

Appendix G

Pacific Region, USFWS and ACOE,
Biological Opinion for 404 Permitted
Projects with Relatively Small Effects to
Vernal Pools, dated February 1996.

Outdated information has been corrected or deleted.

Programmatic consultation is suspended in San Joaquin Valley except where there are approved HCPs (habitat conservation plans).

U.S. Fish and Wildlife Service
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

In Reply Refer To:
1-1-96-F-1

February 28, 1996

Mr. Art Champ
Regulatory Branch
Department of the Army
U.S. Army Engineer District, Sacramento
Corps of Engineers
Sacramento, CA 95814-2922

Subject: Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Projects with Relatively Small Effects on Listed Vernal Pool Crustaceans Within the Jurisdiction of the Sacramento Field Office, California

Dear Mr. Champ:

This document serves as a programmatic formal consultation document pursuant to section 7 of the Endangered Species Act of 1973, as amended (Act), on issuance of Clean Water Act section 404 permits for projects with limited environmental impacts on vernal pools within the jurisdiction of the Sacramento Field Office (SFO) of the U.S. Fish and Wildlife Service (Service). The issues addressed in this document are the effects of these projects on the endangered Conservancy fairy shrimp (*Branchinecta conservatio*), longhorn fairy shrimp (*Branchinecta longiantenna*), vernal pool tadpole shrimp (*Lepidurus packardi*), and/or the threatened vernal pool fairy shrimp (*Branchinecta lynchi*). These animals (species) were listed on September 19, 1994 (59 **FR** 48136). This consultation document has been prepared pursuant to 50 CFR 402 of our interagency regulations governing section 7 of the Act.

The purpose of this programmatic consultation document is to expedite consultations on proposed projects with relatively small impacts on listed species. Future projects that meet the conditions specified below, or that the SFO determines will have similar impacts, may be appended to this consultation document. Contributions from the State resources agencies, U.S. Army Corps of Engineers (Corps), and U.S. Environmental Protection Agency have aided the development of this consultation document. Continued assistance of these entities in implementing its provisions will facilitate the purpose of streamlining the consultation process.

This consultation document is based on information provided in biological assessments and biological data reports submitted to the SFO by the Corps. Information obtained during site visits and meetings between members of my staff, Corps personnel, applicants, and other Federal and State entities has also been used. These meetings resulted in the development of appropriate mitigation measures that are outlined in the Description of the Proposed Action section below.

This document supersedes the Service's prior programmatic consultation document on vernal pool crustaceans dated April 4, 1995. The Service will reevaluate the effectiveness of this programmatic consultation at least every six (6) months to ensure that continued implementation will not result in unacceptable effects on the ecosystem upon which the listed species depend. This opinion may be modified during reevaluation to alleviate excessive effects on listed species or problems with the programmatic process.

BIOLOGICAL OPINION

Description of the Proposed Action

This consultation collectively covers projects with small effects on listed vernal pool crustaceans in the Sacramento Basin of California. For the purposes of this consultation, all applicants will have either surveyed habitat of these species (habitat) and confirmed the presence of listed species, or chosen to assume that all potential habitat contains listed species.

Habitat is considered to include any areas that seasonally pond water in which one or more of the listed vernal pool species could exist. Such areas include, but may not be restricted to, vernal pools and swales. Vernal pools and swales are ephemeral wetlands that typically form in shallow depressions underlain by a substrate near the surface that restricts the percolation of water. They are characterized by a barrier to overland flow that causes water to collect and pond. These depressions fill with rainwater and runoff from adjacent areas during the winter and may remain inundated until spring or early summer, sometimes filling and emptying more than once during the wet season. Vernal pools and swales are frequently clustered into assemblages known as vernal pool complexes. Individual pools within a vernal pool complex are mutually interdependent in supporting listed vernal pool species; when a species is extirpated from an individual pool, other pools in the complex may serve as recolonization sources. Upland habitat and swales around and within a vernal pool complex are essential to the hydrological and biological integrity of the complex.

All projects implemented under this programmatic consultation will meet the following conditions or will be determined by the Service to have impacts similar in nature:

1. Less than one acre of habitat will be affected, including habitat filled or otherwise destroyed (directly affected) and habitat indirectly affected by the proposed action.

