

APPENDIX A
1981 Secretarial Decision

SECRETARIAL DECISION

ALTERNATIVES FOR INCREASING RELEASES TO THE TRINITY

- _____ 1. 120,500 acre-feet annual releases in all years (no action alternative)
- _____ 2. 215,000 acre-feet annual releases in all years
- _____ 3a. 287,000 acre-feet annual releases in all years
- _____ 3b. 287,000 acre-feet annual releases in normal water years with reduction to 120,500 acre-feet in dry and critically dry years
- _____ 4a. 340,000 acre-feet annual release in all years
- _____ 4b. 340,000 acre-feet release in normal water years with reduction to 120,500 acre-feet in dry and critically dry years
- _____ 4c. 340,000 acre-feet annual release in normal years; 220,000 acre-feet dry years; 140,000 acre-feet critically dry years



Modified 4c. * WPRS will allocate CVP yield so that releases can be maintained at 340,000 acre-feet annually in normal years. FWS will prepare a detailed study plan to assess the results of habitat and watershed restoration. Prior to completion of the plan, releases will be 287,000 acre-feet. Releases will be incrementally increased to 340,000 acre-feet as habitat and watershed restoration measures are implemented. In dry years, releases will be 220,000 acre-feet; 140,000 acre-feet in critically dry years.

* (It is understood that no water allocated to the fishery under this agreement may be permanently allocated for any other purpose until the report provided for in paragraph (3) of the 12/30/80 Memorandum of Agreement has been acted on by the Secretary.

- _____ 4d. 340,000 acre-feet annual release in all years until "interim water" is exhausted; thereafter, same releases as Alternative 4c.

1-14-81

DATE



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SECRETARIAL ISSUE DOCUMENT
TRINITY RIVER FISHERY MITIGATION

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III. ALTERNATIVES FOR INCREASING RELEASES TO THE TRINITY

- 1. 120,500 acre-feet annual releases in all years (no action alternative)
- 2. 215,000 acre-feet annual releases in all years
- 3a. 287,000 acre-feet annual releases in all years
- 3b. 287,000 acre-feet annual releases in normal water years with reduction to 120,500 acre-feet in dry and critically dry years
- 4a. 340,000 acre-feet annual release in all years
- 4b. 340,000 acre-feet release in normal water years with reduction to 120,500 acre-feet in dry and critically dry years
- 4c. 340,000 acre-feet annual release in normal years; 220,000 acre - feet dry years; 140,000 acre-feet critically dry years (identified in the EIS as the proposed action).
- Modified 4c. Alternative 4c as modified by agreement between FWS and WPRS
- 4d. 340,000 acre-feet annual release in all years until “interim water” is exhausted; thereafter, same releases as Alternative 4c

ATTACHMENTS

Agreement Between FWS and WPRS for Implementing and Evaluating Increased Stream Flows for the Trinity Division, Central Valley Project, California

Final Environmental Impact Statement on the Management of River Flows to Mitigate the Loss of the Anadromous Fishery of the Trinity River, California (FES #80-52)

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SECRETARIAL ISSUE DOCUMENT

TRINITY RIVER FISHERY MITIGATION

I. INTRODUCTION

This SID concerns the operation of the Trinity River Division of the Central Valley Project in California. Since completion of the Division, over 80% of the mean runoff of the Trinity watershed above Lewiston Dam has been diverted to the Sacramento watershed for agricultural, hydroelectric, and other uses. This diversion has been accompanied by a severe decline in anadromous fish runs in the Trinity and Klamath Rivers. At issue are the quantity of water to be diverted and the quantity to be allowed to flow through its natural course for preservation and enhancement of anadromous fish runs on the Trinity and Klamath Rivers. Lead Assistant Secretary for this SID is the Assistant Secretary — Indian Affairs because of the federal trust responsibility to protect the fishing rights of the Hupa and Yurok tribes of the Hoopa Valley Indian Reservation.

This SID is a revision of a draft SID on the same subject distributed for review on January 8, 1980. Review of the earlier SID resulted in a decision by the Secretary, recorded in a memorandum dated April 18, 1980 (See Appendix 10 in the EIS), to increase releases from Lewiston Dam into the Trinity River during the current year (through April 30, 1981) and to prepare an environmental impact statement (EIS) prior to a decision by the Secretary on a permanent commitment of water for Trinity River Flows. The Fish and Wildlife Service (FWS) was directed to be the lead agency for the EIS, with the Bureau of Indian Affairs (BIA) and the Water and Power Resources Services (WPRS) directed to act as cooperating agencies. The draft EIS was released to the public on August 29, the comment period closed on October 17, the final EIS was filed with the Environmental Protection Agency on December 5, and a notice of availability was published in the Federal Register on December 12. The final EIS is attached to this SID. This SID constitutes the record of decision for the EIS. Because most of the information contained in the previous draft SD has been incorporated into the EIS, the discussion in the present SID has been substantially condensed.

