Bartel, Carlsbad Fish and Wildlife Office (see **ADDRESSES** section).

Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: January 21, 1999.

Jamie Rappaport Clark,

Director, U.S. Fish and Wildlife Service.

[FR Doc. 99–2866 Filed 2–5–99; 8:45 am]

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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018–AC26

Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Sacramento Splittail

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), determine threatened status for the Sacramento splittail (*Pogonichthys macrolepidotus*) pursuant to the Endangered Species Act of 1973, as amended (Act). Sacramento splittail occur in Suisun Bay and the San Francisco Bay-Sacramento-San Joaquin River Estuary (Estuary) in California. The Sacramento splittail has declined by 62 percent over the last 15 years. This species is primarily threatened by changes in water flows and water quality resulting from the export of water from the Sacramento and San Joaquin rivers, periodic prolonged drought, loss of shallow-water habitat, introduced aquatic species, and agricultural and industrial pollutants. Designation of critical habitat is not prudent at this time. This rule implements the protection and recovery provisions afforded by the Act for Sacramento splittail.

EFFECTIVE DATE: March 10, 1999.

ADDRESSES: The complete file for this rule is available for public inspection, by appointment, during normal business hours at the Sacramento Fish and Wildlife Office, U.S. Fish and Wildlife Service, 3310 El Camino Avenue, Suite 130, Sacramento, CA 95821–6340.

FOR FURTHER INFORMATION CONTACT: Michael Thabault, Deputy Assistant Field Supervisor, U.S. Fish and Wildlife Service (see **ADDRESSES** section) (telephone 916–979–2710).

SUPPLEMENTARY INFORMATION:

Background

As used in this rule, the term ''Delta'' refers to all tidal waters contained within the legal definition of the San Francisco Bay-Sacramento-San Joaquin River Delta, as delineated by section 12220 of the State of California's Water Code. Generally, the Delta is contained within a triangular area that extends south from the City of Sacramento to the confluence of the Stanislaus and San Joaquin rivers at the southeast corner and Chipps Island in Suisun Bay. The term ''Estuary,'' as used in this rule, refers to tidal waters contained in the Sacramento and San Joaquin rivers, the Delta, and San Pablo and San Francisco bays. ''Export facilities,'' as used in this rule, refer to the Central Valley Project and State Water Project water export facilities in the South Delta.

Sacramento splittail were first described in 1854 by W.O. Ayres as *Leuciscus macrolepidotus* and by S.F. Baird and C. Girard as *Pogonichthys inaeqilobus.* Although Ayres' species description is accepted, the species was assigned to the genus *Pogonichthys* in recognition of the distinctive characteristics exhibited by the two California splittail species *P. ciscoides* and *P. macrolepidotus* (Hopkirk 1973). *Pogonichthys ciscoides,* endemic to Clear Lake, Lake County, California, has been extinct since the early 1970s. The Sacramento splittail (hereafter splittail) represents the only existing species in its genus in California.

The name splittail refers to the distinctive tail of the fish. Pogon-ichthys means bearded fish, referring to the small barbels (whisker-like sensory organs) on the mouth of the fish, unusual in North American cyprinids. Macro-lepidotus means large-scaled. The splittail is a large cyprinid fish that can exceed 40 centimeters (cm) (16 inches (in)) in length (Moyle 1976). Adults are characterized by an elongated body, distinct nuchal hump (on the back of the neck), and small, blunt head, usually with barbels at the corners of the slightly subterminal mouth. The enlarged dorsal lobe of the caudal fin distinguishes the splittail from other minnows in the Central Valley of California. Splittail are dull, silvery-gold on the sides and olive-gray dorsally. During spawning season, pectoral, pelvic, and caudal (tail) fins are tinged with an orange-red color. Males develop small white nuptial tubercles on the head. Breeding tubercles (nodules) also appear on the base of the fins (Moyle in prep).

Splittail are native to California's Central Valley, where they were once widely distributed (Moyle 1976). Historically, splittail were found as far north as Redding on the Sacramento River (at the Battle Creek Fish Hatchery in Shasta County), as far south as the present-day site of Friant Dam on the San Joaquin River, and up the tributaries of the Sacramento River as far as the current Oroville Dam site on the Feather River and Folsom Dam site on the American River (Rutter 1908). Recreational anglers in Sacramento reported catches of 50 or more splittail per day prior to the damming of these rivers (Caywood 1974). Splittail were captured in the past in southern San Francisco Bay and at the mouth of Coyote Creek in Santa Clara County, but they are no longer present there (Moyle in prep). The species was part of the Central Valley Native American diet (Caywood 1974).

In recent times, dams and diversions have increasingly prevented splittail from upstream access to the large rivers, and the species is now restricted to a small portion of its former range (Moyle and Yoshiyama 1992). However, during wet years, they migrate up the Sacramento River as far as the Red Bluff diversion dam in Tehama County, and into the lowermost reaches of the Feather and American rivers (Moyle in prep, Jones and Stokes 1993, Charles Hanson, State Water Contractors, *in litt.* 1993). Small numbers of splittail have recently been found in the upper Sacramento and San Joaquin rivers and their tributaries (Baxter 1995). Recent surveys of San Joaquin Valley streams found splittail in the San Joaquin River below its confluence with the Merced River, mainly following wet winters (Moyle in prep). Splittail have also been recorded using the Sutter and Yolo bypasses for spawning areas during wet winters (Sommer *et al.* 1997). Successful spawning has been recorded in the lower Tuolumne River during wet years in the 1980s, as well as in 1995. Both adults and juveniles were observed at Modesto, 11 kilometers (km) (6.6 miles (mi)) upriver from the mouth of the river (Moyle in prep). However, all of the sightings reported above were during wet years when splittail were able to exploit more spawning habitat. Except for very wet years, the species is for the most part now confined to the Delta, Suisun Bay, Suisun Marsh, and Napa Marsh. In the Delta, they are most abundant in the north and west portions when populations are low, but are more evenly distributed throughout the Delta following years of successful reproduction (Sommer *et al.* 1997).

Splittail are relatively long-lived, frequently reaching 5 to 7 years of age. An analysis of hard parts of the splittail indicate that larger fish may be 8 to 10

years old (Moyle in prep). Females are highly fecund, with the largest females producing over 250,000 eggs (Daniels and Moyle 1983). Populations fluctuate annually depending on spawning success, which is highly correlated with freshwater outflow and the availability of shallow-water habitat with submerged vegetation (Daniels and Moyle 1983). Fish usually reach sexual maturity by the end of their second year. The onset of spawning is associated with rising water levels, increasing water temperatures, and increasing day length. Peak spawning occurs from the months of March through May, although records of spawning exist for late January to early July (Wang 1986). In some years, most spawning may take place within a limited period of time. For instance, in 1995, a year of extraordinarily successful spawning, most splittail spawned over a short period in April, even though larval splittail were captured from February through early July (Moyle in prep). Within each spawning season older fish reproduce first, followed by younger individuals (Caywood 1974). Spawning occurs over flooded vegetation in tidal freshwater and euryhaline habitats of estuarine marshes and sloughs and slow-moving reaches of large rivers. Larvae remain in shallow, weedy areas close to spawning sites for 10 to 14 days and move into deeper water as they mature and swimming ability increases (Wang 1986 and Sommer *et al.* 1997).

Splittail are benthic (bottom) foragers. In Suisun Marsh, they feed primarily on opossum shrimp (*Neomysis mercedis*, and presumably, the exotic *Acanthomysis* spp. as well), benthic amphipods (Corophium), and harpactacoid copepods, although detrital (non-living and detached organic) material makes up a large percentage of their stomach contents (Daniels and Moyle 1983). In the Delta, clams, crustaceans, insect larvae, and other invertebrates also are found in the diet. Predators include striped bass (*Morone saxatilis*) and other piscivores (Moyle 1976).

In recent years, splittail have been found most often in slow moving sections of rivers and sloughs and dead-end sloughs (Moyle *et al.* 1982, Daniels and Moyle 1983). Reports from the 1950s, however, mention Sacramento River spawning migrations and catches of splittail during fast tides in Suisun Bay (Caywood 1974). Because they require flooded vegetation for spawning and rearing, splittail are frequently found in areas subject to flooding. Historically, the major flood basins distributed throughout the Sacramento and San Joaquin valleys provided spawning and rearing habitat. These flood basins have all been reclaimed or modified for flood control purposes (e.g., Yolo and Sutter bypasses). Although primarily a freshwater species, splittail can tolerate salinities as high as 10 to 18 parts per thousand (ppt) (Moyle 1976, Moyle and Yoshiyama 1992). California Department of Fish and Game (CDFG) survey data from 1979 through 1994 indicate that the highest abundances occurred in shallow areas of Suisun and Grizzly bays.

Recent research indicates that splittail will use the Yolo and Sutter bypasses during the winter and spring months for foraging and spawning (Sommer *et al.* 1997). However, the Yolo Bypass may only be used by splittail during wet winters, when water from the Sacramento River over-tops the Fremont Weir and spills over the Sacramento Weir into the Bypass. In 1998, the Yolo and Sutter bypasses provided good habitat for fish, particularly splittail, when they were flooded for several weeks in March and April. In order to provide spawning habitat for splittail, water must remain on the bypasses until fish have completed spawning, and larvae are able to swim out on their own, during the draining process.

The decline in splittail abundance has taken place during a period of increased human-induced changes to the seasonal hydrology of the Delta, especially the increased exports of freshwater. These changes include alterations in the temporal, spatial, and relative ratios of water diverted from the system. These hydrological effects, coupled with severe drought years, introduced aquatic species, the loss of shallow-water habitat to reclamation activities, and other human-caused actions, have reduced the species' capacity to recover from natural seasonal fluctuations in hydrology for which it was adapted.

Analyses of survey data collected from 1967 to 1993 (Meng 1993, Meng and Moyle 1995) and data from 1967 to 1997 by Service, CDFG, and University of California at Davis biologists from several different studies indicate the following results—(1) Overall, splittail abundance indices have declined. Meng and Moyle (1995) demonstrated that on average, splittail have declined in abundance by 60 percent through 1993. The CDFG updated these data to include the most current data available and provided to the Service. The CDFG calculated the data using the updated information. The results were similar. These updated data demonstrate that on average, splittail have declined significantly in abundance by 50 percent since 1984. The greatest declines (over 80 percent) were found from studies that sampled the shallow Suisun Bay area, the center of the range of the species (Meng and Moyle 1995). The updated information also show a significant decline (43 percent) for the studies that sampled the shallow Suisun Bay area. A study that began in 1980 in the lower Estuary, at the outermost edge of splittail range, found the lowest percent decline (20 percent) (CDFG unpublished data) through 1993. The analysis completed on the updated data also showed the smallest decline for this study (6 percent). The number of splittail young taken at State and Federal pumping facilities (measured as number of individuals per acre-foot of water pumped), as of 1993, had declined 64 percent since 1984. With the updated data, the number of splittail young taken at State and Federal pumping facilities demonstrated a 97 percent increase. This percent increase is due to the unusually high salvage that occurred during 1995.

We estimate splittail populations to be 35 to 60 percent of what they were in the 1940s, and these estimates may be conservative (Moyle in prep). CDFG midwater trawl data indicate a decline from the mid-1960s to the late 1970s, followed by a resurgence, with yearly fluctuations, through the mid-1980s. From the mid-1980s through 1994, splittail numbers have declined in the Delta, with some small increases in various years. This decline is also demonstrated in the updated CDFG data.

(2) Overall splittail abundances vary widely among years. Sommer *et al.* 1997 also found that splittail recruitment success fluctuates widely from year to year and over long periods of time. During dry years abundance is typically low. During the dry years of 1980, 1984, 1987, and 1988 through 1992, splittail abundance indices for young-of-the-year were low, indicating poor spawning success. Additionally, all year class abundances were low during these years. In 1994, the fourth driest year on record, all splittail indices were extremely low.

We believe wet years provide essential habitat for splittail and allow populations to rebound from dry years. Successful reproduction in splittail is often highly correlated with wet years. Large pulses of young fish were observed in wet years 1982, 1983, 1986, and 1995. In 1995, one of the wettest years in recent history, an increase in all indices was recorded, as in 1986, which was another wet year following a dry year. However, young of the year taken per unit effort (for example, either the number of fish per net that is towed or

the number of fish per volume of water sampled) has actually declined in wet years, steadily from a high of 12.3 in 1978 to 0.3 in 1993. The updated data from CDFG demonstrate this same decline in wet years, from 37.3 in 1978 to 0.6 in 1993. The abundance indices of splittail during the years of 1995, 1996, and 1997 were 44.5, 2.1, and 2.6, respectively. Year 1995 was a very wet year and splittail abundances were high. Years 1996 and 1997 were wet years, yet abundance indices were low. However, overall splittail declines remain high (82 percent/43 percent with updated data) in the shallow-water Suisun Bay area, the center of its distribution.