Habitat indirectly affected includes all habitat supported by destroyed upland areas and swales, and all habitat otherwise damaged by loss of watershed, human intrusion, introduced species, and pollution caused by the project (see Effects of the Proposed Action below). Where the reach of these effects cannot be determined definitively, all habitat within 250 feet of proposed development may be considered to be indirectly affected. If any habitat within a vernal pool complex is destroyed, then all remaining habitat within the complex may potentially be indirectly affected. If any part of a vernal pool is destroyed, then the entire pool is directly affected.

2. Projects proposed in areas with known populations of the Conservancy fairy shrimp or longhorn fairy shrimp (in Butte, Tehama, Solano, Glenn, Merced, San Luis Obispo, and Contra Costa Counties) will not proceed until the Corps has initiated consultation and the Service has reviewed the proposed projects to ensure that impacts to these species are adequately mitigated.
3. Projects with listed or proposed plant species will undergo individual review, but, upon determination by the Service, may be included as part of this consultation.

Projects that are not consistent with these conditions may be appended to this biological opinion only as the Service deems appropriate. For example, a project that affects 5 acres of habitat, but has effects similar in scope and nature to those analyzed in this biological opinion, may be appended in the future. If the project is implemented in a manner consistent with the process described within this biological opinion, take resulting from implementation of the proposed project may be permitted.

The impacts of projects that will be authorized under this biological opinion on vernal pool species will be minimized as follows:

- A. **Preservation component.** For every acre of habitat directly or indirectly affected, at least two vernal pool credits will be dedicated within a Service-approved ecosystem preservation bank, or, based on Service evaluation of site-specific conservation values, three acres of vernal pool habitat may be preserved on the project site or on another non-bank site as approved by the Service (Table 1).
- B. **Creation component.** For every acre of habitat directly affected, at least one vernal pool creation credit will be dedicated within a Service-approved habitat mitigation bank, or, based on Service evaluation of site-specific conservation values, two acres of vernal pool habitat will be created and monitored on the project site or on another non-bank site as approved by the Service (Table 1).

Table 1. Mitigation ratios for credits dedicated in Service-approved mitigation banks or for acres of habitat outside of mitigation banks.

	bank	non-bank
preservation	2:1	3:1
creation	1:1	2:1

Mitigation ratios for non-bank mitigation may be adjusted to approach those for banks if the Service considers the conservation value of the non-bank mitigation area to approach that of Service-approved mitigation banks.

For non-natural habitat (habitat created *de novo* by human activity), habitat that is significantly altered and without restoration potential, and habitat indirectly affected by agricultural practices, mitigation may be adjusted. Certain agricultural practices have no adverse effect on vernal pool habitat and therefore may be entirely exempt from mitigation. In particular, low intensity grazing may approximately reproduce the natural conditions to which vernal pool crustaceans are adapted (i.e., prehistoric grazing by native herbivores). Consequently, such levels of grazing incur neither the creation nor the preservation component of mitigation.

- C. Vernal pool habitat and associated upland habitat used as on-site mitigation will be protected from adverse impacts and managed in perpetuity or until the Corps, the applicant, and the Service agree on a process to exchange such areas for credits within a Service-approved mitigation banking system.
- D. If habitat is avoided (preserved) on site, then a Service-approved biologist (monitor) will inspect any construction-related activities at the proposed project site to ensure that no unnecessary take of listed species or destruction of their habitat occurs. The biologist will have the authority to stop all activities that may result in such take or destruction until appropriate corrective measures have been completed. The biologist also will be required to report immediately any unauthorized impacts to the Service and the California Department of Fish and Game.
- E. Adequate fencing will be placed and maintained around any avoided (preserved) vernal pool habitat to prevent impacts from vehicles.
- F. All on-site construction personnel will receive instruction regarding the presence of listed species and the importance of avoiding impacts to these species and their habitat.
- G. The applicant will ensure that activities that are inconsistent with the maintenance of the suitability of remaining habitat and associated on-site watershed are prohibited. This includes, but is not limited to (i) alteration of existing topography or any other alteration or uses for any purposes, including the exploration for or development of mineral extraction; (ii) placement of any new structures on these parcels; (iii) dumping, burning, and/or burying of rubbish, garbage, or any other wastes or fill materials; (iv) building of

any new roads or trails; (v) killing, removal, alteration, or replacement of any existing native vegetation; (vi) placement of storm water drains; (vii) fire protection activities not required to protect existing structures at the project site; and (viii) use of pesticides or other toxic chemicals.