The final EIS discusses eight alternatives, including the “no action” alternative. One of these, Alternative 4c, is identified as the proposed action. Following distribution of this SD in draft form on December 19, 1980, FWS and WPRS entered into an agreement, through which both agencies express a preference for a modified version of Alternative 4c. A copy of the agreement is attached to this SID. The primary purpose of the agreement is to aid in the implementation of Alternative 4c, in the event that the Secretary selects that alternative. The agreement contemplates a twelve year study period during which, in order to complement increased stream flows, an overall fish and wildlife management plan would be implemented by the member agencies of the Trinity River Basin Fish and Wildlife Task Force. All of the alternatives, except no action, assume that such a plan to improve habitat would be implemented. However, only the modified 4c specifies that the decision made based on this SID will be reviewed at a future date, i.e., 12 years after implementation.

II. BACKGROUND

A. HUPA AND YUOK FISHING RIGHTS

For hundreds of years the Hupa, Karuk, and Yurok Indian tribes have resided along the Trinity and Klamath Rivers and their tributaries and have utilized the fishery in the practice of their religion, in barter, and as a principal food source. The achievement of wealth and status and the pursuit of enterprise were vital aspects of the traditional cultures of these tribes, and these aspects of culture were largely based upon the abundance of salmon. To protect fundamental tribal rights, including utilization of the fishery, Federal reservations were created during the 1855-1891 period pursuant to Congressional authority. (See Sections C7.O and D5.3 of the EIS.)

Secretarial responsibilities regarding tribal fishing rights and tribal entitlement to water to provide a viable fishery have been extensively outlined in a memorandum dated March 14, 1979, from the Associate Solicitor, Division of Indian Affairs to the Assistant Secretary - Indian Affairs. This memorandum states, in part:

“It has been clearly established in the courts that an important ‘Indian purpose’ for the creation of both the initial reservation and the subsequent extension was to reserve to the tribes occupying the reservation the right to take fish from the Klamath and Trinity Rivers. Mattz v. Arnett, 412 U.S. 481 (1973); Arnett v. 5 Gill Nets, 48 Cal. App.3d 459 (1975); Donahue v. Justice Court, 15 Cal. App.3d 557 (1971).

“It is also well established that when federal reservations are created pursuant to Congressional authority, the Federal Government reserves the use of such water as may be necessary for the purposes for which the reservation was created. Winters v. United States, 207 U.S. 564 (1908); Arizona v. California, 373 U.S. 546 (1963); Cappaert v. United States, 426 U.S. 128 (1976); United States v. New Mexico, 98 5. Ct. 3012 (1978).

“Both the tribal rights to fish and to the water needed to make the fishing right meaningful are tribal assets, which the Secretary has an obligation as trustee to manage for the benefit of the tribes. A trustee has a duty to exercise such care and skill as a person of ordinary prudence would exercise in dealing with his or her own property. Restatement (Second) of Trusts (1959) (hereinafter Trusts) Sec. 174. This obligation includes both the duty to preserve the trust assets and to make them productive. Trusts Sec. 181. The most fundamental duty of the trustee, however, is loyalty to the beneficiary. The trustee must administer trust assets solely in the interests of the beneficiary. Trusts Sec. 170.

“These basic principles of trust law have been applied in recent years in the context of federal Indian law by the United States Supreme Court, United States v. Mason, 412 U.S. 392 (1973), by the federal trial court that has the Hoopa Valley Indian Reservation within its district, Manchester Band of Pomo Indians v. United States, 363 F. Supp. 1238 (N.D. Cal. 1973), by

the Court of Claims in a case involving Indians living on that reservation, Coast Indian Community v. United States, 550 F.2d 639 (Ct. Cl. 1977), and by the federal district court for the District of Columbia with respect to Interior Department operating criteria for a dam that diverts water away from the Indian reservation where it is needed to preserve fish stocks for Indian use, Pyramid Lake Paiute Tribe of Indians v. Morton, 354 F. Supp. 252 (D. D.C. 1973).”

To summarize, the Hupa and Yurok Indians have rights to fish from the Trinity and Klamath Rivers and to adequate water to make their fishing rights meaningful. These rights are tribal assets which the Secretary, as trustee, has an obligation to manage for the benefit of the tribes. The Secretary may not abrogate these rights even if the benefit to a portion of the public from such an abrogation would be greater than the loss to the Indians.