We believe high abundance indices in 1995 are an artifact of the highly unusual hydrological conditions that occurred. Therefore, we also calculated all of the percent declines, as stated above, without the 1995 abundance indices in the analysis. The overall decline is 67 percent. The decline from the studies in the shallow Suisun Bay area without 1995 is 80 percent. For the study in the lower Estuary, the decline is 39 percent. The salvage data collected at both the State and Federal pumping facilities demonstrate a 22 percent decline. Other than 1995, the salvage data include 1996 and 1997.

(3) A strong relationship exists between young-of-the-year abundance and outflow (i.e., river outflow into San Francisco Bay after water exports are removed). As outflow increases, annual abundance of young-of-the-year splittail increases. Changes in outflow explain 55 to 72 percent of the changes seen in young-of-the-year splittail abundance, depending on which survey data are analyzed.

(4) Splittail are most abundant in shallow areas of Suisun and Grizzly bays where they generally prefer low-salinity habitats. Salinities in Suisun and Grizzly bays increase when, as a result of water exports or drought conditions, the mixing zone (the freshwater-saltwater interface) shifts upstream.

(5) Concentration of splittail in shallow areas suggests that they are particularly vulnerable to reclamation activities, such as dredging, diking, and filling of wetlands.

The above data indicate that splittail abundances vary widely in response to environmental conditions, but the general population numbers are declining. The following are some reasons why the species is in decline. The splittail is primarily threatened by the altered hydraulics and reduced Delta outflow caused by the export of freshwater from the Sacramento and San Joaquin rivers through operation of the State and Federal water projects. These operations include not only the export of water from the Delta but also diversion of water to storage during periods of high run-off, which reduce instream flows and available submerged aquatic habitat for spawning and rearing. Additional threats to this species include—

(1) Direct and indirect mortality at power plants and in-Delta water diversion sites;

(2) Reduced river flows and changes in the seasonal patterns of flows in the Sacramento and San Joaquin rivers and their tributaries;

(3) The loss of spawning and nursery habitat as a consequence of draining and diking for agriculture;

(4) The loss of shallow-water habitat due to levee slope protection, marina construction, and other bank oriented construction activities;

(5) The reduction in the availability of highly productive brackish-water habitat;

(6) The presence of toxic substances, especially agricultural and industrial chemicals and heavy metals in their aquatic habitat;

(7) Human and natural disturbance of the food web through altered hydrology and introduction of exotic species;

(8) Flood control operations that strand eggs, larvae, juveniles, and adults;

(9) The increase in severity of these effects by six years of drought; and

(10) Entrainment (pulling) of fish through unscreened or inadequately screened municipal and agricultural diversions.

Previous Federal Action

We included the Sacramento splittail as a category 2 candidate species for possible future listing as endangered or threatened in the January 6, 1989, Animal Notice of Review (54 FR 554). Category 2 candidates were defined as those species for which information in our possession indicated that proposing to list as endangered or threatened was possibly appropriate, but for which conclusive data on biological vulnerability and threats were not currently available to support proposed rules. We discontinued the use of multiple candidate categories on February 28, 1996 (61 FR 7596), and species meeting the definition of the former category 2 are no longer considered candidates.

On November 5, 1992, we received a petition from Mr. Gregory A. Thomas of the Natural Heritage Institute to add the Sacramento splittail to the List of Endangered and Threatened Wildlife and to designate critical habitat for this species in the Sacramento and San Joaquin rivers and associated estuary. Mr. Thomas identified eight organizations as co-petitioners, including the American Fisheries Society, the Bay Institute of San Francisco, the Natural Heritage Institute, the Planning and Conservation League, Save San Francisco Bay Association, Friends of the River, the San Francisco Baykeeper, and the Sierra Club. We published a 90-day finding on July 6, 1993 (58 FR 36184), that the petition presented substantial information indicating that the requested action may be warranted. We initiated a status review and analyzed available data on this species (Meng 1993).

On January 6, 1994, we published a proposed rule to list the splittail as a threatened species and requested public comment (59 FR 862). The proposed rule constituted a 12-month finding that the petitioned action was warranted, in accordance with section 4(b)(3)(B) of the Act.

On January 10, 1995, we published in the **Federal Register** (60 FR 2638) a notice of a 6-month extension to make a final listing determination and reopened a 45-day public comment period on the proposed rule to list the splittail. The basis for this extension was to address differences of scientific opinion concerning the status of splittail upstream of the Delta, especially the existence of a resident population upstream of the Delta. In April 1995, subsequent to the close of the extension period, a moratorium on the processing of all final listing proposals was established by Congress in Public Law 104–6. The moratorium was lifted on April 26, 1996. As mandated by the moratorium, we conducted no actions to finalize the proposed rule during the period April 1995 to April 1996.

As described in detail below, we reopened the comment period on May 18, 1998. We solicited the latest information regarding the abundance and distribution of the species. Additionally, we requested comments concerning the publication, ''Resilience of Splittail in the Sacramento-San Joaquin Estuary'' (Sommer *et al.* 1997).

The processing of this final rule follows our final listing priority guidance for fiscal years 1998 and 1999 published in the **Federal Register** on May 8, 1998 (63 FR 25502). The guidance clarifies the order in which we will process rulemakings giving highest priority (Tier 1) to processing emergency rules to add species to the Lists of Endangered and Threatened Wildlife and Plants; second priority (Tier 2) to processing final determinations on proposals to add

species to the lists, processing new listing proposals, processing administrative findings on petitions (to add species to the lists, delist species, or reclassify listed species), and processing a limited number of proposed and final rules to delist or reclassify species; and third priority (Tier 3) to processing proposed and final rules designating critical habitat. Processing of this final rule is a Tier 2 action.

Summary of Comments and Recommendations

In the January 6, 1994, proposed rule (59 FR 862), we requested all interested parties to submit factual reports or information, that might contribute to the development of a final rule. We contacted State agencies, county governments, Federal agencies, scientific organizations, and other interested parties and requested comments. We held public hearings on the proposed splittail listing in conjunction with hearings on two other proposed Federal actions, the designation of critical habitat for delta smelt (*Hypomesus transpacificus*) (59 FR 852), and the United States Environmental Protection Agency's (USEPA's) water quality standards for the Estuary (59 FR 810). We published newspaper notices of the public hearings on February 4, 1994, in the *Sacramento Bee, Fresno Bee, Los Angeles Times,* and *San Francisco Chronicle,* all of which invited general public comment. We held public hearings on February 23, 1994, in Fresno; on February 24, 1994, in Sacramento; on February 25, 1994, in San Francisco; and on February 28, 1994, in Irvine. At each meeting, we took testimony from 1 p.m. to 4 p.m. and 6 p.m. to 8 p.m.

During the 3-month comment period from January 6 to March 7, 1994, we received comments (i.e., letters and oral testimony) from 133 individuals, organizations, or government agencies. Many of these comments were given at joint public hearings for the combined Federal rulemaking package for the Sacramento-San Joaquin Delta (including the proposal to list the Sacramento splittail, the proposal to designate critical habitat for the delta smelt, and final water quality standards for the Delta being proposed by the USEPA). Only 13 of the 133 commenters addressed the proposed rule to list the Sacramento splittail. Four of the 13 commenters that specifically addressed the proposed rule to list the Sacramento splittail provided oral testimony at the public hearings. Of the 13 commenters mentioned above, nine supported the listing of the splittail, two opposed the listing, and others provided comments considered as neutral. Five conservation organizations (or branches thereof), one sport fishing organization, two interested parties, and a Federal agency (the Bureau of Reclamation (BOR)) supported the proposed listing. The California Department of Water Resources (DWR) and the State Water Contractors opposed the proposed listing. We received no additional expert opinions from independent specialists concerning pertinent scientific or commercial data about the splittail.

On August 4, 1994, we received a letter dated August 3, 1994, from the State Water Contractors requesting a 6-month extension on the listing determination. The reasons provided in the request for extension were the same as those submitted during the public comment period, addressed below.

We granted a 6-month extension to address the status of splittail upstream of the Delta, and the importance of any such splittail to the population as a whole. Therefore, we reopened the public comment period for 45 days, beginning January 10, 1995, and ending February 24, 1995. During this second comment period we received one additional comment letter that opposed the listing of the splittail. The comment letter addressed this issue in part.

On March 19 and March 20, 1998, the DWR and the State Water Contractors, respectively, requested the comment period be reopened. The basis of this request was that substantial data had been collected since 1995 regarding the abundance and distribution of the splittail. We believe that consideration of this and any new information is significant to the final determination of the status of the Sacramento splittail. For this reason, we sought information concerning abundance and distribution data for this species from 1995–1997. Specifically, we sought comments regarding information presented in the publication, ''Resilience of Splittail in the Sacramento-San Joaquin Estuary'' (Sommer *et al.* 1997), and how the results affect our recommendation for listing the Sacramento splittail as a threatened species. The comment period was opened on May 18, 1998, and closed on July 17, 1998. We received comments from eight respondents, whose comments are summarized below.

The written comments and oral statements, questioning or opposing the listing of the splittail, or otherwise providing information, obtained during the public hearings and comment periods are combined into general issues that are summarized, discussed and responded to below. Most of the comments supporting the listing did not provide any additional information, so we have not prepared a discussion or response to these comments.

Issue 1: A respondent commented that our statement about splittail decline was based on data regarding splittail juveniles. The respondent argued that adult splittail are abundant and that our reliance on a limited portion of the year classes for a listing determination is inappropriate.

Service Response: We have reviewed the seven data sets used in the status review (Meng 1993). These data sets include—(1) a fall midwater trawl survey in the upper Estuary by CDFG; (2) a monthly midwater and otter trawl in the lower Estuary by CDFG (San Francisco Bay-Outflow Study, hereafter Bay Study); (3) a monthly otter trawl survey of Suisun Marsh (a tidal marsh next to Suisun Bay) by the University of California; (4) a midwater trawl survey that we conducted at Chipps Island in Suisun Bay; (5) a midwater trawl survey that we conducted in the Sacramento River; (6) a beach seine survey that we conducted in the Delta and Sacramento River; and (7) fish salvage data collected by CDFG and the BOR at the State and Federal pumping facilities located in the south Delta. The beach seine survey and Sacramento River midwater trawl were not used in the analysis of abundance trends because several years of data were missing. (See next comment for criteria used to identify data sets suitable for inclusion in abundance trend analysis.) Of the surveys that were used to establish abundance trends, ratios of young-of-the-year to adults were approximately equal for three out of five surveys (fall midwater trawl, Bay Study, and Suisun Marsh). Of the remaining surveys, the Chipps Island trawl was dominated by young-of-the-year, and fish salvage sampled five times as many young as adults. We calculated percent declines independently for each survey. When the two surveys dominated by young-of-the-year are removed from the analysis, overall average percent decline remains the same. Therefore, the contention that splittail adults are abundant, and that our analysis relied on a particular age-class of the species, is unfounded.

Issue 2: One respondent maintained that the studies we relied on were limited geographically (i.e., to the Estuary) and that splittail may occupy a wider range. Conversely, another respondent commented that the Estuary is the principal habitat of splittail and virtually all splittail are found in the Estuary for the first 2 years of their lives.

There was also disagreement about the gear types used for sampling. One respondent held that they were not appropriate, whereas another respondent stated that gear used by the studies, (i.e., bottom and midwater trawls) captured all sizes of splittail. The respondent that questioned gear suitability also commented that studies used in the listing determination were designed to capture striped bass, were limited in their ability to sample shallow and inshore habitats, and that the use of the CDFG abundance index was inappropriate.

Service Response: We used several criteria to determine if a data set could be incorporated into the analysis of trends in splittail abundance and distribution. Data had to be collected for at least 10 consecutive years and effort had to be relatively constant or a core data set had to be available to extract for analysis. A core data set of at least 10 consecutive years provides the necessary information to conduct an analysis of long term trends in abundance. One respondent referred to the use of two data sets that sampled upstream of the Estuary. These data sets were not included in the analysis of abundance trends because time of year of sampling varied, sampling sites varied, and some years of sampling were missing. These data sets were examined however, for trends in distribution, and showed that capture of splittail decreased as sampling was conducted further upstream from the Estuary. One of the surveys referred to by the respondent consists of samples taken upstream of the Delta and catches young-of-the-year almost exclusively. Because splittail migrate upriver to spawn in the spring (Meng and Moyle 1995), it is likely that these catches are the offspring of splittail that reside further downstream for the remainder of the year.

Regarding gear suitability, a respondent suggested that certain gear used, especially tow nets and trawls, were not appropriate for sampling splittail because of their benthic habits and preference for shallow water. The respondent also referred to gillnetting as an effective method for capturing splittail.

