

GAO

Report to the Honorable
Vic Fazio, House of Representatives

August 1994

ENDANGERED SPECIES

Federal Actions to Protect Sacramento River Salmon





United States
General Accounting Office
Washington, D.C. 20548

152526

Resources, Community, and
Economic Development Division

B-257500

August 15, 1994

The Honorable Vic Fazio
House of Representatives

Dear Mr. Fazio:

Over the last 15 years, the population of winter-run chinook salmon returning to spawn in the Sacramento River has declined by 99 percent. In an emergency ruling in August 1989, the Department of Commerce's National Marine Fisheries Service listed the salmon as a threatened species under the Endangered Species Act; when the salmon population continued to decline, the salmon was reclassified as endangered in January 1994.¹ As a result of this listing, the Service's major responsibilities include (1) advising those federal agencies whose actions may adversely affect the salmon on how to modify their actions to minimize any adverse impacts and (2) enforcing the act's provisions prohibiting the "taking" of salmon.²

In response to your interest in information on the Service's efforts to protect the salmon, we identified major actions the Service has taken. These actions affected (1) the Central Valley Project, a multipurpose water resource project operated by the Department of the Interior's Bureau of Reclamation and the primary federal activity with the potential to affect the salmon, and (2) nonfederal irrigation districts that divert water from the Sacramento River.

Results in Brief

Major actions taken by the Service have included advising Reclamation of changes needed in the way it operates its Central Valley Project to minimize the project's impact on the salmon and enforcing the act's prohibition of the taking of salmon against two irrigation districts.

In both 1992 and 1993, the Service advised Reclamation that the way it operated the Central Valley Project would adversely affect the salmon and identified changes in the project's operations needed to protect the salmon. The major changes generally involved setting requirements for storing cold water in upriver reservoirs, managing the water temperature

¹An endangered species (which may also include a subspecies or a distinct population) is any species at risk of extinction in all or a significant portion of its range; a threatened species is one that is likely to become endangered in the foreseeable future in all or a significant portion of its range.

²"Taking" a species is defined as using any means "to harass, harm, pursue, hunt, shoot, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

in the salmon's spawning areas, removing impediments to the salmon's upstream passage, and adjusting the project's operations in the Sacramento-San Joaquin River Delta to reduce diversion of juvenile salmon into inappropriate waterways. Nevertheless, in 1992 the project's operations resulted in an unexpected loss of salmon because (1) the Service's requirements for the project's operations did not anticipate the heavy rainfall and resultant inflow to the Delta that occurred, (2) it was unclear which agency was responsible for monitoring water flow and salmon conditions, and (3) Reclamation was unable to maintain the agreed-upon maximum water temperatures. Based on the 1992 experience, the Service revised its requirements and clarified changes that were needed for the project's 1993 operations. According to Service and Reclamation officials, the project's 1993 operations were carried out in a manner consistent with the Service's amended requirements.

To enforce the prohibition on the taking of salmon, the Service initiated action against two irrigation districts. One district was restricted from pumping water during salmon migration because its fish screens, installed to divert salmon from the pumps, were ineffective. The other district was fined because its diversion of water from the river resulted in the prohibited taking of salmon. Both irrigation districts subsequently reached agreements with the Service on the actions they needed to take to prevent further enforcement actions by the Service.

Background

The objective of the Endangered Species Act (ESA) is to protect plant and animal species whose survival is in jeopardy; its ultimate goal is to restore these species so that they can live in self-sustaining populations without the act's protection. The National Marine Fisheries Service (NMFS) is responsible for implementing the act's provisions for most protected marine and anadromous species,³ including the endangered Sacramento River winter-run chinook salmon.⁴

The ESA requires that all federal agencies ensure that their actions are not likely to jeopardize the continued existence of protected species or adversely modify habitat critical to their survival. To this end, federal agencies must consult with NMFS when any activity they permit, fund, or conduct could affect an ESA-protected marine species. Depending on the nature of the agency's proposed activity, consultations between NMFS and

³Anadromous species ascend rivers from the sea for breeding.

⁴Under the ESA, the Department of the Interior's U.S. Fish and Wildlife Service is responsible for protecting freshwater and land species.

the agency may be informal or may result in a formal opinion in which NMFS reviews the potential effects of the proposed actions on the protected species or its critical habitat (known as a "biological opinion"). If NMFS issues a biological opinion, a federal agency may still be allowed incidental taking of a protected species as a result of its actions.⁵ However, if NMFS concludes that a federal agency's proposed action will appreciably reduce the likelihood that a species will survive and recover, it issues a "jeopardy" biological opinion. In a jeopardy opinion, NMFS can suggest reasonable and prudent alternatives to minimize and mitigate the taking of a species to remove the potential for jeopardizing its continued existence.

