Susan Jones at (916) 414-6700 with questions about this biological opinion.

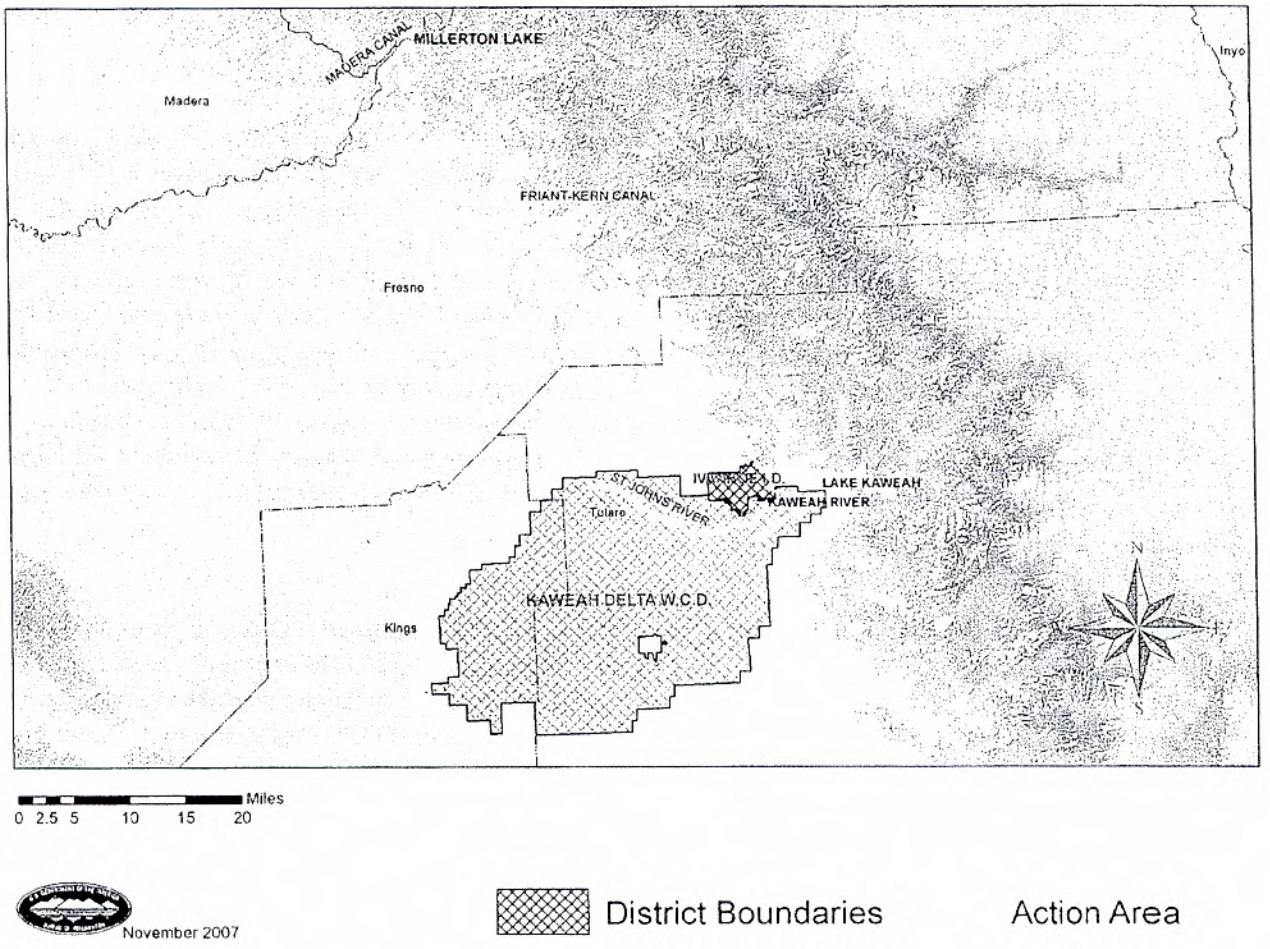