To ensure that incremental losses of habitat authorized by this biological opinion do not significantly hinder conservation of the ecosystem upon which listed vernal pool crustaceans depend, the following measures will be taken:

- H. Before implementation of each proposed project, the Service will be supplied with a 7.5 minute U. S. Geological Survey topographic map that clearly delineates the project area and habitat contained within this area.
- I. The Service will implement a tracking system to ensure that the total amount of listed crustacean habitat affected by projects permitted under this consultation is not so great that it jeopardizes the listed crustacean species in any county within the jurisdiction of the SFO. The Service is conducting a county-by-county survey to determine the extent of existing habitat of listed vernal pool crustaceans. Pending completion of that survey, the Service will ensure that no more than fifty [50] acres of listed crustacean habitat are filled per county, from the date of issuance of this consultation prior to completion of reinitiated formal consultation.

Limiting this programmatic consultation to projects involving relatively minor impacts will minimize effects on the listed vernal pool crustaceans and their habitat. Through the tracking of project impacts over time, effects will be further minimized at local and regional levels.

The emphasis in this programmatic biological opinion on mitigating in ecosystem mitigation banks is justified for projects that meet the conditions listed above, because generally the isolated pools and small complexes to be affected are expected to be less ecologically stable than pools that are part of the larger complexes in mitigation banks. Chance extinctions are more likely to occur in isolated pools and small complexes than in larger complexes. Such stochastic extinctions can result in lower species diversity if they are not balanced by recolonization. In addition, waterfowl are thought to be an important dispersal vehicle for cysts, especially over great distances (e.g., between vernal pool complexes). Large preserve areas are likely to be more attractive to larger numbers of these species.

The use of a habitat banking system has several additional advantages. By combining the mitigation of many applicants, an economy of scale is achieved (i.e., project mitigations have overlapping buffer zones and shared costs of monitoring; larger preserve areas that can maintain the integrity of the ecosystem, are created).

Creation and preservation areas will be established within each county. Thus, it will be assured that mitigation will occur in the same general areas as the destruction, and that local planning

efforts will have foundations for conservation planning efforts appropriate for the level of destruction that occurs during the short-term.

The option of on-site mitigation also is included in this biological opinion because of the potential importance of maintaining some remnant of the historic distribution of vernal pool clusters outside of large vernal pool mitigation banks. If these intervening "islands" of habitat are large enough and adequately protected, they may serve as "stepping stones," enabling listed species to disperse and recolonize between the major vernal pool complexes that will be preserved in banks. Such stepping stones may be especially important if wind plays a role in the dispersal of the cysts of listed crustacean species, because wind is probably only effective as a dispersal agent over short distances. An array of on-site reserves, if they are large enough to sustain populations, also may serve to maintain the full range of intraspecific genetic diversity better than reliance solely on a relatively few large reserves. A larger number of reserves also may provide better insurance against local natural disasters, disease, and predation (Simberloff and Abele 1976 and 1982; Quinn and Robinson 1987; Quinn and Hastings 1987).

The comprehensive review of the baseline (the number and location of acres destroyed within each county) that will be conducted at the end of each six-month period will limit the extent of impacts that occur as a result of the implementation of this opinion. During these reviews it may be determined that habitat destruction can continue with the same or otherwise necessary mitigation processes in place, or that further destruction in specific areas will jeopardize listed species. The Service will work closely with recovery efforts to ensure that created and preserved areas are distributed across the landscape in such a manner as to allow them to function effectively.

The following process will be used when implementing proposed projects under this biological opinion:

1. After reviewing the permit request, the Corps will forward to the Sacramento Field Office all biological and other pertinent information along with a letter requesting that the proposed project be appended to this biological opinion;
2. The Service will review the proposed project to determine appropriate mitigation.
3. The Service will deliver to the Corps a letter specifying measures that will adequately mitigate for the impacts of the proposed project (note that this could entail the approval of the applicant's proposed mitigation). Also, the Service will designate a staff biologist to serve as the contact regarding the proposed project.
4. The Corps will forward the above letter to the applicant, approving the applicant's mitigation plan, or presenting the mitigation requirements and instructing the applicant to contact the Service's staff biologist for assistance in fulfilling the applicant's mitigation responsibilities.