The ESA also prohibits the taking of a protected species and establishes civil and criminal penalties for such actions. However, the act allows NMFS to issue permits that allow the incidental taking of protected species by private entities. To obtain a permit, applicants are required to take appropriate conservation measures to maintain habitat and to enhance and protect the species. The ESA prohibits NMFS from issuing a permit if doing so would appreciably reduce the likelihood that the species will survive and recover in the wild.

The operations of Reclamation's Central Valley Project (CVP) are the primary federal activity that can potentially affect the winter-run salmon. Located in central California, the CVP is Reclamation's largest water resource project. It consists of numerous dams, reservoirs, canals, and pumping and power-generating facilities. The CVP is a multipurpose project designed to serve agricultural, municipal, and industrial users; provide water quality, flood control, and hydroelectric power; and protect wildlife. Major CVP pumping facilities are located in the Sacramento-San Joaquin Delta (Delta), where the CVP's operations are managed cooperatively with the pumping facilities of California's State Water Project.

Nonfederal irrigation districts also operate along the Sacramento River, and their operations can also potentially affect the salmon. The largest of these districts, the Glenn-Colusa Irrigation District, diverts water from the Sacramento River near Hamilton City, California, about 200 miles upriver, to irrigate 175,000 acres, including 25,000 acres in three federal wildlife refuges. Similarly, the Anderson-Cottonwood Irrigation District is located further upriver near Redding, California, the primary spawning area of the salmon, and diverts water used to irrigate 10,000 acres.

⁵The ESA and its implementing regulations define "incidental take" as taking that results from but is not the purpose of an otherwise lawful activity.

Salmon Protection Has Affected the CVP's Operations

Reclamation's operations in the CVP were the federal activities most affected by NMFS' actions to protect the salmon.⁶ In April 1991, NMFS and Reclamation initiated formal consultation to determine whether these operations were jeopardizing the winter-run salmon.⁷ In its resulting biological opinion, NMFS (1) concluded that Reclamation's proposed 1992 operations would jeopardize the survival of the winter-run salmon and (2) identified alternatives to ensure the protection of the salmon. On the basis of this biological opinion, Reclamation agreed to a number of changes in the CVP's operations.⁸ These changes included requirements for storing cold water in upriver reservoirs, managing water temperature in spawning areas, removing impediments to the salmon's upstream passage, and managing the water project's operations in the Delta to keep salmon from being diverted into inappropriate waterways. In the biological opinion, NMFS also recognized that some salmon would still be lost during the CVP's operations. NMFS therefore authorized Reclamation to incidentally take "a small percentage of the total migrant winter-run chinook salmon" during the project's 1992 operations.

During these operations, problems arose as a result of conditions and issues that had not been anticipated or dealt with adequately in NMFS' biological opinion, and salmon were lost. For example, (1) the short-term increase in rainfall and the inflow into the Delta were greater than forecast, (2) the limit on the incidental taking of salmon had not been quantified, (3) it was unclear which agency was responsible for monitoring water flow and salmon conditions, and (4) Reclamation was unable to maintain the agreed-upon maximum water temperatures:

- NMFS' biological opinion assumed that the prevailing critically dry conditions would continue, but rain subsequently fell during February and March 1992. As a result, some of the operating conditions NMFS had established for dry conditions no longer applied, and the biological opinion did not address the operating conditions needed to deal with the unforecasted increase in the water supply in the Delta.

⁶We also identified eight other instances of consultations between NMFS and federal agencies, but NMFS determined that none of the proposed federal actions would jeopardize the winter-run chinook salmon.

⁷Before 1991, Reclamation had conferred with NMFS on limited aspects of the CVP's operations affecting the salmon's survival. In April 1991, Reclamation requested formal consultation with NMFS on the impact on the winter-run salmon of the CVP's overall operations. Reclamation's action followed a February 1991 request from NMFS and a March 1991 notice from the Sierra Club Legal Defense Fund of its intent to file a lawsuit against Reclamation for violations of the ESA.

⁸NMFS' consultations with Reclamation on the CVP's operations also applied to the State Water Project's operations in the Delta, since the projects are managed cooperatively.