**Figure 1. Overview of the Action Area.**

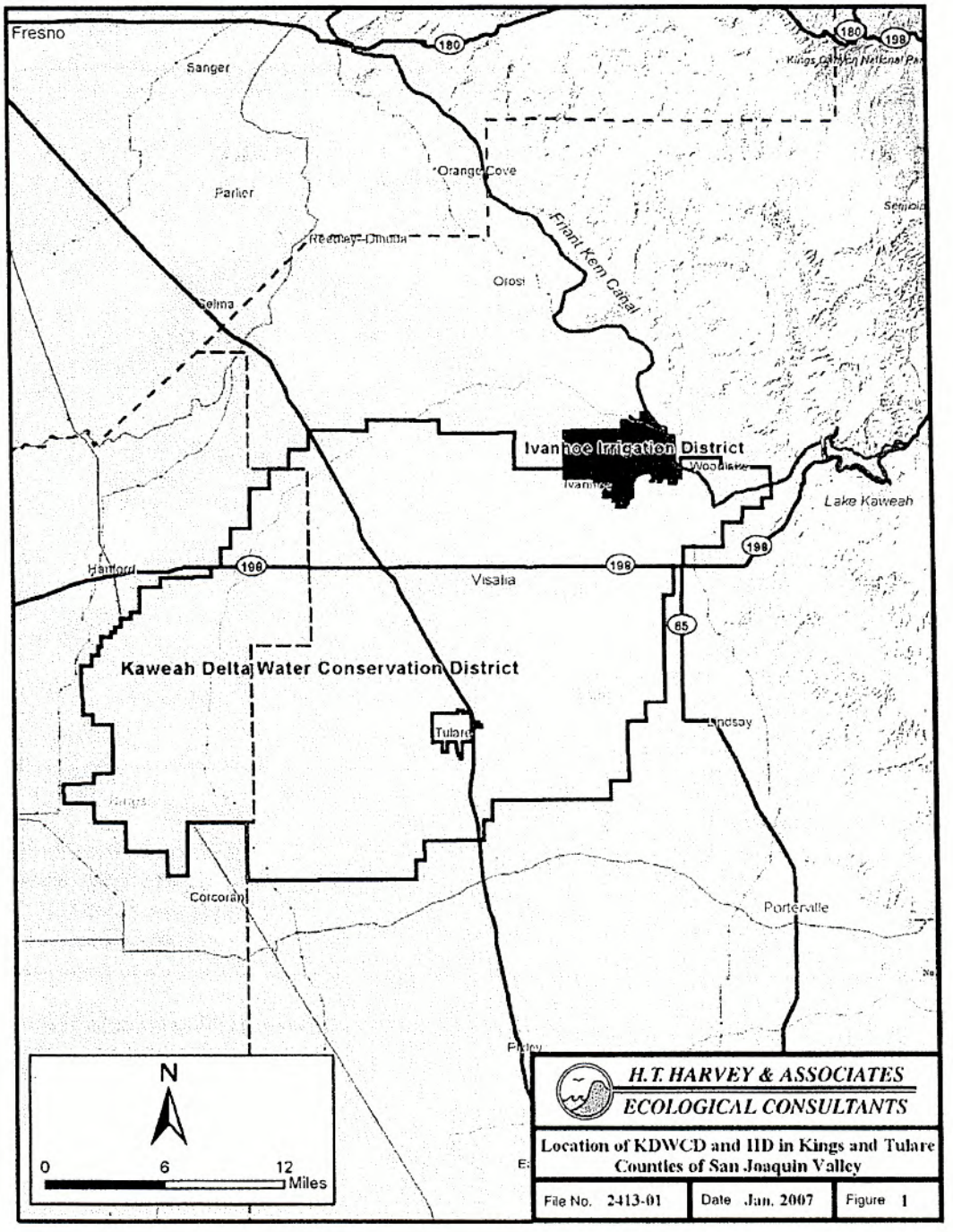


**Figure 2. Location of KDWCD and IID in Kings and Tulare Counties of the