We agree that the summer townet survey is inefficient in sampling splittail and therefore, was not included in the analysis of abundance. However, several trawling methods were included. Meng (1993) compared the effectiveness of three types of gear from one survey—bottom (otter) trawls, midwater trawls, and beach seines. Bottom and midwater trawls sampled equal proportions of all splittail year classes (i.e., young-of-the-year, fish 1 year or older, and fish 2 years or older). The beach seine was selective for young-of-the-year. High catches of young-of-the-year in midwater trawls are thought to reflect movement of young out of near shore areas when water recedes. They are frequently captured in channels, presumably as they move downstream (Meng and Moyle 1995). The information outlined above suggests that regularly repeated bottom and midwater trawls are reasonably effective for sampling splittail and examining trends through time.

There are no long-term gillnetting data sets that meet the criteria above for inclusion in the analysis of abundance. Furthermore, gillnetting results in high fish mortality, and long-term sampling by gillnet is not feasible in waters with sensitive species. Almost all sampling techniques have biases. For the data used in the abundance analysis, the sampling remained constant. Therefore, the biases remained constant through time, and there was a consistent downward trend in splittail abundance.

Most of the sampling programs in the Estuary were initiated to track changes in striped bass or salmon (*Oncorhynchus tshawytscha*) populations. These long term data sets can be used to assess changes in abundance of other species as long as assumptions of sampling design are considered. Limitations of surveys designed for striped bass or salmon have been consistent through time. Problems with sampling shallow and inshore habitats have not changed and should not affect relative abundance trends. Therefore, trends or changes in splittail abundance reflected by these surveys should be unaffected by the various weaknesses identified by the respondent. The high correlation between the CDFG abundance index and numbers of fish (83 percent of the variability is explained) suggests that the index is a reasonable estimator of population trends.

Issue 3: One respondent commented that three separate data sets, including a gillnet survey, suggest that splittail are abundant throughout the Delta. Another respondent countered that gillnetting surveys cited as evidence of abundance were based on a single night of sampling in the American River when splittail were presumably concentrated for spawning. This respondent added that the 60 percent decline cited in the proposed rule is remarkable because one strong year class (such as occurred in 1983) can mask an overall decline in this long-lived species.

Service Response: The Act requires us to base listing determinations upon best available scientific and commercial data. The three data sets referred to by the respondent are limited temporally and geographically. One of the data sets referred to by the respondent covers one night of gillnet sampling in one location. The other two data sets refer to 2 years of sampling, separated by more than 10 years, at the Pacific Gas and Electric plant in Antioch. We considered all available data but determined that incorporation of sporadic or isolated sampling events was not appropriate because of problems associated with drawing conclusions from limited or sporadic data.

Issue 4: A respondent commented that no data were provided to support the conclusion that successful reproduction is highly correlated with wet years.

Service Response: Regression analyses of splittail young abundance versus spring outflow (February-May) show strong relationships. As spring outflow increases, abundance of splittail young increases. Changes in spring outflow explained varying percentages of changes in abundance of splittail young and ranged from 55 to 72 percent, depending on which survey data were analyzed (Meng and Moyle 1995). All of the regression analyses were significant (probability values ranged from less than 0.0001 to 0.0025) (Meng and Moyle 1995). This is a strong correlation between successful reproduction and wet years. The low and high abundance indices of juvenile abundance from 1994 and 1995, respectively, is consistent with this analysis.

Issue 5: One respondent commented that the data we used to determine the decline of splittail was biased by the fact that the time period used to determine pre-decline and post-decline was heavily weighted with wet years in the pre-decline period, thereby biasing the analysis.

Service Response: We analyzed only wet years to determine if there had been a decline within that year type. That analysis indicated that even in wet years, when one would anticipate substantially higher recruitment, there had been an overall decline in splittail abundance. Young-of-the-year abundance declined steadily in the annual Chipps Island trawl in wet years from 1978 to 1993. Abundance in 1993 was less than 3 percent of what it was in 1978. Abundance per unit effort was approximately 12.3 in 1978, 8.1 in 1982, 2.0 in 1983, 1.3 in 1986 and less than 0.3 in 1993. This first analysis was done using a catch-per-tow analysis. The second analysis of splittail abundance using a different analytical method that was based on a catch-per-volume of

water sampled yields a similar result. The volumetric methodology yields a catch per unit effort (CPUE) at the Chipps Island trawl site of 2.6 in 1978, 0.97 in 1982, 0.77 in 1983, 0.73 in 1986, and 0.21 in 1993. These two analyses show that there is an overall reduction in abundance that is not solely a result of drought conditions. Using the second analytical method yields a CPUE for 1995 and 1996 of 2.1 and 0.63 respectively, which were both wet years. If there were a stable number of sexually mature fish throughout the period of decline, one would expect similar reproduction in both years. However, there was a substantial decline from 1995 to 1996, which may indicate that there were not as many adult fish, reflected by the lower CPUE in 1996.

Issue 6: One respondent commented that there is no evidence to support the statement that lower numbers of splittail young-of-the-year during the drought may affect the stock's ability to recover.

Service Response: Our status report (Meng 1993) and the proposed rule (59 FR 862) indicated that wet years are required for splittail recruitment. However, as previously discussed in the analysis of only wet years, young-of-the-year abundance has declined during these years. Because splittail live 5 to 7 years and rely on wet years for strong year classes, a prolonged drought, such as the recent 6-year drought, may provide little recruitment opportunities. The steady decline in young-of-the-year abundance in the Chipps Island trawl, combined with a 5 to 7 year life span and reliance on wet years for strong year classes, suggests that lower numbers of splittail young during the drought will reduce the number of adult fish in subsequent wet years. This overall decline in splittail abundance, even during wet years, may affect the ability of the species to recover.

Issue 7: A respondent commented that the drought, not exports, was responsible for the recent decline in splittail abundance indices.

Service Response: Water exports at the State and Federal pumping facilities are not the only threat to the species related to the State Water Project and the Central Valley Project. The State and Federal water projects are interbasin water delivery systems that include 34 reservoirs, thousands of miles of aqueducts and canals, and large pumping facilities in the south Delta. Storage in reservoirs and conveyance components of the projects also have substantial effects on the splittail. Outflow conditions that inundate large vegetated areas are affected by pumping because increases in pumping must be supported, at some point, by increases in diversions to State and Federal reservoirs. Most rainfall occurs during winter and spring in California, and high spring flows are augmented by snow melt. Historically, high spring flows provided flooded areas and shallows for fish spawning and rearing. Construction of upstream reservoirs allowed large amounts of these high spring flows to be diverted to storage for later release. Diversion of water to storage dampens peak spring flows beneficial to splittail spawning success and provides water for pumping when flows to the Estuary decrease.

Since 1983, the proportion of water exported from the Delta during October through March has been higher than in earlier years (Moyle *et al.* 1992). Changes in timing and amounts of exports, as well as operations of upstream water storage facilities, affect fish migration and spawning habits. Dampening of peak spring flows by springtime diversions to storage to replenish depleted reservoirs has deleterious effects on estuarine species such as splittail, which evolved in a system with periodic spring flooding.

As previously discussed, in wet years when fish production is generally high, large segments of the juvenile population are vulnerable to export facilities both directly and indirectly through entrainment and altered Delta hydrology. This vulnerability is reflected in wet year abundance indices. The adverse effects of the pumps in wet years combined with poor recruitment during dry years exacerbates the population demographic outlook for the splittail.

Issue 8: A respondent commented that calculations in the status report were incorrect. This comment targeted a reference in the proposed rule regarding the abundance of splittail in the Suisun Bay area.

Service Response: This comment was apparently based on a misinterpretation of data included in the status report. The respondent incorrectly assumed that the top half of Figure 13 in the status report supported statements in the text regarding abundance of splittail in Suisun Bay. However, this portion of Figure 13 was intended to indicate the approximate locations and effort of the different surveys used for the status report. The bottom half of Figure 13 was intended to support statements about abundance of splittail in the Suisun Bay area. The respondent acknowledged the high catches in Suisun and Grizzly bays represented in the bottom of Figure 13. Furthermore, two CDFG surveys indicate that abundance of splittail captured by each survey, comprising 72 and 56 percent of the catch, respectively, was taken in those areas (Meng and Moyle 1995).

The respondent also stated that values used to construct the top half of Figure 13 were incorrect. The respondent recalculated the values, but used incomplete data sets (Chipps Island trawl) or incorrect data sets (Suisun Marsh). Furthermore, the respondent referred to Bay Study beach seine data that were not included in the analysis and constructed a table of values without using the appropriate scale included on the original figure. The respondent stated that adding ratios, as in Figure 13, violates basic laws of algebra. However, the figure was not intended to show the sums of catches in different areas. The figure was intended to illustrate the relative contributions of different surveys in different areas. The top half of Figure 13 has been removed from the status report because it was confusing and did not contribute to the analysis.

Issue 9: Two respondents commented that outflow conditions that inundate large vegetated areas and result in favorable spawning conditions are largely unaffected by diversion and export capabilities of the State and Federal water projects.

Service Response: Evidence offered to support this comment is a correlation analysis performed by DWR indicating that there is a positive relationship between the number of days that the Yolo and Sutter bypasses are flooded and splittail young abundance. The Yolo and Sutter bypasses are flood control structures that bypass flows 96 and 128 km (60 and 79 mi) upstream of the confluence of the Sacramento and San Joaquin rivers respectively. Because high outflows and number of days the bypasses are flooded are strongly correlated, it is difficult to isolate flooding of these specific areas as the most important factor influencing splittail abundance. Although flooding of the bypasses may result in favorable spawning conditions, young located in the bypasses are likely to experience high mortality because they become trapped in depressions and agricultural drainage canals when water recedes (Jones and Stokes 1993).

Issue 10: One respondent commented that the effects of entrainment on splittail are questionable. The respondent questioned statements in the proposed rule that splittail may be more vulnerable to the effects of entrainment in water project facilities in dry years. The respondent based the argument on strong relationships between splittail abundance and losses to project operations.

Service Response: An entrainment index was developed (a ratio of indices from two surveys, i.e., salvage of entrained fish at water project facilities divided by the fall midwater trawl index) that demonstrated entrainment of splittail young was higher in wet years. We acknowledge that based on the two surveys comprising the entrainment index, entrainment of splittail appears to occur in proportion to abundance, that is, entrainment is higher in wet years. Because splittail abundance relies on high levels of recruitment in wet years, taking more splittail in wet years does not remove the threat of entrainment in water project facilities from the population. In the early 1980s, hundreds of thousands of splittail young were salvaged monthly by the State export facility alone (this number has decreased as abundance has decreased). Since splittail abundance relies on strong year classes in wet years to support the population during poor environmental conditions, entrainment of large numbers of young, even in proportion to abundance, remains a threat.

With the exception of the Bay Study, all 1995 indices were less than historic wet year indices or, in the case of the Fall-midwater Trawl survey, not as high as pre-decline wet-year indices. However, the combined CVP/SWP salvage was more than double any previous year's salvage index, wet or dry (approximately 8 million young-of-the-year fish for the entire year versus less than 4 million young-of-the-year fish in 1986, which was the next highest entrainment index on record). This suggests that during 1995, the CVP/SWP export facilities in the Delta may have actually entrained fish in greater proportion to abundance than in past years.

Issue 11: One respondent questioned the mechanism by which shallow water habitat has been lost in recent years. The respondent stated that a significant amount of marsh habitat was diked and drained in the first part of this century, but relatively little reclamation of wetlands occurred within the last decade.

Service Response: We acknowledge that most wetland losses in the Estuary occurred in the first part of this century. The recent loss of shallow water habitat in the Estuary is due to increasing salinities in Suisun Bay, a shallow area. Suisun Bay was historically fresh to brackish much of the year and important for the rearing of Delta fishes. Increasing salinities in the Suisun Bay area due to decreases in outflow have reduced available shallow water habitat for splittail, primarily a freshwater species. Increasing salinities in this area have also decreased *Neomysis mercedis* production, a primary splittail food and a factor cited by the respondent as being a possible cause of decline.

Issue 12: One respondent commented that the possible effects of predators and competitors deserves greater consideration. The respondent referred to three introduced species that have experienced population explosions during the same period that splittail declined, two gobies and one atherinid, the inland silverside (*Menidia beryllina*).

Service Response: We acknowledge that the three introduced species and the splittail may occupy similar habitats. However, these introduced species rarely exceed 8 cm (3.4 in) in length as adults, one-fifth the size of splittail. Thus, direct predation by the introduced species on splittail is unlikely. It is also unlikely that adults of the introduced species consume splittail young because of differences in spawning sites, that is, many splittail spawn upstream of and in the upper portions of the Estuary. Furthermore, competition for food or resources (such as spawning sites) is unlikely and would be difficult to extract from the wide array of factors that may affect splittail. The introduced species most likely to affect splittail is striped bass, which is known to favor splittail for food (see Factor C in the ''Summary of Factors Affecting the Species'' section). Splittail and striped bass, however, have coexisted for decades in the Estuary. Recent declines in splittail have occurred in concert with striped bass declines.