5. After the mitigation responsibilities are fulfilled, the Service will forward a letter to the Corps describing habitat monitoring requirements (if any) and stating that the proposed project is in compliance with requirements of the Act.

Species Accounts

Descriptions of the Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool tadpole shrimp, and the vernal pool fairy shrimp are found in 59 FR 48136, the publication of the final rule to list these species under the Act. These crustaceans are restricted to vernal pools, swales, and other seasonal pools in California. Eng *et al.* (1990) and Simovich *et al.* (1992) provide further details on the life history and ecology of the Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool tadpole shrimp, and the vernal pool fairy shrimp.

Fairy shrimp have delicate elongate bodies, large stalked compound eyes, no carapace, and 11 pairs of swimming legs. They swim or glide gracefully upside down by means of complex beating movements of the legs that pass in a wavelike, anterior-to-posterior direction. Nearly all fairy shrimp feed on algae, bacteria, protozoa, rotifers, and bits of detritus. The females carry the eggs in an oval or elongate ventral brood sac. The eggs are either dropped to the pool bottom or remain in the brood sac until the female dies and sinks. The "resting" or "summer" eggs are known as "cysts." They are capable of withstanding heat, cold, and prolonged desiccation. When the pools refill in the same or subsequent seasons, some, but not all, of the cysts may hatch. The cyst bank in the soil may comprise the cysts from several years of breeding. The cysts hatch when the vernal pools fill with rainwater. The early stages of the fairy shrimp develop rapidly into adults. These non-dormant populations often disappear early in the season long before the vernal pools dry up.

The Conservancy fairy shrimp inhabits vernal pools with highly turbid water. The species is known from six disjunct populations: Vina Plains, north of Chico, Tehama County; south of Chico, Butte County; Jepson Prairie, Solano County; Sacramento National Wildlife Refuge, Glenn County; near Haystack Mountain northeast of Merced in Merced County; and the Lockwood Valley of northern Ventura County.

The longhorn fairy shrimp inhabits clear to turbid grass-bottomed vernal pools in grasslands and clear-water pools in sandstone depressions. This species is known only from four disjunct populations along the eastern margin of the central coast range from Concord, Contra Costa County south to Soda Lake in San Luis Obispo County: the Kellogg Creek watershed, the Altamont Pass area, the western and northern boundaries of Soda Lake on the Carrizo Plain, and Kesterson National Wildlife Refuge in the San Joaquin Valley.

The vernal pool fairy shrimp inhabits vernal pools with clear to tea-colored water, most commonly in grass or mud bottomed swales, or basalt flow depression pools in unplowed grasslands. The vernal pool fairy shrimp has been collected from early December to early May. There are 32 known populations of the vernal pool fairy shrimp, extending from Stillwater Plain

in Shasta County through most of the length of the Central Valley to Pixley in Tulare County, and along the central coast range from northern Solano County to Pinnacles National Monument in San Benito County. Four additional, disjunct populations exist: one near Soda Lake in San Luis Obispo County, one in the mountain grasslands of northern Santa Barbara County, one on the Santa Rosa Plateau in Riverside County, and one near Rancho California in Riverside County.

The vernal pool tadpole shrimp has dorsal compound eyes, a large shield-like carapace that covers most of the body, and a pair of long cercopods at the end of the last abdominal segment. Tadpole shrimp climb or scramble over objects, as well as plow along or in bottom sediments. Their diet consists of organic detritus and living organisms, such as fairy shrimp and other invertebrates. The vernal pool tadpole shrimp is known from 18 populations in the Central Valley, ranging from east of Redding in Shasta County south to the San Luis National Wildlife Refuge in Merced County, and from a single vernal pool complex located on the San Francisco Bay National Wildlife Refuge in the City of Fremont, Alameda County. This animal inhabits vernal pools containing clear to highly turbid water, ranging in size from 54 square feet in the former Mather Air Force Base area of Sacramento County, to the 89-acre Olcott Lake at Jepson Prairie. The life history of the vernal pool tadpole shrimp is linked to the phenology of the vernal pool habitat. After winter rainwater fills the pools, the populations are reestablished from diapaused cysts which lie dormant in the dry pool sediments. Sexually mature adults have been observed in vernal pools three to four weeks after the pools had been filled. Some of the cysts hatch immediately and the rest enter diapause and remain in the soil to hatch during later rainy seasons.