- In March 1992, Reclamation obtained NMFS' concurrence with Reclamation's plans to deliver additional water to the CVP's customers. However, several weeks later NMFS and Reclamation learned that the increased pumping had created some unexpected changes in the water flows in the Delta. As a result, juvenile salmon, which have limited swimming ability, were carried along by the flow, and up to 20 percent of the 1992 winter-run salmon were lost at the pumps.⁹ According to NMFS officials, the 20-percent loss was more than the "small percentage" the Service had authorized Reclamation to take, and the change in water flows due to the increased pumping in the Delta should have triggered a reopening of the consultations. According to Reclamation, however, it first learned that the number of salmon taken might be higher than anticipated at the same time NMFS learned of this problem from a state fisheries agency. By that time, most of the large loss had already occurred.
- According to NMFS officials, the biological opinion did not specifically require Reclamation to monitor changes from what was described in the opinion regarding water delivery rates, water conditions, or the CVP's operations. In addition, officials from both Reclamation and NMFS agreed that neither agency was sufficiently knowledgeable at the time about how changes in water flows would affect the migration of the salmon.
- NMFS' biological opinion called for the temperature of the river water in a portion of the spawning grounds not to exceed 56 degrees Fahrenheit between April 15 and September 30, 1992. To meet this condition, Reclamation needed to make timed releases of cold water from the CVP's reservoirs upriver from the spawning grounds. However, because of unseasonably warm weather, this temperature standard was not met during parts of June through September. A Reclamation official stated that Reclamation's analysis had indicated that the temperature standard would be achieved. However, a NMFS official said that Reclamation's procedures for managing the water temperature had not been flexible enough to meet contingencies.

Reclamation and NMFS officials stated that this experience in 1992 enabled them to develop better criteria for the CVP's 1993 operations. In February 1993, NMFS issued a biological opinion covering the project's operations in 1993 and subsequent years. This opinion incorporated 20 different potential operational environments that Reclamation had developed following the 1992 experience. NMFS established conditions addressing each of the operational environments and clarified the

⁹Reclamation and California's Department of Water Resources believe that NMFS' methodology for estimating salmon losses likely overstated the losses at the Delta pumps. In April 1994, NMFS and other agencies involved in monitoring the losses agreed to reevaluate the data and introduce any changes in the methodology for estimating losses for the 1995 season.

circumstances under which consultations would need to be reopened. For example, the opinion identifies specific operational environments that should trigger a reopening of consultations about maintaining the desired water temperatures in the salmon's spawning grounds.

According to NMFS, Reclamation complied with the agreed-upon conditions for operations in 1993 and through May 1994. More specifically, Reclamation reinitiated consultations with NMFS when required to do so, and pumps were shut down in the Delta for a number of days in February and March 1993 to avoid exceeding the allowable take of winter-run salmon. Also, according to a Reclamation official, the agency currently attempts to maintain the water temperature of the spawning grounds one-half degree below the required standard to afford a greater degree of flexibility.

NMFS' Protective Actions Also Affected Other Entities

NMFS' actions affecting nonfederal entities have included instituting legal proceedings against the Glenn-Colusa Irrigation District and assessing a \$50,000 fine against the Anderson-Cottonwood Irrigation District. In both districts, pumping for irrigation was resulting in illegal taking of winter-run salmon.¹⁰ NMFS also fined two private fishermen for illegally taking winter-run salmon on the Sacramento River.

NMFS' Actions Affecting the Glenn-Colusa Irrigation District

The Glenn-Colusa Irrigation District is a large privately operated diverter of water on the Sacramento River. The district contracts with Reclamation to divert water from the river to farmland in Glenn and Colusa counties. The district's peak irrigation season is from April to October. Because the district's pumping facilities had historically presented a hazard to migrating salmon, the California State Department of Fish and Game installed a fish screen in 1972 to keep fish away from the pumps. However, the district's pumping operations continued to cause significant losses of fish—including the winter-run salmon—primarily because the juvenile salmon were being pinned or battered against the screens by the current during pumping.

In December 1989, the district applied to the U.S. Army Corps of Engineers to renew a dredging permit in order to maintain the river channel leading to its pumping facility. The Corps, in turn, consulted with NMFS before renewing the permit, as required by the ESA. Following the consultation,

¹⁰We also identified six instances in which NMFS determined that actions proposed by nonfederal entities would not threaten the winter-run salmon.

NMFS issued a biological opinion in May 1991 concluding that the Corps' approval of the dredging permit would jeopardize the survival of the winter-run salmon. NMFS identified reasonable and prudent alternatives for the district to consider, including the installation of new fish screens. NMFS also said it would allow some incidental taking of winter-run salmon by the district provided the new fish screens operated as expected.

The district, however, contended that the state was responsible for replacing the screens. It said that in any case, it could not afford the estimated \$26 million cost of the screens. NMFS informed the district that until an agreement was reached and a permit issued for the incidental taking of salmon, the district could violate the ESA by continuing to pump. Alternatively, NMFS proposed that the district decrease its pumping to lessen the risk that the juvenile winter-run salmon would be pinned against the fish screens while migrating past the pumping facilities.

After further discussions, the district notified NMFS that it would not limit its pumping, and NMFS referred the matter to the Department of Justice for legal action. In August 1991, Justice filed suit against the district and sought an injunction to prevent further pumping. A federal district court granted a temporary restraining order. It subsequently found the district to be in violation of the ESA and granted a permanent injunction against any pumping until the district reached an agreement with NMFS. Subsequently, NMFS and the district resumed discussions and reached an agreement. Under the agreement, the district has resumed pumping at a reduced level and, with NMFS' approval, has installed an interim fish screen.