Issue 13: A respondent stated that the reason for our decision not to designate critical habitat is not entirely clear from the proposed rule. Further, the respondent expressed concern that we provide splittail with a level of protection afforded by listing the species as threatened pursuant to the Act rather than addressing threats to the species in recovery work that is already being undertaken for Delta fisheries in general.

Service Response: We clarify the decision not to designate critical habitat in the ''Critical Habitat'' section of this rule. Based on our analysis of threats, including the lack of recovery efforts implemented and regulatory controls, we determined threatened status for the splittail in this rule. The Sacramento San-Joaquin Delta Native Fishes Recovery Plan (U.S. Fish and Wildlife Service 1996) discusses threats and needed restoration actions in detail.

Issue 14: One respondent questioned the need to list splittail with current protections in place for delta smelt and proposed USEPA water quality standards for the Estuary (59 FR 810). The respondent stated that increases in water demand for splittail would affect the predictability of water supplies for other users.

Service Response: In determining to list the splittail, we considered the effects of the listing of delta smelt and designation of critical habitat for the delta smelt (60 FR 4664) as well as implementation of the State's Water Quality Control Plan (WQCP). We believe that the life history and habitat requirements of splittail will not be satisfied by these actions.

The life history characteristics and habitat usage of splittail differ from those of delta smelt. Splittail migrate farther upstream to spawn in the Sacramento and San Joaquin rivers and their tributaries than do delta smelt. Consequently, protections for this species will not overlap completely with those needed for splittail. Splittail also differ from the already listed species in their habitat usage. Because splittail prefer shallow water, with emergent vegetation, they are particularly threatened by reclamation, dredging, and development activities in those habitat types. Finally, because splittail are long-lived and spend much of their lives in the Estuary, contaminants pose a greater threat to this species than to delta smelt.

As described in detail under Factor D of the ''Summary of Factors Affecting the Species'' section, water quality objectives developed by the SWRCB could benefit splittail. In 1995, the SWRCB adopted a WQCP for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (95–1WR, May 1995) to protect water quality and to control water resources that affect the beneficial uses of the Bay-Delta Estuary. As an interim implementation measure, the SWRCB adopted Water Rights Order 95–6, which relies on the CVP and SWP to comply with the new standards. The flows identified in the water rights decision 95–6 that were implemented through section 7 of the Act with the BOR and USEPA were intended to benefit splittail as well as delta smelt. These flows would provide spawning flows in tributaries as well as habitat and transport flows in and through the Delta if the WQCP is fully implemented. However, this WQCP has not proven entirely adequate to protect against the effects of entrainment both at the CVP/SWP export facilities and other agricultural and municipal water diversions. For example, operations of the CVP and SWP facilities were altered only slightly for a 3-day period of time

in June of 1995 to reduce the effects of salvage on out-migrating juvenile splittail. This action was taken after almost 6 million juvenile splittail were entrained and salvaged at the State and Federal export facilities in the spring of 1995. Between the middle of April and the end of June, over 6.3 million juvenile fish were salvaged at these facilities. Based on data that we received from ongoing monitoring programs during 1995, the vast majority of the fish were probably of San Joaquin River origin, where substantial spawning has not occurred in over a decade. The monitoring programs showed little juvenile production and out migration from the Sacramento River. Even if a population exists upstream of the Delta, State and Federal project operations have done little, even in this new regulatory environment, to protect against entrainment of those fish. Additionally, exports during the out migration period change the behavioral cues and hydrology that may affect the ability of juveniles to move out of the Delta.

Moreover, the SWRCB has not completed the development of a long term implementation plan for the 1995 WQCP. The SWRCB has prepared a draft Environmental Impact Statement that evaluates a range of potential alternative actions so that responsibility to meet the water quality objectives in the 1995 WQCP can be allocated. The SWRCB is currently holding hearings to obtain all necessary information so that an implementation plan can be developed. An experimental proposal has been developed by stakeholders on the San Joaquin River along with the Service and other State and Federal agencies. The proposal, known as the Vernalis Adaptive Management Plan (VAMP), would evaluate the effects of flow and exports on salmon, along with a barrier at the head of Old River, for the next 12 years. It may be accepted by the SWRCB and may provide some benefit to splittail, but full evaluation of the benefits and impacts to the species will not occur until the experiment is complete. We will participate in the implementation of VAMP.

Issue 15: Several respondents questioned our reliance on the entrapment zone (the area of the Estuary where saltwater and freshwater meet) and its importance to splittail. Another respondent questioned our reliance on changes in salinity and shifts in the distribution of splittail upstream concurrent with shifts in the salinity.

Service Response: We agree that there is little if any correlation between splittail abundance and the entrapment zone. However, the entrapment zone is an important ecological indicator. It provides an area in the estuary that is highly productive. However, when located upstream, the mixing zone is not as productive because it is confined to deep river channels where the total surface area is smaller, fewer shoal areas exist, water currents are swifter and more turbulent, and zooplankton productivity is low.

Issue 16: One respondent commented that we could not support the conclusion that all size classes of splittail suffer near total loss at the export facilities due to entrainment.

Service Response: According to salvage facility personnel, juvenile splittail may suffer up to 50 percent mortality due to salvage at the facilities (Scott Barrow, CDFG, pers. comm. 1995). Other forms of mortality exist due to screen efficiency, predation, and impingement that are not quantifiable at this time. We have modified the rule accordingly.

Issue 17: Several commenters raised the issue of peer review of the data and conclusions. One commenter also stated that there was no public access to the data.

Service Response: The proposed rule to list the splittail was published on January 6, 1994, prior to the time that the interagency policy on peer review (59 FR 126) was made effective on July 1, 1994. Despite this, we sent data used in the proposed rule to Dr. Bruce Herbold, USEPA; Dr. Peter Moyle, University of California at Davis; and Dr. Larry Brown, U.S. Geological Survey (USGS) for their review. None of these reviewers provided written comments concerning the data. Additionally, several meetings were held between the Service and CDFG's Bay-Delta Division during the comment period to discuss the data and methodologies used to establish trends in abundance. The CDFG did not disagree with the data used or the methodology used in the analysis.

As described above, we reopened the comment period twice, once in 1995 and again in 1998. During the reopened comment period beginning in January 1995, we considered a substantive issue that CDFG and others raised during the original comment period. The subject of the significant scientific disagreement, that resulted in reopening the comment period, was whether a resident population of Sacramento splittail existed in the upper rivers that was not being detected by the current sampling methodologies. The CDFG conducted a study in the Fall of 1994 to address this question. The results of the study were available in February of 1995 and largely supported our listing. This study was conducted by the CDFG under the review of an interagency science committee (the Interagency Ecological Program). The re-opening of the comment period in 1998 was based, in part, on information in the peer-reviewed publication ''Resilience of Splittail in the Sacramento-San Joaquin Estuary'' (Sommer *et al.* 1997).

Moreover, the status report that Meng prepared was peer reviewed for its scientific basis. That status report was the basis of an article in the Transactions of the American Fisheries Society, which was again peer reviewed (Meng L. and P. Moyle, 1995). Additionally, the final Sacramento-San Joaquin Delta Native Fishes Recovery Plan (U.S. Fish and Wildlife Service 1996) that discussed the status of the splittail was subject to public comment and review.

Although obtaining raw data from various agencies may have been delayed due to quality assurance and quality control, all data was available between the closing of the first comment period, and during both of the reopened comment periods. Although there may be minor differences in the final analysis contained in this final rule, these differences do not change our conclusion regarding the status of the species and the threats to the species.

Issue 18: The one comment received during the second comment period suggests that there may be a resident splittail population upstream of the Delta in the upper reaches of the mainstem rivers or their tributaries.

Service Response: We agree that splittail do occur in the upper reaches of the Sacramento and San Joaquin rivers in some years. While we excluded the beach seine data sets from the analysis of abundance (for the reasons stated in our response to Issue 2), we never eliminated these, or other data sets, from our analysis of distribution. The beach seine sampling collects relatively fewer fish, on a catch-per-unit-effort basis, than do the surveys further down the Estuary, such as the Chipps Island trawl. This sampling indicates that the splittail, although utilizing these upstream areas, are not utilizing them in substantial numbers, and certainly not in sufficient numbers to constitute a population. The CDFG sponsored a special study to try and determine if there were substantial resident populations upstream of the Delta in 1994 (Baxter 1994). The results of this study indicated that in 1994, the bulk of the population resided in and around Suisun Bay, Big Break, and Grizzly Bay, which correlates to the distribution of shallow water wetlands throughout this region.

Issue 19: Below we summarize comments from several respondents concerning the Sommer *et al.* (1997) paper. The respondents state the following reasons for not listing the splittail—(1) The splittail is more widely distributed and abundant than previously thought; (2) The splittail is a highly fecund, resilient, and long-lived species with more than one year class spawning at one time; therefore, it can rebound because of its high reproductive capacity; (3) The splittail's range has not decreased dramatically; (4) The splittail is able to endure drought conditions and rebound in wet years; (5) Splittail are robust and can handle stress at the export facilities; and (6) Splittail are not at risk from pumping; they are taken in relative proportion to their abundance.

Service Response: Item 1—We disagree with the statement that the splittail is more widely distributed and abundant than previously thought. However, we have always asserted that in some years splittail are found in the upper Sacramento and San Joaquin rivers. During wet years, splittail are more widely distributed and may be abundant, due to more available spawning habitat. For instance, the wet year of 1995 enabled splittail to use habitats that are normally unavailable to them during normal to dry years. During 1995, the Yolo Bypass provided good habitat for spawning splittail and splittail abundance increased. The Bypass provided suitable spawning habitat only because it was a wet year and the Bypass held water later in the year and for a longer duration than is typical. Therefore, when sampling was conducted during 1995, splittail seemed to be abundant and were found in areas, like the Yolo Bypass, that they may not normally be able to use. These managed habitats cannot be relied upon during normal or dry years to provide spawning habitat unless they are consistently managed for the spawning and rearing needs of splittail. During dry years, splittail abundance is restricted by the availability of spawning habitat.

Item 2—We agree that the data demonstrate that splittail are a fecund (fertile) species. However, even fecund species can become low in abundance due to poor habitat conditions for spawning, which may occur during normal or dry years. Young-of-the-year and juvenile survivability recruitment is important to the splittail's recovery. Even though splittail spawn several thousand eggs, not all will reach adulthood. Splittail need good habitat for survivability to spawning age.

Long-lived is a relative term. Compared to an annual species such as the delta smelt, splittail, which live for an average of 5 to 10 years, are long-lived. However, if compared to the green sturgeon, which lives to 20 to 40 years of age, the splittail has a short life span.

The term resilience is also a relative term. Due to the larger body size, splittail may be more resilient than delta smelt to entrainment or impingement, for example, but they are less resilient than larger fish such as salmon. We agree with the statement that more than one year class of splittail may spawn at one time. However, spawning is not always successful. Spawning success is correlated with several factors, including wet years, high Delta outflow, and the presence of flooded vegetation. If these parameters are not present, then the splittail may have low recruitment to the population during that year or years.

Item 3—We disagree with the statement that the splittail range has not decreased dramatically. Historically, splittail were found as far north as Redding on the Sacramento River (at the Battle Creek Fish Hatchery in Shasta County), as far south as the present-day site of Friant Dam on the San Joaquin River, and up the tributaries of the Sacramento River as far as the current Oroville Dam site on the Feather River and Folsom Dam site on the American River. Splittail were captured in southern San Francisco Bay and at the mouth of Coyote Creek in Santa Clara County, but they are no longer present there. The species is, for the most part, now confined to the Delta, Suisun Bay, Suisun Marsh, and the Napa River, reflecting a significant decrease in their historical range. Splittail are able to use the Sutter and Yolo bypasses only in wet years. In addition, these bypasses are managed artificially.

Item 4—We disagree with the statement that splittail are able to endure drought conditions and rebound in wet years. The years 1987 through 1992 were consecutive dry years and demonstrated low abundance indices for splittail. During dry years, splittail abundance is restricted by the availability of spawning habitat. However, 1993 was an above normal water year and splittail abundance indices remained low. During 1993, after the end of the dry and critically dry years of 1987 through 1992, water was diverted to fill up the reservoirs that had been depleted during the drought. Therefore, even though 1993 was an above normal year, the additional water was unavailable for the fish to use.

During the wet years of 1982, 1983, 1986, and 1995, splittail abundance indices were high for all age classes, as sampled in the fall mid-water trawl. During the wet years of 1984, 1996, and 1997, splittail indices were low. Therefore, if wet or above normal year types were the controlling factor, essential habitat for splittail would have been provided and splittail numbers should have been higher in 1984, 1996, and 1997. These data show that splittail do not necessarily have high abundance indices during all wet years. Even though 1984, 1996, and 1997 were wet years, they may not have had the appropriate hydrology, water quality, etc., to support a large spawning class. The timing and magnitude of flow events are likely significant parameters affecting splittail spawning success. Spring flows also have to be of adequate duration and timing to provide the fish with flooded vegetation for escape cover, foraging areas, etc. Weather patterns are too unpredictable to rely on wet years for the recovery of splittail; extended periods of drought would result in low reproduction and population declines. (Also see the response to Issue 6).