The listed species of fairy shrimp and tadpole shrimp are imperiled by habitat loss caused by a variety of human-caused activities, primarily urban development, water supply/flood control projects, and conversion of land to agricultural use. Only a small proportion of the habitat of these species is protected from these threats. State and local laws and regulations have not been passed to protect these species, and other regulatory mechanisms necessary for the conservation of the habitat of these species have proven ineffective.

Environmental Baseline

Holland (1978) estimated that between 60 and 85 percent of the habitat that once supported vernal pools, the endemic habitat of the vernal pool fairy shrimp, had been destroyed by 1973. In the ensuing twenty-one years, a substantial amount of remaining habitat has been converted for human uses. The rate of loss of vernal pool habitat in the state has been estimated at two to three percent per year (Holland and Jain 1988). Rapid urbanization of the Central Valley of California currently poses the most severe threat to the continued existence of the listed vernal pool crustaceans. The Sacramento District of the U. S. Army Corps of Engineers has several thousand vernal pools under its jurisdiction (Coe 1988), which includes most of the known populations of these listed species. It is estimated that within 20 years 60 to 70 per cent of these will be destroyed by human activities (Coe 1988).

The habitat of the listed vernal pool crustaceans is highly fragmented throughout their ranges due to conversion of natural habitat for urban and agricultural uses. This fragmentation results in small isolated fairy shrimp populations. Ecological theory predicts that such populations will be highly susceptible to extinction due to chance events, inbreeding depression, or additional environmental disturbance (Gilpin and Soule 1986; Goodman 1987*a,b*). Should an extinction event occur in a population that has been fragmented, the opportunities for recolonization are thought to be greatly reduced due to physical (geographical) isolation from other (source) populations.

In accordance with measure I on page five of this biological opinion, the Service has been tracking losses of habitat permitted under this consultation in each county under the jurisdiction of the SFO and within the ranges of the listed crustaceans covered by this consultation. A summary of the results is displayed in Table 2 below.

Table 2. Amount of habitat of listed vernal pool crustaceans that has been permitted for fill under this programmatic consultation since its issuance on April 4, 1995, until February 14, 1996.

County	Acres of Habitat Destroyed
Shasta	0
Tehama	0
Plumas	0
Butte	0.02
Glenn	0
Colusa	0
Sutter	0
Placer	3.378
Yolo	0
Sacramento	3.9
Solano	0.55
San Joaquin	0
Contra Costa	0
Stanislaus	0

Tuolumne	0
Mariposa	0
Merced	0
Madera	0
Fresno	0
Kings	0
Tulare	0
Kern	0
San Luis Obispo	0
TOTAL	7.848

Effects of the Proposed Action

Direct effects

Individuals of listed crustaceans and their cysts may be directly injured or killed by activities leading to the destruction (i.e., the filling of habitat) of the pools in which they exist. The proposed action may directly affect all listed vernal pool crustaceans associated with up to 50 acres of habitat in each of the following counties: Shasta, Tehama, Plumas, Butte, Glenn, Colusa, Sutter, Placer, Yolo, Sacramento, Solano, San Joaquin, Contra Costa, Stanislaus, Tuolumne, Mariposa, Merced, Madera, Fresno, Kings, Tulare, Kern, and San Luis Obispo. Therefore, all listed species associated with up to a total of 1150 acres of habitat may be affected (23 counties times 50 acres per county).