San Joaquin Valley, California.**

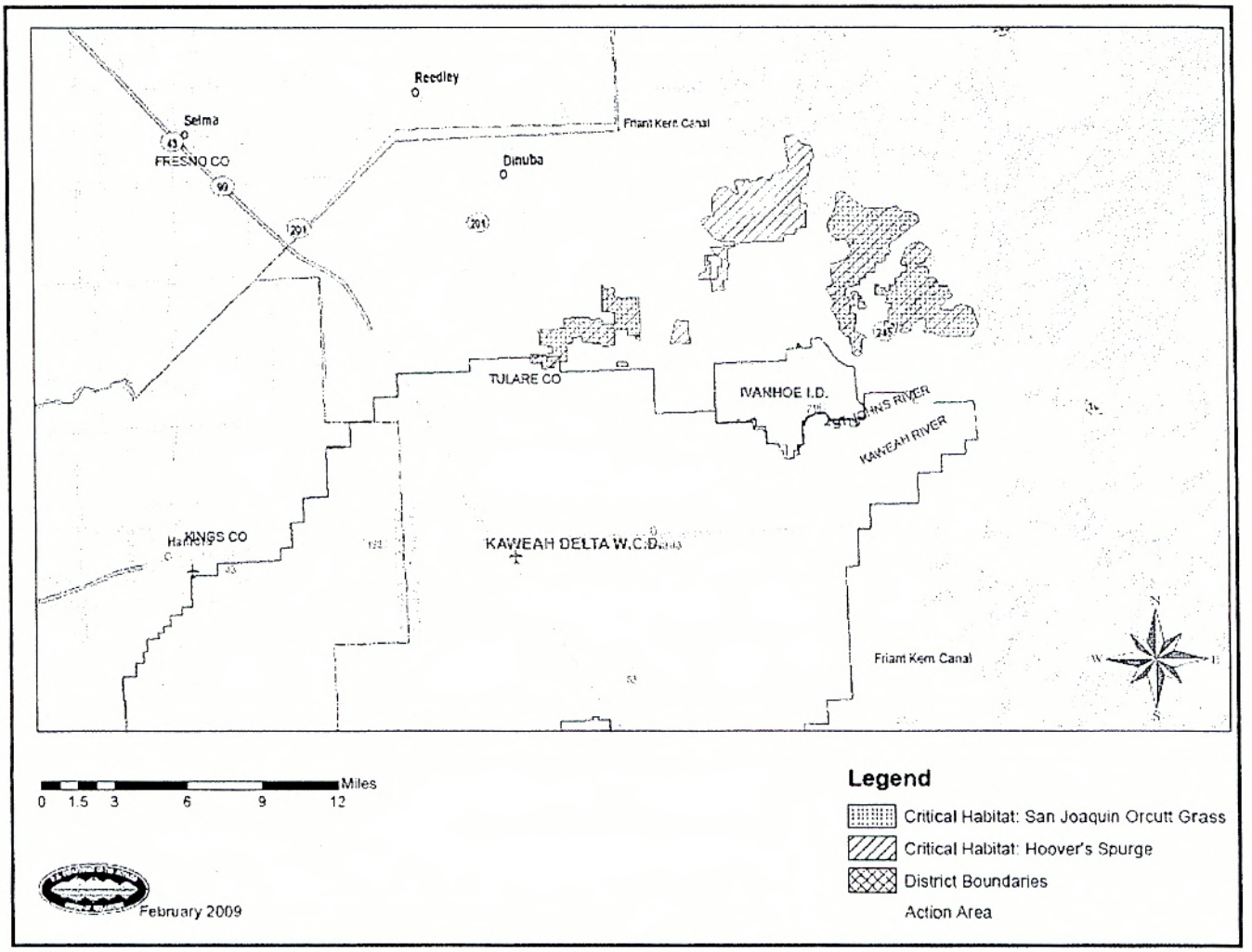


**Figure 3. Designated Critical Habitat for plants in and near KDWCD and IID.