Item 5—We agree that splittail are a robust fish. They can obtain a size of over 40 cm total length. However, even though they are a relatively large fish, they are still subject to stress at the water export facilities. Eggs and larvae are still subject to entrainment and impingement at the facilities. The largest losses at the pumping plants occur in wet years when up to millions of splittail young are lost during the spring months. Although splittail salvage better than the delta smelt, which cannot be salvaged at all, recent problems at the export facilities have reduced the salvage of all fish. New species such as the exotic mitten crab have recently posed problems at the export facilities. Salvage of fish was requested to be stopped until the crab problem can be resolved.

Item 6—We disagree with the comment that splittail are not at risk from pumping and that they are taken in proportion to their relative abundance. Although it may appear that splittail are able to handle the stress of salvage at the export facilities, they may not necessarily survive after release. Better studies are needed to determine the extent of latent mortality.

Splittail are more likely to be at risk during pumping, depending on the water year and where the fish are distributed during spawning. During dry years, splittail are concentrated in the few areas that have flooded vegetation that can support spawning. Therefore,

most of the population may be concentrated in one part of the Delta, potentially resulting in more take at the pumps in proportion to the amount of fish in the system. Conversely, more splittail are taken at the pumps during wet years because there is more habitat available for spawning, which may result in more recruitment to that year class. Depending on the distribution of spawning, fish may be taken in disproportion to their overall abundance.

Issue 20: Several respondents stated that programs and agreements like the Bay/Delta Accord, CALFED (a consortium of State and Federal agencies convened to address water issues in California), and VAMP will result in recovery of splittail. Therefore, there is no need to list the species.

Service Response: We agree that the threats associated with the degradation of the Delta may be lessened by the successful implementation of the Bay/Delta Accord, CALFED, Central valley Project Improvement Act (CVPIA), and VAMP. However, to date, the results of these agreements and programs have not been quantified due to subsequent wet years that did not require regulatory intervention for delivery of water for fish species. At this time, it cannot be determined whether these actions have been implemented to an extent that will prevent the splittail from becoming endangered within the foreseeable future.

Issue 21: A respondent stated that we failed to comply with the Regulatory Flexibility Act and Executive Order 12630.

Service Response: The Endangered Species Act requires that listing decisions be made solely on the basis of biological information. The legislative history to the Endangered Species Act amendments of 1982 states:

''The Committee of Conference * * * adopted the House language which requires the Secretary to base determinations regarding the listing or delisting of species 'solely' on the basis of the best scientific and commercial data available to him. As noted in the House Report, economic considerations have no relevance to determinations regarding the status of species and the economic analysis requirements of Executive Order 12291, and such statutes as the Regulatory Flexibility Act and the Paperwork Reduction Act, will not apply to any phase of the listing process.'' (H.R. Conf. Rep. No. 567, 97th Cong., 2d Sess. 12, 19–20 (1982); S. Rep. No. 418, 97th Cong., 2d Sess. 4 (1982)).

In consultation with our Solicitor's Office, we have concluded that the analyses required by the Regulatory Flexibility Act are not applicable to listing determinations.

Regarding Executive Order 12630, Governmental Actions and Interference with Constitutionally Protected Property Rights, the Attorney General has issued guidelines to the Department of Interior (DOI) on implementation of this Executive Order. Under these guidelines, a special rule applies when an agency within the DOI is required by law to act without exercising its usual discretion—that is, to act solely upon specified criteria that leave the agency no discretion.

In this rulemaking context, we might be subject to legal challenge if we considered or acted upon economic data. In these cases, the Attorney General's guidelines state that Takings Implications Assessments (TIAs) shall be prepared after, rather than before, the agency makes the decision upon which its discretion is restricted. The purpose of TIAs in these special circumstances is to inform policy makers of areas where unavoidable fifth amendment taking exposures might exist. Such TIAs shall not be considered in the making of administrative decisions that must, by law, be made without regard to their economic impact.

As described above, Congress required us to list species based solely upon scientific and commercial data indicating whether or not they are in danger of extinction. The Act does not allow us to withhold a listing based on concerns regarding economic impact. The provisions of the guidelines relating to nondiscretionary actions clearly are applicable to the determination of threatened status for the Sacramento splittail.

Summary of Factors Affecting the Species

After thorough review and consideration of all the best scientific and commercial information available, we have determined that the Sacramento splittail should be classified as a threatened species. Procedures found at section 4 of the Act and regulations implementing the listing provisions of the Act (50 CFR part 424) were followed. A species may be determined to be endangered or threatened because of one or more of the five factors described in section 4(a)(1). These factors and their application to the Sacramento splittail (*Pogonichthys macrolepidotus*) are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* The Sacramento splittail, once widely distributed in the Central Valley of California from Redding to the modern-day site of Friant Dam near Fresno, is now primarily restricted to the Estuary due to dams, diversions, dredging, and the diking and filling of historic flood basins. Within this constricted range, splittail have declined by about 62 percent since 1984. However, overall percentage decline over its historical range is much greater. Populations have fluctuated somewhat in the past, with most recruitment taking place in wet years. In wet years since 1978, however, splittail recruitment has declined consistently with catch-per-unit-effort of 12.3, 8.1, 2.0, 1.3, and 0.3 for 1978, 1982, 1983, 1986, and 1993, respectively. The updated data from CDFG demonstrate the same decline by wet years, with 37.3, 15.5, 8.9, 7.3, and 0.6 in 1993. Other wet year data include 1995, 1996, and 1997. These indices are 44.5, 2.1, and 2.6, respectively. However, as stated before, 1995 was a very wet year and there was suitable spawning habitat for splittail in the Estuary. The 1995 data point does not represent a reversal in the decline of the species. Splittail declines are highest (82 percent/83 percent with updated data) in the shallow water Suisun Bay area, the center of its distribution. Therefore, as stated above, wet years are not always indicative of high abundance indices. However, the current data do not indicate a change in this trend.

Delta water diversions and exports currently total about 9 million acre-feet per year, but plans now being prepared could increase exports and diversions in the future. The Federal and State water projects presently export about 6 million acre-feet per year from the Delta when sufficient water is available, and in-Delta agricultural uses result in diversion of about 3 million additional acre-feet per year. We know of 21 major Central Valley Project, State Water Project, or private organization proposals that would result in increased water exports from the Delta, reduced water inflow to the Delta, changes in timing and volume of Delta inflow, or increases in heavy metal contamination of the Delta. These proposed projects or actions include but are not limited to revisions to the Central Valley Project Operations Criteria and Plan, Los Banos Grandes Reservoir, Los Vaqueros Reservoir, South Delta Water Management Program, North Delta Water Management Project, West Delta Water Management Project, Delta Wetlands Corporation Water Storage Project, Folsom Dam Reoperation, Oroville Dam Reoperation, Auburn Dam, Central Valley Project contract renewals and amendments such as those on the American River that include the

Sacramento County water contracts, East Bay Municipal Utilities District water contract, as well as other increases in diversions resulting from the American River Water Forum process. Other water contracts renewals include the Solano County Water District. Contra Costa Water District is currently proposing to increase their diversions for future water supply. The Central Valley Project and State Water Project wheeling purchase agreement, reactivation of the San Luis Drain, Stanislaus-Calaveras River Basin Water Use Program, Suisun Marsh Project Phase Three and Four, Federal Water Project change in diversion point, and State Water Project Pump additions. All of these projects would impact the habitat of the splittail.

Changes in water diversions are most likely at the State Water Project. For the most part, the Federal pumping plant has operated at capacity for many years (pumping at rates up to 4,600 cubic feet per second (cfs)), so increased exports at this plant are unlikely. However, the State Water Project pumping plant and capacity of the State Aqueduct have considerable unused capacity. The State Water Project currently pumps at rates up to 6,400 cfs and plans to increase pumping rates by more than 50 percent. Local private diverters are relatively stable and export up to 5,000 cfs from about 1,800 diversions scattered throughout the Delta. The DWR (1992) reported past and projected State Water Project deliveries from Delta sources during the years of 1962 to 2035. In the 1980s, deliveries ranged from 1.5 million acre-feet to 2.8 million acre-feet. By 2010, deliveries of up to 4.2 million acre-feet are planned.

Since 1983, the proportion of water exported from the Delta during October through March has been higher than in earlier years (Moyle *et al.* 1992). Changes in timing and amounts of exports affect fish migration and spawning habits, as well as operations of upstream water storage facilities. Dampening of peak spring flows by springtime diversions to storage facilities to replenish depleted reservoirs has deleterious effects on estuarine species such as the splittail, which have evolved in a system with periodic spring flooding.

Federal and State water diversion projects in the southern Delta export, by absolute volume, mostly Sacramento River water with some San Joaquin River water. During periods of high export pumping and low to moderate river flows, reaches of the San Joaquin River reverse direction and flow upstream to the pumping plants located in the southern Delta. When total diversion rates are high relative to Delta outflow, the lower San Joaquin River and other channels have a net upstream (i.e., reverse or negative) flow. Out-migrating larval and juvenile fish of many species become disoriented due to reverse flows. Fish, including Sacramento splittail, delta smelt, longfin smelt (*Spirinchus thaleichthys*), and all runs of salmon and steelhead are lost at pumps and to predation at various water facilities and other diversion sites. Because data from State and Federal pumping facilities indicate that splittail migrate upstream to spawn, positive outflows are also important to transport splittail young downstream (Meng 1993).

In recent years, the number of days of reversed San Joaquin River flow have increased (Moyle *et al.* 1992), particularly during the February-June spawning months for splittail. Reverse flows in the San Joaquin River may transport more splittail young towards pumping facilities in the south Delta where the splittail are entrained by pumps and diversions. The survival rate of splittail salvaged from entrainment is unknown. However, salvage operations have been shown to result in 50 percent losses of salvaged fish (Scott Barrow, DFG, pers. comm. 1995) (see factors C and E of this section for more discussion about entrainment and salvage).

With full implementation of the WQCP for the Sacramento-San Joaquin Estuary (described below) we anticipate an overall reduction of the number of days of reverse flow in the lower San Joaquin River during the spring period. Pumping will shift from the spring period to later in the year. This pumping will likely have to be supported by reservoir withdrawals. Reservoir releases in the spring may not be as frequent depending on how much space is available in the reservoirs carried over from the previous year. Increasing demand will also require more support from reservoirs for export, which will alter the flow patterns. Changes in reservoir operations and ramping rates for flood control may affect shallow water spawning habitat along river corridors and exacerbate stranding of splittail.

Estuaries are ecosystems where the mixing zone and salinity levels are determined by interaction of river outflow and tidal action. Splittail are most abundant in the shallow water of Suisun Bay, which is historically associated with the entrapment zone. The young of this species require high zooplankton densities, which are common in the entrapment zone. Production of zooplankton increases when the entrapment zone occupies a large geographic area with extensive shoal regions within the euphotic zone (depths less than 4 meters), such as Suisun and Grizzly bays. Fall mid-water trawl survey data collected by CDFG indicate that 72 percent of the splittail captured from 1967 to 1992 in the Estuary were taken in the shallow water areas of Suisun and Grizzly bays (Meng 1993).

During periods of drought and increased water diversions, the entrapment zone and associated fish populations are shifted farther upstream in the Estuary. During years prior to 1984, the entrapment zone was located in Suisun Bay from October through March (except in months with exceptionally high outflows or during years of extreme drought). From April through September, the entrapment zone usually was located upstream in the river channels. Since 1984, with the exception of the record 1986 flood outflows, the entrapment zone has been located primarily in the river channels during the entire year because of drought and increased water exports and diversions. When located upstream, the entrapment zone is confined to deep river channels where the total surface area is smaller, fewer shoal areas exist, water currents are swifter and more turbulent, and zooplankton productivity is low. In all respects, the upstream river channels are much less favorable for rearing of splittail. Splittail declines since 1984 have been concurrent with an increasing amount and proportion of freshwater diversions that confine the mixing zone to narrow, deep, and less productive channels in the lower rivers.

Recent research indicates that splittail will use the Yolo and Sutter bypasses during the winter and spring months for foraging and spawning (Sommer *et al.* 1997). The bypasses are two extensive floodplain areas used for flood control, agriculture, and wildlife habitat. The bypasses serve as a control outlet for the Sacramento River, which historically flooded large areas of the adjacent valley during high water events in the winter and spring. The water from the Sacramento River is diverted to the bypasses through a passive system of weirs. Water enters the Yolo Bypass from the Sacramento River via the Fremont and Sacramento Weirs. The Sutter Bypass is inundated through the Tisdale Weir.