Indirect effects

Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. Individuals and their cysts may be injured or killed by several indirect effects:

Changes in hydrology: In addition to the direct impacts associated with filling, development can have impacts on the hydrology of remaining habitat (e.g., pools/swales) and surrounding areas. Projects involving storm water drains, deep ripping, or the coverage of land surfaces with concrete, asphalt, or irrigated recreation parks, etc., can affect the amount and quality of water available to the perched water tables characteristic of vernal pool areas. Changes to the perched water table can lead to alterations in the rate, extent, and duration of inundation (water regime) of remaining habitat. The biota of vernal pools and swales can change when the hydrologic regime is altered (Bauder 1986, 1987). Survival of aquatic organisms like fairy shrimp is directly linked

to the water regime of their habitat (Zedler 1987). Therefore, development near vernal pool areas may, at times, result in the failure of local sub-populations of vernal pool organisms, including fairy shrimp and tadpole shrimp.

Roads: Grading for roads may affect the water regime of vernal pool habitat, particularly when grading involves cutting into the substrata in or near habitat areas. Exposure of sub-surface layers of soil at road cuts may hasten the loss of water from adjacent habitat by mass flow through networks of cracks, lenses of coarser material, animal burrows, old root channels, or other macroscopic channels. Any decrease in the duration of inundation of habitat can affect the reproductive success of species present, including the listed vernal pool crustacea. Erosion associated with road building can contaminate vernal habitat through the transport and deposition of sediments into these areas. In addition, roads or other changes in drainage patterns could result in an increase in surface runoff and conversion of vernal pool habitat.

Roads in or near the watersheds of habitat areas can lead to additional impacts through the introduction of chemically laden runoff (i.e., petroleum products) from the road surfaces. Chemical contamination of habitat can kill listed species by poisoning. Roads in close proximity to habitat areas may encourage additional impacts through other human activities.

Human intrusion: Development frequently results in human intrusion into surrounding areas. Human intrusion is a mechanism by which trash or hazardous waste can be introduced into remaining habitat areas (Bauder 1986, 1987). Disposal of waste materials can eliminate habitat, disrupt pool hydrology, or release substances into pools that are toxic or that adversely affect water chemistry. In addition, off-road vehicle use and other recreational activities associated with humans can lead to wheel ruts, soil compaction, increased siltation, destruction of native vegetation, and an alteration of pool hydrology.

Pesticides/Herbicides: Development often results in the introduction of pesticides or herbicides into the environment. These chemical compounds are thought to have adverse effects on all of the listed vernal pool crustacea and/or their cysts. Individuals may be killed directly or suffer reduced fitness through physiological stress or a reduction in their food base due to the presence of these chemicals.

Introduced predators: Development may produce conditions that are favorable for exotic predators such as bullfrogs, and mosquito fish. The stomachs of bullfrogs captured in vernal pools near Chico, California were found to contain large numbers of vernal pool tadpole shrimp (Hayes, pers. com., 1993 in 59 **FR** 48136). Mosquito fish can be equally devastating as predators when introduced into vernal pool habitat. Thus, listed species and their cysts may be adversely affected by the introduction of exotic predators.

Cumulative Effects

Cumulative effects are those impacts of future State, local, and private actions affecting endangered and threatened species that are reasonably certain to occur in the action areas. Future

Federal actions will be subject to the consultation requirements established in section 7 of the Act and, therefore, are not considered cumulative to the proposed project.

Because the Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool tadpole shrimp, and vernal pool fairy shrimp are endemic to vernal pools in the Central Valley, coast ranges, and a limited number of sites in the transverse range and Santa Rosa plateau of California, the Service anticipates that a wide range of activities will be determined to affect these species. Such activities include, but are not limited to, urban, water, flood control, highway, and utility projects, chemical contaminants, as well as conversion of vernal pools to agricultural use. Many of these activities will be reviewed under section 7 of the Act as a result of the Federal nexus provided by section 404 of the Federal Water Pollution Control Act, as amended (Clean Water Act). The Service is currently unaware of any State, local, or private actions which, when considered in conjunction with the known environmental baseline for these species, would be likely to preclude the survival and recovery of the Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool tadpole shrimp, and vernal pool fairy shrimp.