**

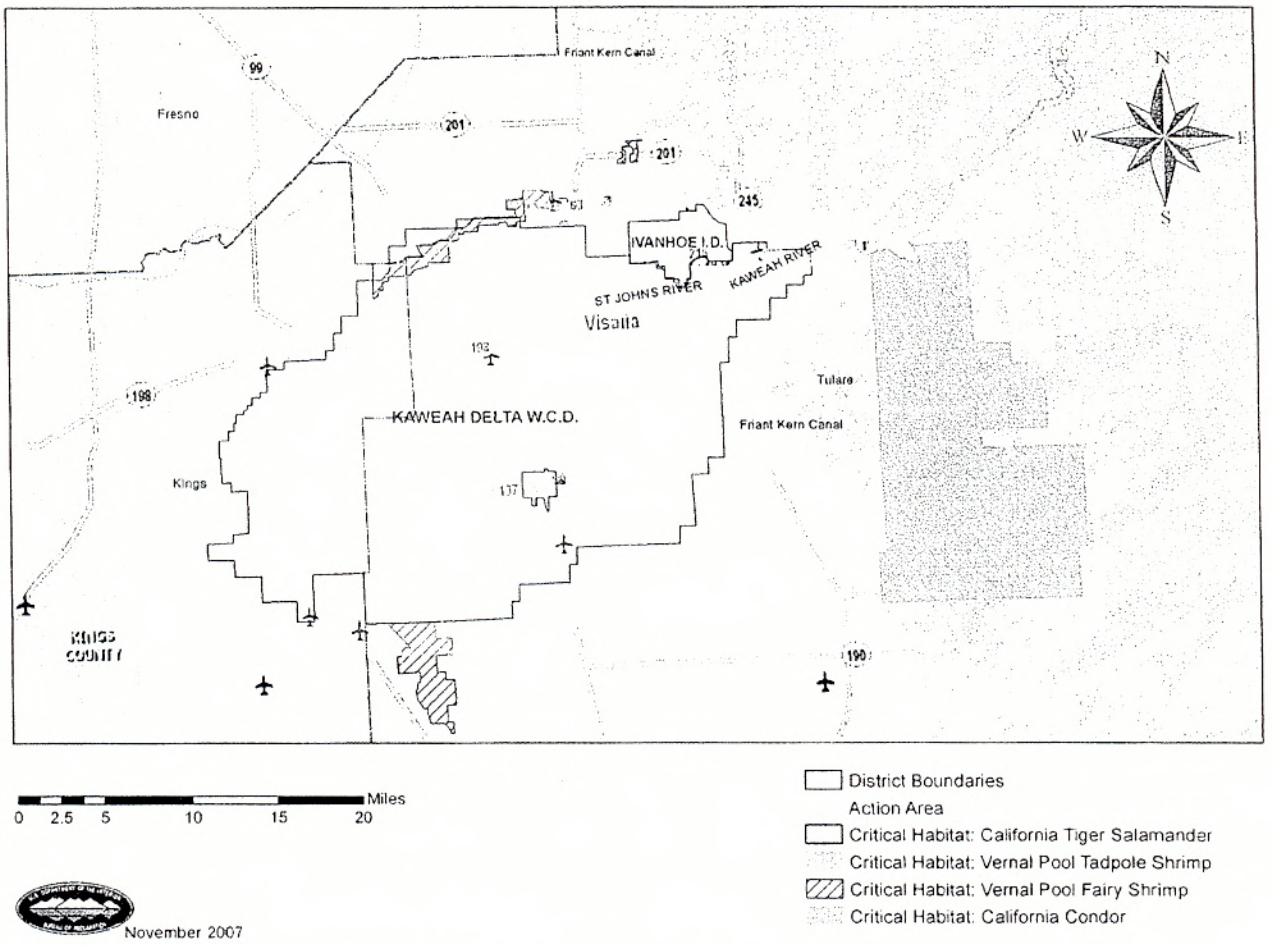


**Figure 4. Designated critical habitat for animals in and near KDWCD and IID.**