In 1995, the bypasses provided good habitat for fish, particularly splittail because it was an extremely wet year and the bypasses were flooded for several weeks in March and April. However, the bypasses do not get flooded at all in dry and critically dry years. Therefore, during those years,

when splittail would need the habitat the most, it is not provided by the bypasses.

The Yolo Bypass is inundated whenever the Sacramento River stage at Fremont Weir exceeds 33.5 feet. About 3/4 of the years going back to the mid-1930s have had overflows into the Yolo Bypass. Even though the water was high enough to overtop the Fremont Weir, the water may not have stayed on the Bypass consistently nor long enough to benefit splittail.

Under current water management practices, the bypasses cannot be relied upon throughout any given spawning season to provide habitat for splittail. As mentioned above, water is placed onto the bypasses by overtopping of weirs along the Sacramento River. The flooding of the bypasses is sporadic at best. The volume of water varies from year to year as well as does the time of year when the bypasses are inundated. The water may be placed intermittently on the bypasses, depending on how much rainfall occurs at any given time. For instance, water has been placed onto the Yolo Bypass as early as December and has remained on the Bypass as late as May. Water has also been placed on the Bypass for a short time and drained off. The water could be drained off at some point during the season and then with more heavy rainfall, the bypasses could become flooded again. Therefore, these systems would not provide suitable spawning habitat consistently for splittail. Also, the bypasses do not drain at consistent levels. There are pockets and holes that form which may trap and strand fish as the water drains. During some years, the bypasses do not have enough water or retain water long enough to allow fish to enter the bypasses, spawn, and then grow to a size that will allow them to out-migrate. The artificial systems of the Yolo and Sutter bypasses, as currently managed, cannot be relied upon to recover the splittail. The bypasses provide accessible and suitable splittail spawning habitat only during wet years where the water consistently remains on the bypasses for an extended period of time, as in 1995.

B. *Overutilization for commercial, recreational, scientific, or educational purposes.* Overutilization is not known to be a factor affecting this species. Some scientific collecting is conducted for splittail but these activities do not adversely affect this species. Striped bass anglers report occasional use of splittail as bait, but this usage is thought to have little effect on the species. A small fishery for splittail used to exist in the Sacramento River (Daniels and Moyle 1983, Caywood 1974). However, no recent records of splittail harvest exist, probably because little or no harvest now occurs due to its declines. Records of splittail harvest are also sketchy because identification of this species is often confused with other nongame species. No other recreational or educational uses of this species exist that may affect its abundance.

C. *Disease or predation.* Predation is thought to be a relatively minor factor affecting the Sacramento splittail, especially compared to the other factors discussed in this final rule. Striped bass and other predatory fish are attracted to concentrated prey at fish salvage release sites, such as occur at Clifton Court Forebay. The salvaged fish, including splittail, are collected from holding wells of the salvage facilities, placed in the salvage trucks, transported to the release sites, and deposited in bulk from a pipe running from the truck to a near-shore area, thus resulting in predator attraction. Fifty percent of the released fish are lost (Scott Barrow, CDFG, pers. comm. 1995). These losses are largely due to attraction of predatory fish to the release site of the salvage operations. Splittail and striped bass, however, coexisted for decades in the Estuary and recent declines in splittail have occurred in conjunction with striped bass population declines. Increases in striped bass populations could threaten reduced numbers of splittail. Recently, the CDFG has foregone striped bass stocking or modified their striped bass management because of potential harm to federally listed Sacramento River winter-run chinook salmon and delta smelt.

Susceptibility to disease, due to poor water quality, may be a factor in the decline of splittail. Workers at State and Federal water project facilities in the south Delta have reported high incidences of adult splittail in poor health. The south Delta is dominated by San Joaquin River flow, a large part of which is made up of agricultural drainage. Pesticides (e.g., chlorpyrifos, carbofuran, and diazinon), salts (e.g., sulfates, selenium), and total dissolved solids from this drainage are concentrated by reverse San Joaquin River flows and result in poor water quality (Dennis Westcot, Central Valley Regional Water Quality Control Board, pers. comm.).

D. *The inadequacy of existing regulatory mechanisms.* Regulatory mechanisms currently in effect do not adequately protect the splittail or its habitat. This species is not listed by the State of California.

We are analyzing the potential effects on splittail and other fish and wildlife resources in California as a result of enactment of the CVPIA (Pub. L. 102–575) under the National Environmental Policy Act (NEPA) and the Programmatic Environmental Impact Statement currently under development. The CVPIA may benefit the splittail, but does not adequately protect the species at this time. Two of the stated purposes of the CVPIA are to ''protect, restore, and enhance fish, wildlife, and associated habitats in the Central Valley and Trinity River basins of California'' and ''to contribute to the State of California's interim and long term efforts to protect the San Francisco Bay-Sacramento-San Joaquin Delta Estuary.'' Section 3406(b)(2) dedicates 800,000 acre-feet of Central Valley Project yield annually to implement fish, wildlife, and habitat restoration, and to help federally listed species. The 800,000 acre-feet identified in the CVPIA may be used to meet the DOI's obligations under the Bay-Delta Accord (discussed below). The rest of the water can be used for instream flows, additional Delta outflow, and the other purposes of the CVPIA. Because of the multiple purposes of the CVPIA, flows may be provided at times of the year that may not benefit splittail, such as spawning flows in the fall for salmon. Additionally, because of the need to balance these flows for all uses under the CVPIA, certain spring flows may be less than what is fully needed for spring spawning of splittail. We anticipate that splittail will benefit from implementation of the CVPIA, although the magnitude and timeliness of these protections may be inadequate to prevent further decline of splittail. On November 20, 1997, the DOI announced its decision regarding use of the 800,000 acre-feet of water identified in the CVPIA. The decision is to be implemented for the next 5 years and involves not only upstream actions but also actions in the Delta which may benefit splittail. However, since the Central Valley Project represents only a portion of the water development projects in the Central Valley, the CVPIA is likely insufficient to fully protect splittail at this time.

Protective measures currently being implemented to benefit the delta smelt may benefit the splittail, such as restrictions on pumping under certain conditions. However, the ecological requirements of these species differ, especially with respect to timing of important development stages and habitat uses. Unlike delta smelt, splittail require flooded lowland habitat for spawning and are particularly vulnerable to disturbance or destruction of marshy habitat.

The Suisun Bay area, including Suisun Marsh, is the best known habitat for splittail, but this habitat has been adversely altered by higher salinities in the spring. These higher salinities are caused by operations of reservoirs that divert water to storage as well as exports from the Delta that allow seawater to intrude farther upstream in Suisun Marsh. Prior to the Bay-Delta Accord/WQCP, there were relatively few periods when freshwater outflows of any significance were mandated to be released through the Delta and Suisun Bay for wildlife or fisheries. State and Federal agencies had planned to increase 1991 and 1992 water supplies for out-of-stream uses at the expense of environmental protection of estuarine fish and wildlife resources in the fifth and potentially sixth years of drought (Morat 1991). Because of significantly higher than normal precipitation and subsequent higher instream flows after March 1991, a State agency request for relaxation of Delta water quality standards was withdrawn.

Subsequently, on December 15, 1994, the Federal government, the State of California, and urban, agricultural and environmental interests agreed to the Principles for Agreement on a comprehensive, coordinated package of actions designed to provide interim protection to the San Francisco Bay and Sacramento-San Joaquin River Delta Estuary. That agreement is referred to as the 1994 Bay-Delta Accord (Accord). The Accord was recently extended to December 15, 1999. The Accord established parameters to protect the beneficial uses of the Bay-Delta Estuary. Among these beneficial uses are objectives to ensure adequate Delta outflow for the maintenance of suitable habitat for various life stages of aquatic organisms and objectives for export limits to protect the habitat of estuarine-dependent species and reduce their entrainment at the major export pumps in the southern Delta.

The X2 standard provides outflows to maintain low salinity (2 parts per thousand) habitat at three distinct areas in the Bay-Delta: 1) the confluence of the Sacramento and San Joaquin rivers, 2) Chipps Island, and 3) Roe Island. Compliance of this standard will provide variability for aquatic organisms and aid in their recovery. The E/I ratio establishes a combined export rate (Clifton Court Forebay inflow plus export at the Tracy Pumping Plant) based on the best available estimate of the Eight River Index. When the estimate of the Eight River Index is ultimately made, the export facilities may then pump a set percentage of Delta inflow. Although these parameters will likely protect fish and wildlife, they have not been adequately tested over the past 4 years due to the extreme wet conditions.

Present regulatory processes do not ensure that water inflows to Suisun Bay and the western Estuary will be adequate to maintain the mixing zone near or in Suisun Bay to benefit splittail. The SWRCB has the authority to condition or require changes in the amount of water inflow and the amount of water exported or diverted from the Delta. In testimony given before the SWRCB's Water Quality/Water Rights Hearings in 1987, one of our biologists expressed concern for several Delta species, including splittail (Lorentzen 1987). The SWRCB did not take regulatory or legal action to protect this fish or its habitat during the following 4 years. On May 1, 1991, the SWRCB adopted the WQCP for Salinity for the San Francisco Bay-Sacramento-San Joaquin Delta Estuary (1991 Bay/Delta Plan). On September 3, 1991, under provisions of the Clean Water Act, the USEPA disapproved certain water quality standards due to the SWRCB's failure to adopt criteria to protect estuarine habitat. In April 1992, the Governor of California announced a new water policy that included a directive to the SWRCB to establish ''interim measures'' to reverse the decline of fishes in the Bay and Delta. Accordingly, the SWRCB released an interim water quality plan (Draft Decision 1630) in December 1992 that immediately was suspended by the Governor. In 1993, the USEPA began the process of forming replacement standards for those portions of the 1991 Bay/Delta Plan that were disapproved.

Before USEPA's final rule on Water Quality Standards for Surface Waters of the Sacramento River, San Joaquin River, and San Francisco Bay and Delta became effective on December 14, 1994, and as a result of Bay-Delta Accord that was signed on December 15, 1994, the SWRCB issued and adopted Water Rights Order 95–6. The protections contained in this Water Rights Order were determined to be roughly equivalent to the protections in USEPA's final rule on water quality standards, and USEPA's rule was withdrawn. Although the SWRCB has issued a draft Environmental Impact Report (EIR), no long term implementation plan has been developed or actually implemented for the new water quality plan. Substantial opposition exists to certain implementation measures identified in EIR. Institutional guarantees of compliance have been lacking in the past and are needed in the future before existing mechanisms can contribute to protection of this species. Records show that the previous salinity standards contained in the SWRCB's Water Rights Decision 1485 were inconsistently implemented and frequently violated.

Among other things, the Bay-Delta Accord was intended to provide for increased flexibility in the water project operations to respond to ecological needs. Appropriate use of this increased flexibility may have demonstrated that the established regulatory mechanisms were sufficient to protect splittail. However, even though splittail were proposed for listing before the Bay-Delta Accord was signed, water project operations have rarely been changed to provide protection for splittail. In 1995, for example, a wet year that afforded opportunities to significantly reverse the decline of splittail while maintaining water supply, more than 6.3 million juvenile splittail were entrained at the CVP and SWP facilities in 2 months from late April to late June. Of these fish, at least 50 percent were lost due to transport and release. Predation in Clifton Court Forebay, inefficiency in screening fish from diversion facilities, and handling most likely increased this percentage. Despite the availability of the mechanism for increased flexibility in project operations provided by the Bay-Delta Accord, operations of the CVP and SWP were changed for only one 3-day period in late June of 1995 to minimize entrainment of splittail. Thus, an opportunity to significantly increase abundance and distribution of splittail, and the opportunity to reverse the decline of the species was lost.

As a direct result of a Framework Agreement, the Federal and State governments established the CALFED Bay-Delta Program (Program). This Program is a cooperative effort of the DOI, the U.S. Department of Commerce, the USEPA, the California Environmental Protection Agency, and the California Resources Agency, with the involved public formally participating through the Bay-Delta Advisory Council. The mission of the Program is to develop a long term comprehensive plan that will restore ecological health and improve water management for all beneficial uses of the Bay-Delta system. The plan will specifically address fish and wildlife protection, water supply reliability, levee stability, and water quality issues in the Delta. We are an active participant in the Program and we believe that the eventual implementation of the plan will contribute to the protection and recovery of the Sacramento splittail. However, the plan is not yet developed;

we cannot evaluate specific conservation measures until they have been identified, described, and committed to in an approved final plan.