Conclusion

After reviewing the current status of the endangered longhorn fairy shrimp, Conservancy fairy shrimp, vernal pool tadpole shrimp, and the threatened vernal pool fairy shrimp; the environmental baseline for the area within the jurisdiction of the SFO; the effects of the proposed projects; and the cumulative effects; it is the Service's biological opinion that the proposed projects, as described in this consultation document, are not likely to jeopardize the continued existence of these species. Critical habitat has not been proposed for these species; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act prohibits take (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harass is defined as an intentional or negligent act that creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Incidental take is any take of listed animal species which result from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. 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 a prohibited taking provided that such taking is in compliance with this incidental take statement.

The measures described below are nondiscretionary, and must be implemented by the Corps so that they become binding conditions of any grant or permit issued to the applicant, as

appropriate, in order for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

The Service anticipates the following forms of incidental take:

1. An unknown number of adult and juvenile Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool tadpole shrimp, and vernal pool fairy shrimp per pool affected will be killed as a result of proposed projects that will destroy or modify habitat.
2. An unknown number of cysts of the Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool tadpole shrimp, and vernal pool fairy shrimp will be lost per pool affected due to changes in hydrology of habitat that will occur as a result of proposed development projects.

The proposed action may result in incidental take of all listed vernal pool crustaceans associated with up to 50 acres of habitat in each of the following counties: Shasta, Tehama, Plumas, Butte, Glenn, Colusa, Sutter, Placer, Yolo, Sacramento, Solano, San Joaquin, Contra Costa, Stanislaus, Tuolumne, Mariposa, Merced, Madera, Fresno, Kings, Tulare, Kern, and San Luis Obispo.

Effect of the Take

In the accompanying biological opinion, the Service has determined that this level of anticipated take is not likely to result in extinction or a reduction of opportunity for recovery of Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool tadpole shrimp, or vernal pool fairy shrimp.

Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize incidental take of Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool tadpole shrimp, and vernal pool fairy shrimp:

1. The impact of habitat loss to vernal pool species shall be minimized;
2. Loss of listed vernal pool crustacean habitat shall be confined to the proposed project site, and habitat and associated upland remaining on site shall be protected from adverse impacts; and,

3. The baseline condition for vernal pool species shall be adequately tracked to ensure that no more than 50 acres of habitat per county are authorized for fill under this biological opinion.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the following terms and conditions, which implement the reasonable and prudent measures described above, must be complied with.

1. To implement reasonable and prudent measure (1), mitigation measures A through C as described on pages three and four of this biological opinion shall be accomplished. These measures are hereby incorporated into these terms and conditions as requirements of the proposed projects.
2. To implement reasonable and prudent measure (2), mitigation measures D through G as described on page four of this biological opinion shall be accomplished. These measures are hereby incorporated into these terms and conditions as requirements of the proposed projects.
3. To implement reasonable and prudent measure (3), mitigation measures H and I as described on page five of this biological opinion shall be accomplished. These measures are hereby incorporated into these terms and conditions as requirements of the proposed projects.

Reporting Requirements

Any unauthorized deviation from the Description of the Proposed Action will be reported, within one working day of discovery, to the Assistant Field Supervisor at (916) 414-6600. Written notification must be made within three calendar days and include the date, time, and precise location of the event indicated on a U.S. Geological Survey 7.5 minute topographic map, and any other pertinent information. Additionally, color photographs should be taken of the specific site and provided with the notification.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act 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.

1. The Corps should work with the Service to establish functioning preserve and creation banking systems in each county to further the conservation of listed crustacean species. Such banking systems could incorporate other Corps-required mitigation (i.e., seasonal wetlands, riparian habitats, etc.);
2. As recovery plans for listed crustacean species are developed, the Corps should assist the Service in their implementation;
3. The Corps should work with the Service to ensure that its wetland delineation techniques fully assess the impacts of proposed projects on listed crustacean species; and,
4. The uppermost layer of soil in seasonally ponded habitat may contain cysts of listed crustaceans as well as seeds of vernal pool plants. Therefore, before these wetlands are filled, the top layer of soil should be made available to any vernal pool creation bank that requests it, with Service approval, for inoculating newly created pools. Soil stockpiled for this purpose or for on-site creation should be shielded from rain with a water-proof cover to ensure that it remains completely dry.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the project described in this biological opinion. As provided for 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 listed species or critical habitat that was not considered in this opinion, or (4) a new species is listed or critical habitat is 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 should cease pending reinitiation.

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