A long-term solution to the problem of fish screens at the district's pumping facility was addressed in the Central Valley Project Improvement Act of 1992 (P.L. 102-575). The act authorized Reclamation to fund 75 percent of the cost of any new screens. Reclamation is currently preparing an environmental impact study to identify a permanent solution to the problem and received \$2.75 million in fiscal year 1994 to begin work on the project. The district, as required by a court order, is to contribute \$5.5 million to a fund for constructing new fish screens.

NMFS' Actions Affecting the Anderson-Cottonwood Irrigation District

The Anderson-Cottonwood Irrigation District operates two water diversion facilities on the upper Sacramento River near Redding, California, the primary spawning area of the winter-run salmon. Because young salmon cannot swim well, they can be drawn by the current toward the district's irrigation pumps. One of the district's two diversion facilities

does not have either (1) a fish screen or (2) a bypass system that would allow fish drawn through the pumps into the irrigation canal to return to the river.

In 1990, California proposed the installation of a fish screen, funded by the state, at the unscreened diversion facility, but the district and the state could not agree on some details of the proposal. Subsequently, in September 1991, the state filed suit against the district, in state court, to enjoin the district from diverting water until it implemented measures to avoid the incidental taking of winter-run chinook salmon, as prohibited by the California Endangered Species Act.¹¹ Concurrently, the state had been collecting data on the extent to which the illegal taking of winter-run salmon was occurring at the district's diversion facility.

On the basis of the state's data and NMFS' expectation that the illegal taking would continue, in December 1991 NMFS notified the district that it was violating the ESA and initially levied a \$700,000 fine. The amount of the fine was based on 28 violations at the maximum penalty of \$25,000 per violation for each of the 28 days on which illegal taking had been documented. NMFS levied the maximum penalty, according to officials, because the district could have prevented or reduced the illegal taking by cooperating with the state and allowing construction of the fish screen. The district subsequently negotiated with NMFS to reduce the amount of the fine to \$50,000, and the district agreed to install a fish screen.

NMFS' Actions Affecting Private Individuals

In November 1992, responding to a tip from some fishermen, NMFS cited a professional fishing guide and his customer for catching winter-run salmon in violation of the ESA and levied fines totaling \$3,750.¹² According to NMFS officials, the Service took this enforcement action to send a strong message to other fishermen who might be fishing in the salmon's spawning grounds.

Agency Comments

We discussed the information contained in this report with the Branch Chief-Protected Species of the Southwest Region of NMFS' Office of Protected Resources and the Deputy Director for Administration and other

¹¹When the state trial court refused to issue an injunction to halt pumping by the district, the state appealed. The court of appeal ordered the trial court to grant a preliminary injunction, holding that taking an endangered species, under the state act, includes the killing of fish incidental to lawful irrigation activity.

¹²A photograph taken by one of the fishermen provided NMFS with evidence of the illegal take.

officials of Reclamation's Mid-Pacific Region. These officials generally agreed with the factual information presented. On the basis of their comments, we made changes where appropriate. As agreed with your office, we did not obtain written comments on a draft of this report from the agencies and organizations we contacted.

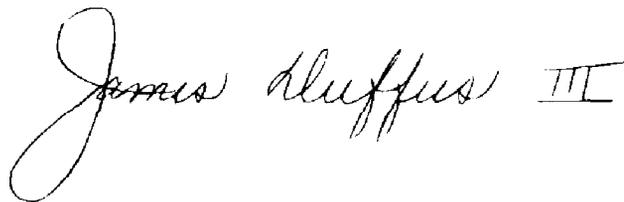
Scope and Methodology

We conducted our review between January and March 1993 and between January and May 1994 in accordance with generally accepted government auditing standards. To determine how NMFS' actions to protect salmon affect federal and nonfederal entities, we examined NMFS' files on the winter-run salmon and met with NMFS officials. To obtain information about the specific problems threatening the winter-run salmon at federal and state pumps in the Delta and at the Glenn-Colusa Irrigation District's facility in Hamilton City, California, we visited the facilities; met with NMFS, Reclamation, and state water and fisheries officials; and met with district representatives knowledgeable about conditions at the district's facility. We also interviewed representatives of several environmental groups and reviewed public records of the federal government's legal action against the district.

As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. At that time, we will send copies to the Secretaries of the Interior and Commerce and to the Directors of the Bureau of Reclamation and the National Marine Fisheries Service. We will also make copies available to others on request.

Please contact me on (202) 512-7756 if you or your staff have any questions. Major contributors to this report are listed in appendix I.

Sincerely yours,

A handwritten signature in cursive script that reads "James Duffus III". The signature is written in black ink and is positioned to the right of the typed name.

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