As a result of the Bay-Delta Accord, a program was established to implement non-flow related actions to benefit fish and wildlife resources. This program is known as Category III. The Category III program is funded by Federal, State, and non-governmental organizations and was funded with $60 million annually for the first 3 years of the Bay-Delta Accord. There was approximately $10 million dollars funded in the first year by the Metropolitan Water District (MWD). The MWD contributed the same amount in the second year, with approximately $2–4 million contributed by other water districts and agencies. In November 1996, California voters passed Proposition 204, which provided State funds for the Category III activities as well as other CALFED activities. In 1997 the Federal government passed an $85 million appropriation for Category III activities and CALFED functions. In the Fall of 1997, CALFED awarded $60.6 million dollars toward proposals under the Category III program. Some of these proposals will benefit splittail through habitat enhancement or restoration. Some of these projects have been implemented. However, due to the time frame required to see if the project has met its objective, that is, to provide suitable spawning habitat for splittail, we cannot determine if these projects will be successful. However, because Category III projects are not intended to enhance flow conditions in the Delta or its tributaries, it cannot provide needed flows.

E. *Other natural or manmade factors affecting its continued existence.* Splittail are vulnerable to natural events, such as drought, because of the consistent decline in population indices and severely constricted range and distribution. Drought will reduce the available spawning area for the splittail because of reduced instream flows. Because the range is already restricted and the population has declined, a prolonged natural event such as drought (compounded by exports and diversions described in Factor A) could endanger the splittail.

Unscreened or inefficiently screened municipal, agricultural, and industrial water diversions and other water facilities are a significant problem for the splittail. It is estimated that there are currently over 1800 unscreened diversions in the Delta. Screens are currently designed for striped bass and salmonids. Approach velocities and mesh sizes are therefore not appropriate for splittail. Behavioral barriers (louver screens) at the State and Federal salvage facilities that were designed using striped bass and salmonid criteria, also are not appropriate for splittail. Release sites for salvaged fish attract predators, likely resulting in low survivorship overall (Lloyd Hess, BOR, pers. comm. 1995). Also, it is likely that few young survive salvaging at the Federal and State pumping plants because juveniles of most fish species are more delicate than adults.

Poor water quality also may adversely affect splittail, through direct exposure to toxins, which increases vulnerability to disease as described above in Factor C, and depletion of zooplankton and invertebrate food sources. All major rivers that are tributary to the Estuary are exposed to large volumes of agricultural and industrial chemicals that are applied in the Central Valley watershed (Nichols *et al.* 1986). Agricultural chemicals and their residues, as well as chemicals originating in urban runoff, find their way into the rivers and Estuary. Approximately 10 percent of the total pesticide use in the United States occurs in the Sacramento and San Joaquin River watersheds (Kuivila and Foe 1995). Recently, high concentrations of organophosphate and carbamate pesticides from agricultural uses have been documented entering the Estuary. These pesticides are acutely and chronically toxic to zooplankton and fishes as far west as Martinez in Suisun Bay and as far south as Vernalis on the San Joaquin River (Foe 1995, Bailey *et al.* unknown date). The periods of pesticide use coincide with the timing of migration, spawning, and early development of splittail. During rainfall runoff events, acutely toxic pulses of pesticides move down the rivers and through the Estuary with remarkable persistence and relatively little dilution (Kuivila and Foe 1995).

Toxicology studies of rice field irrigation drain water of the Colusa Basin Drainage Canal have documented significant toxicity of drain water to striped bass embryos and larvae, *Oryzias latipes* larvae (in the Cyprinodontidae family), and opossum shrimp, which is the major food organism of striped bass larvae and juveniles (Bailey *et al.* 1991), as well as all age classes of splittail. This drainage canal flows into the Sacramento River just north of the City of Sacramento. The majority of drain water samples collected during April and May 1990 were acutely toxic to striped bass larvae (96-hour exposures); this was the third consecutive year rice irrigation drain water from the Colusa Basin was acutely toxic (Bailey *et al.* 1991). Splittail may be similarly affected by agricultural and industrial chemical runoff, particularly because, like striped bass, adults migrate upriver to spawn and young rear upriver until waters recede in late spring.

Some heavy metal contaminants have been released into the Estuary from industrial, urban, and mining enterprises. While the effects of these contaminating compounds on splittail larvae and their zooplankton food resources are not well known, the compounds could adversely affect survival. In addition, increases in urban development in the Sacramento Valley will continue to result in concurrent increases in urban runoff. Selenium has been found in aquatic organisms (Saiki and Lowe 1987, Henderson *et al.* 1995) and fish species in the San Joaquin River watershed (Nakamoto and Hassler 1992). Selenium has been shown to cause reproductive failure, developmental defects, and mortality of fish species (Hermanutz 1992, Skorupa *et al.* 1996).

In recent years, untreated discharges of ship ballast water has introduced exotic aquatic species to the Estuary ecosystem (Carlton *et al.* 1990). Several exotic species may adversely affect the splittail. An Asian clam (*Potamocorbula amurensis*), introduced as veliger larvae in 1986, was first discovered in Suisun Bay during October 1986. By June 1987, the Asian clam was widespread in Suisun, San Pablo, and San Francisco bays irrespective of salinity, water depth, and sediment type at densities greater than 10,000 individuals per square meter. Asian clam densities declined to 4,000 individuals per square meter as the population aged during the year (Carlton *et al.* 1990). Persistently low river outflow and concomitant elevated salinity levels may have contributed to this species' population explosion (Carlton *et al.* 1990). The Asian clam could potentially play an important role in affecting the phytoplankton dynamics in the Estuary. The clam may have an effect on higher trophic levels by decreasing phytoplankton biomass.

The Chinese mitten crab (*Eriocheir sinensis*), has also been recently introduced to the Delta, either by deliberate release to establish a fishery or through accidental release via ballast water. The Chinese mitten crab has interfered with the ability to effectively salvage fish at the export facilities by clogging the internal piping.

Historically, *Eurytemora affinis*, the native euryhaline copepod, has been the most important food for larval fishes in the Estuary. Three non-native species of euryhaline copepods (*Sinocalanus*

doerrii, *Pseudodiaptomus forbesi*, and *P. marinus*) became established in the Delta between 1978 and 1987 (Carlton *et al.* 1990), while *E. affinis* populations have declined since 1980. It is not known if the exotic species have displaced *E.* affinis or whether changes in the estuarine ecosystem now favor *S. doerrii* and the two *Pseudodiaptomus* species (Moyle *et al.* 1989). *Sinocalanus doerrii* is difficult for larval fishes to catch because of its fast swimming and effective escape response (Meng and Orsi 1991). Reduced feeding efficiency and ingestion rates weaken and slow the growth of splittail young and make them more vulnerable to starvation or predation.

We have carefully assessed the best scientific and commercial information available regarding past, present, and future threats faced by this species in this listing determination. Sacramento splittail have declined by 62 percent over the last 15 years. This species has been effectively extirpated from the majority of its range and is now vulnerable to numerous threats in the Estuary as discussed above. Because Sacramento splittail are long-lived, their decline has been gradual, and extinction is not imminent, listing the splittail as endangered would not be appropriate. Although this species is not in imminent danger of extinction, it is likely to become endangered in the foreseeable future if present threats and current population trends continue. Therefore, based on the evaluation of all available information on abundance, present distribution, and threats to this species, we have determined that listing the Sacramento splittail as threatened is appropriate at this time. Critical habitat is not designated for reasons discussed in the ''Critical Habitat'' section of this rule.

Critical Habitat

Critical habitat is defined in section 3 of the Act as—(i) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with section 4 of the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection and; (ii) specific areas outside the geographical area occupied by a species at the time it is listed, upon determination that such areas are essential for the conservation of the species. ''Conservation'' as defined in section 3(3) of the Act means the use of all methods and procedures needed to bring the species to the point at which listing under the Act is no longer necessary.

Section 4(a)(3) of the Act, and implementing regulations (50 CFR 424.12) require that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time the species is listed. The regulations (50 CFR 424.12(a)(1)) state that designation of critical habitat is not prudent when one or both of the following situations exist—(1) the species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of threat to the species, or (2) such designation of critical habitat would not be beneficial to the species. We have determined that designation of critical habitat for the Sacramento splittail is not prudent.

Critical habitat receives consideration under section 7 of the Act. Section 7(a)(2) requires Federal agencies to consult with the Service to ensure that any action they carry out, authorize, or fund does not jeopardize the continued existence of a federally listed species or destroy or adversely modify designated critical habitat. The Service's implementing regulations (50 CFR part 402) define ''jeopardize the continuing existence of'' and ''destruction or adverse modification of'' in very similar terms. To jeopardize the continuing existence of a species means to engage in an action ''that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species by reducing the reproduction, numbers, or distribution of that species.'' Destruction or adverse modification of habitat means a ''direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species in the wild.'' Common to both definitions is an appreciable detrimental effect to both the survival and recovery of a listed species.

For any listed species, an analysis to determine jeopardy under section 7(a)(2) would consider impacts to the species resulting from impacts to habitat. Therefore, an analysis to determine jeopardy would include an analysis closely parallel to or, for the splittail, equivalent to an analysis to determine adverse modification of critical habitat. For the Sacramento splittail, any modification to suitable habitat within the species' range has the potential to affect the species. Actions that may affect the habitat of the splittail include, but are not limited to—(1) reduction of fresh water flows, (2) degradation of water quality, (3) reduction in the quality or quantity of flooded vegetation, (4) alteration of shallow water areas containing submergent (under water) and/or emergent (above the water surface) vegetation, and (5) construction of structures that interfere with migration patterns or block free access to spawning or rearing areas. Although the splittail is a wide ranging species, actions affecting habitat can have relatively large impacts to the population. For example, an activity that destroys or degrades, or blocks access to, an important spawning site could result in reproductive failure of a significant portion of the population affecting population size and age structure in following years. For the Sacramento splittail, we have determined that, were critical habitat designated, it would include no areas that would not be subject to consultation under the jeopardy standard. Moreover, we have determined that the level of habitat impact necessary to result in a determination of destruction or adverse modification of critical habitat (were we to designate critical habitat for the splittail) would also result in a determination of jeopardy to the species. Therefore, were critical habitat to be designated for the splittail, no additional section 7 consultations beyond those caused by the listing itself would take place, nor would the practical result of any such consultations differ.

To date, we have prepared 284 conference reports for the Sacramento splittail for projects involving changes in hydrology, availability of spawning habitat, migratory cues, and other behavioral patterns as well as potential increase in entrainment. Three of these conferences resulted in initial draft jeopardy determinations. These draft jeopardy determinations provide evidence that, by their very nature, impacts to splittail habitat that would result in a determination of adverse modification would result in a determination of jeopardy to the species. For these projects, the habitat impacts were the primary basis for the jeopardy determinations.

The three projects that resulted in initial draft jeopardy conference reports included the proposed Delta Wetlands Project (March 1996) (this project has since been modified to avoid jeopardy), proposed modifications to the south Delta Temporary Barrier Program (January 1997), and the proposed Interim South Delta Program (April 1998). The consultations and conferences for these projects addressed the adverse effects on the delta smelt, its critical habitat, and the Sacramento

splittail. With respect to each project, we concluded that it was likely to jeopardize the continued existence of both species, and to cause the destruction or adverse modification of the delta smelt's critical habitat. In each of these examples, we expressly found that an activity that would destroy or adversely modify critical habitat for the delta smelt would also jeopardize its continued existence. In each case, the project's primary impacts to the splittail, and the primary bases for our conclusion that the splittail would be jeopardized by the project, were habitat impacts. Moreover, had critical habitat been proposed for the splittail, neither these conferences nor any of the others regarding the splittail would have resulted in a finding of adverse modification without a complementary finding of jeopardy.

Apart from section 7, the Act provides no additional protection to lands designated as critical habitat. Designating critical habitat does not create a management plan for the areas where the species occurs; does not establish numerical population goals or prescribe specific management actions (inside or outside of critical habitat); and does not have a direct effect on areas not designated as critical habitat.

A designation of critical habitat that includes private lands would only affect actions where a Federal nexus is present and would not confer any additional benefit beyond that already provided through section 7 consultation under the jeopardy standard. Designation of critical habitat on private lands could, however, result in a detriment to the species. The regulatory effect of critical habitat designation is often misunderstood by private landowners, particularly those whose property boundaries are included within a general description of critical habitat for a species. In the past, landowners have mistakenly believed that critical habitat designation will be an obstacle to development and impose restrictions on the use of their property. In some cases, landowners have believed that critical habitat designation is an attempt by the government to confiscate their private property. As a result of this misunderstanding, critical habitat designation has sometimes reduced private landowner cooperation in efforts to conserve species listed in California. Because the splittail is found in some rivers and tributaries flowing through private lands, the cooperation of private landowners is imperative to conserve the splittail. Controversy resulting from critical habitat designation has been known to reduce private landowner cooperation in the management of other listed species (e.g., the northern spotted owl (*Strix occidentalis caurina*) in Oregon, Washington, and California).

We are concerned that designating critical habitat increases the likelihood of intentional acts of vandalism and habitat destruction due to widespread public misunderstanding of critical habitat. Within the general area where splittail occur, we have documented a number of cases where habitat for listed species was deliberately vandalized or destroyed to avoid dealing with endangered species regulatory issues. Vernal pools, which provide habitat for several listed and candidate species, including the giant garter snake (*Thamnophis gigas*), have been affected negatively by landowners rerouting stream courses in order to eliminate potential endangered species regulatory effects (F. Muth, Fish and Wildlife Service, pers. comm.). We have documented the deliberate destruction of habitat for giant garter snakes (K. Hornaday, Fish and Wildlife Service, pers. comm.) and valley elderberry longhorn beetles (*Desmocerus californicus dimorphus*) (B. Cordone, Fish and Wildlife Service, pers. comm.; S. Pearson, Fish and Wildlife Service, pers. comm.; D. Weinrich, Fish and Wildlife Service, pers. comm.; B. Twedt, Fish and Wildlife Service, pers. comm.) along irrigation canals within the same general areas where the splittail occurs. We are concerned that designation of critical habitat for the splittail may precipitate further habitat destruction affecting splittail and the other species in these habitats.

We acknowledge that in some situations critical habitat designation may provide some value to the species by notifying the public about areas important for the species' conservation and calling attention to those areas in special need of protection. However, in the case of the splittail, we have already spent enormous effort on public outreach and education and believe that critical habitat designation for the splittail would not provide any further notification or education benefit. Subsequent to the publication of the proposed rule to list the splittail, we initiated an extensive public outreach strategy to inform and educate the general public and interested parties within the range of the species. We sent out press releases to local newspapers, contacted elected officials, Federal, State, and county agencies, and interested parties, including private landowners. We also provided the Recovery Plan for the Sacramento/San Joaquin Delta Native Fishes that addresses eight fish species including the splittail to these same interested parties. We will continue to inform and educate the public and private landowners within the range of the species through the dissemination of additional information including copies of the final rule, fact sheets, and question and answer sheets explaining relevant parts of the Act to the parties listed above.

In addition, up-to-date information about the splittail and its habitat, as well as detailed information about the Bay-Delta ecosystem and other areas critical to conserving species that utilize the Bay-Delta, is already widely disseminated to private landowners and to entities or individuals that may propose projects that could affect splittail. As discussed above in Factor E in the ''Summary of Factors Affecting the Species'' section, the CALFED Program is a cooperative effort to develop a long term comprehensive plan to restore ecological health and improve water management for all beneficial uses of the Bay-Delta system. In the process of developing a long term plan, CALFED has held numerous public meetings, workshops, and hearings throughout the State to receive information from the public, as well as to inform the public about the program's goals and ecological needs of the species, including splittail. CALFED maintains an extensive mailing list in order to keep landowners, local, State, and Federal entities, as well as the interested public, apprised of CALFED's actions and the ecological needs of the species that utilize the Bay-Delta ecosystem and other areas necessary for the conservation of species, including splittail.

Regarding any potential benefit provided by informing other Federal and State agencies about the splittail, the knowledge of the range and habitat requirements for this species is well known by Federal agencies, as is evidenced by the 284 conference reports we have prepared addressing the splittail. The Service's Sacramento Field Office stores information about the ranges of listed and other sensitive species by USGS 7½ quad maps in a database. When a Federal agency notifies the Service about a potential project they may authorize, fund, or carry out, the Service does a database search and provides a list of species that may be affected by the proposed action. The plants and animals that are included on the species list are those that may be affected, either directly or indirectly, by the proposed project. Fish and other aquatic species including the splittail appear on the species list if they are in the same watershed as the proposed action. In other words,

splittail appear on a species list if the action occurs anywhere in the Central Valley of California, including all rivers and the tributaries that drain to these rivers. This database is updated if new information about a species is made available. Use of this database provides a superior means of providing information about a species' location to a Federal agency.

Because of the sensitivity of the water community in California, State, Federal, and private water users are also very aware of the species range and habitat requirements. This knowledge extends to local reclamation boards, county boards of supervisors, individual water districts as well as a large number of private individuals. Private consultants, who provide the biological expertise for all of the above mentioned publics, have developed extensive knowledge of the current range, habitat requirements, and potential effects of project proposals on the splittail. Designation of critical habitat would not cause us to provide different or additional information to these entities for the purposes of preserving and/or recovering the species.

We have evaluated the potential notification and education benefit offered by critical habitat designation and find that, for the splittail, there would be no additional benefit over the current outreach and interagency coordination process currently in place. Notification and education can be conducted more effectively by working directly with landowners and communities through the recovery implementation process and, where a Federal nexus exists, through section 7 consultation and coordination. Critical habitat designation for the splittail would provide no further notification or education benefit. In addition, these existing processes preclude problems and potential risks associated with confusion and misunderstanding that may accompany a critical habitat designation.

Critical habitat designation can also aid in the development of a species' recovery plan by identifying the areas needing protection or requiring special management considerations. However, we have already developed the Recovery Plan for the Sacramento/San Joaquin Delta Native Fishes that addresses eight fish species, including the Sacramento splittail. The Recovery Plan identifies the important habitat areas for the splittail.

In summary, we have determined that the designation of critical habitat for the splittail would not be beneficial to the species. For the splittail, the section 7 consultation process will produce a jeopardy analysis that has results equivalent to a critical habitat adverse modification analysis. We already provide private landowners and agencies with up-to-date information on important areas for the splittail. Federal agencies are already engaged in splittail conservation efforts, and we will continue to provide them with up-to-date information on areas important for splittail conservation. We have completed recovery planning for the species, and we will review the information in the recovery plan periodically to determine if updates and revisions are needed. Finally, even if designation of critical habitat for the splittail would provide some small, incremental benefit to the species, that benefit is outweighed by the increased risk of (1) controversy that would hamper recovery efforts or (2) vandalism. Based on this analysis, we conclude that designation of critical habitat for the Sacramento splittail is not prudent.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain activities. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. We initiate such actions following listing. The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies to confer informally with us on any action that is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat. If a species is subsequently listed, section 7(a)(2) requires Federal agencies to insure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with us.

Federal actions that may affect the splittail include, but may not be limited to, those actions authorized, carried out, or funded by the Corps, BOR, National Marine Fisheries Service (NMFS), FERC, and USEPA. The Corps funds projects and issues permits for water pumping and diversion facilities, levee construction or repair, bank protection activities, deep-water navigation channel dredging and dredge spoil disposal projects, sand and gravel extraction, marina and bridge construction, diking of wetlands for conversion to farmland, and tidal gate or barrier installation. The BOR and DWR construct, operate, and manage water storage and delivery facilities. The FERC licenses and re-licenses hydroelectric power facilities, that manipulate instream flows, in the tributaries to the Sacramento and San Joaquin rivers. The USEPA reviews State water quality standards and promulgates replacement standards pursuant to the Clean Water Act if State standards are found to be inadequate. In 1991, USEPA disapproved portions of the SWRCB's WQCP for salinity in the Estuary. Subsequent to that decision, the USEPA developed new water quality standards to replace those that were disapproved. The USEPA published a proposed rule in December of 1993 requesting comments. Prior to finalizing the final rule, the State developed new water quality standards and proposed a new WQCP, 95–1WR, which was implemented, in-part, through Water Rights Order 95–6. The USEPA determined that the State's standards provided equivalent or better protection and has withdrawn the Federal proposal. The State is in the process of developing an implementation plan to fully achieve the goals of the WQCP, and is hearing testimony on many issues.

The Sacramento splittail proposed rule was published January 6, 1994. During the last 4 years, 284 conference opinions have been developed for projects proposed by various Federal agencies. We are prepared to adopt all conference opinions as final biological opinions for the Sacramento splittail, provided that the respective agencies request the adoption in writing and the reinitiation criteria listed under 50 CFR 402.16 do not apply. If there have been no significant changes in an action as planned or in the information used during the conference, we will confirm the conference opinion as the biological opinion on the project, and no further section 7 consultation will be necessary.

However, 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 that the agency action may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Under section 4 of the Act, listing the splittail provides additional impetus for development and implementation of a recovery plan to bring together Federal, State, and private efforts to develop conservation strategies for this species. We convened the Delta Native Fishes Recovery Team to prepare a recovery plan for declining native fishes in the Estuary. The draft recovery plan developed a framework for agencies to coordinate activities and cooperate with each other in conservation efforts. It also set recovery priorities and estimated costs of various tasks necessary to accomplish recovery goals. Site-specific management actions necessary to achieve survival and recovery of splittail and other fishes native to the Estuary ecosystem were also described in this draft plan. The draft recovery plan was released for public review and comment on January 8, 1995 (60 FR 2155). Notice of availability of the final plan was published in the **Federal Register** on November 26, 1996 (U.S. Fish and Wildlife Service 1996).

The Act and implementing regulations set forth a series of general prohibitions and exceptions that apply to all threatened wildlife. The prohibitions, codified at 50 CFR 17.21 and 17.31, in part, make it illegal for any person subject to the jurisdiction of the United States to take (including harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt any such conduct), import or export, transport in interstate or foreign commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

Our policy, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), is to identify to the maximum extent practicable at the time a species is listed those activities that would or would not constitute a violation of section 9 of the Act if a species is listed. Section 9 of the Act prohibits certain activities that directly or indirectly affect listed species. The intent of this policy is to increase public awareness of the effect of a proposed listing on proposed and ongoing activities within a species' range. We believe that, based on the best available information, the following actions will not result in a violation of section 9, provided these actions are carried out in accordance with any existing regulations and permit requirements:

(1) Routine levee road maintenance;

(2) Weed and brush control on levees above the mean higher high water mark or the ordinary high water mark;

(3) Aquatic recreational activities;

(4) Actions that may affect splittail that are authorized, funded or carried out by a Federal agency, when the action is conducted in accordance with an incidental take statement issued by the Service pursuant to section 7 of the Act, and;

(5) Actions that may affect splittail that are not authorized, funded or carried out by a Federal agency, when the action is conducted in accordance with an incidental take permit issued by the Service pursuant to section 10(a)(1)(B) of the Act.

Activities that we believe could potentially harm the Sacramento splittail and result in ''take'' include, but are not limited to:

(1) Diversion of water from any river or stream or other water course that results in the entrainment, injury or death of splittail, including stranding of eggs, larvae, juveniles or adults; or diversions that result in the degradation of waters containing splittail;

(2) Levee slope and bank protection that occurs below the mean higher high water mark or the ordinary high water mark of a water body that results in the loss of shallow water habitat used by splittail for spawning and rearing;

(3) Dredging in any river or stream or other water body that contains Sacramento splittail including dredging in flooded areas where splittail may be spawning, or dredging that results in the degradation of waters containing splittail;

(4) Discharge of fill material into a water body supporting splittail that results in the destruction or degradation of spawning and rearing habitat, substrate composition, water salinity, water quality, channel stability, or migratory corridors;

(5) Discharge or dumping of toxic chemicals, pesticides, organic wastes or other pollutants into a water body supporting splittail, or discharge or dumping of pollutants that results in the degradation of a water body containing splittail; and

(6) Unauthorized collection of splittail.

Questions regarding whether specific activities will constitute a violation of section 9 should be directed to the Field Supervisor of the Service's Sacramento Office (see **ADDRESSES** section).

Permits may be issued to carry out otherwise prohibited activities involving threatened wildlife species under certain circumstances. Regulations governing permits for threatened species are codified at 50 CFR 17.32. Permits for threatened species are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities. For threatened species, permits are available for zoological exhibition, educational purposes, or special functions consistent with the purposes of the Act. Requests for copies of the regulations on listed species and inquiries regarding permits may be addressed to the U.S. Fish and Wildlife Service, Ecological Services, Endangered Species Permits, 911 NE 11th Avenue, Portland, Oregon 97232–4181 (telephone 503–231–6241; facsimilie 503–231–6243).

National Environmental Policy Act

We have determined that Environmental Assessments and Environmental Impact Statements, as defined in the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

Paperwork Reduction Act

This rule does not contain any new collections of information other than those already approved under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.*, and assigned Office of Management and Budget clearance number 1018–0094. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid control number. For additional information concerning

permit and associated requirements for threatened species, see 50 CFR 17.32.

References Cited

A complete list of all references cited in this rule are available upon request from the Sacramento Fish and Wildlife Office (see **ADDRESSES** section).

Authors

The primary author of this rule is Michael G. Thabault, U.S. Fish and Wildlife Service, Sacramento Office (see **ADDRESSES** section).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Regulation Promulgation

Accordingly, part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, is amended as set forth below:

PART 17—[AMENDED]

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500, unless otherwise noted.

2. In § 17.11(h) add the following to the List of Endangered and Threatened Wildlife in alphabetical order under ''FISHES:'

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
FISHES							
*	*	*	*	*	*		*
Splittail, Sacramento	*Pogonichthys macrolepidotus.*	U.S.A. (CA)	Entire	T	656	NA	NA
*	*	*	*	*	*		*

Dated: February 1, 1999.

Jamie Rappaport Clark,

Director, Fish and Wildlife Service.

[FR Doc. 99–2867 Filed 2–5–99; 8:45 am]

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