Since 1977 the Department has been regulating Indian fishing on the Hoopa Valley Reservation in order to conserve the fish resources. In 1976, the United States Supreme Court declined to review the decision of a California appellate court in Arnett v. 5 Gill Nets that the State of California could not regulate Indian fishing on the Hoopa Valley Indian Reservation. Because the Yurok Tribe, which shares the reservation with the Hoopa Valley Tribe, has no organized tribal government, tribal regulation of the fishery was not possible. Since neither state nor tribal regulation was possible, the Interior Department used its regulatory authority to assure the preservation of the fishery on which the Indians of that reservation depend. In 1978, efforts to enforce these regulations met with bitter and sometimes violent resistance.

Prosecutions in the Court of Indian Offenses were vigorously defended by lawyers for the Indian fishers. Attorneys challenged the validity of the regulations, citing language in the preamble stating that a major problem affecting the fishery results from the substantial diversions of water from the Trinity River and that “regulation of the Indian fishery will provide only a small degree of protection for this resource.” Defense attorneys argued that the Department has a trust obligation to halt other threats to the fishery rather than placing the entire conservation burden on the Indians. The Department decided that immediate action had to be taken with respect to such threats because of their potential to totally destroy the resource in a short time. The Indians were told that regulation of their fishing was needed to give the Department the time it needed to deal with the other problems.

The regulations currently in effect, which were promulgated in March 1979, permit the taking of fish for subsistence and ceremonial purposes, but, because of the decline in the state of the resource, do not permit the taking of fish for commercial purposes. If restoration of the fish habitat results in such increases in fish populations that the ban on commercial fishing can be lifted, then important economic and cultural benefits could be realized by the Hupa and Yurok Tribes (see Section D.5.3 of the EIS). To illustrate the potential economic benefit, the EIS predicts that the proposed action would allow Indians to catch an additional 10,260 salmon per year. Approximately 5,700 to 8,700 would be

required to restore the tribes to the level of fish of North Fork Trinity River origin that were historically harvested for subsistence needs. Approximately 1,560 to 4,560 would then be available for commercial purposes. The economic benefits would depend on how the fish were marketed.

Any substantial economic benefits would help to improve the quality of life on the reservation, where unemployment is between 37 and 45 percent and the per capita income is less than half the national average (see Section C.7.4 of the EIS). Perhaps more important than economic benefits would be cultural benefits to the tribes if the fishery is restored. Regardless of whether the ban on commercial fishing is lifted, the fishery could provide for more of the subsistence needs of tribal members. For tribal members faced with the choice of leaving the reservation to gain employment or remaining on the reservation where employment opportunities are few but family and cultural ties are strong, the restoration of the fishery would likely result in more tribal members choosing to stay on the reservation, in effect, practicing “nature banking” as described in the EIS (EIS, p. C7 - 8). If the natural resource base of the reservation substantially contributes to the subsistence needs of tribal members, and if providing for subsistence needs is done in ways which are part of the tribes’ cultural traditions, such as harvesting salmon, then the cultures of the tribes will be more resilient in reacting to outside forces of cultural change.

B. TRINITY RIVER DIVISION

As early as 1931 the water development potential of the upper Trinity River was recognized. Plans for diversions to the Central Valley were formulated as part of the California State Water Plan. With the strong urging of the State of California, the U.S. Bureau of Reclamation (now WPRS) released preliminary plans for development of the river as part of the Central Valley Project (CVP), and in 1955 the Trinity River Division of the CVP was Congressionally authorized (Trinity River Act, P.L. 84 - 386).

The Secretary has authority under the Trinity River Act to mitigate losses of fish resources and habitat and provide for certain downstream water uses. The mandate that the operation of the Division be integrated with other CVP features to achieve the fullest, most beneficial, and most economic use of the developed water is qualified by Section 2, which states:

“Provided, that the Secretary is authorized and directed to adopt appropriate measures to insure the preservation and propagation of fish and wildlife, including, but not limited to the maintenance of the flow of the Trinity River below the diversion point at not less than one hundred and fifty cubic feet per second for the months of July through November . . .”

Recent opinions of DOI’s Regional Solicitor in Sacramento and earlier reports of the Commissioner of Reclamation acknowledge the mandatory requirement of this proviso. The Secretary has acknowledged this responsibility in the April 18, 1980, memorandum noted earlier.

Construction of the Trinity River Division began in 1956, with water first impounded in 1960. Constructed features include: (1) Trinity Dam (Clair Engle Lake) on the Trinity River - with a capacity of 2.5 million acre-feet; (2) Lewiston Dam (and Reservoir), a flow regulating lake seven miles below Trinity Dam; (3) Trinity River Fish Hatchery immediately downstream from Lewiston Dam; (4) Whiskeytown Dam (and Lake) on Clear Creek, a tributary of the Sacramento River; and (5) two transmountain tunnels and four hydroelectric plants (two each in the Trinity and Sacramento Basins) - with a combined generating capacity of 397,000 kilowatts. (In the EIS, see Plate 2 of Appendix 1 and Section C.2.O.)

Diversions to the Sacramento River Basin commenced in 1963 and full operation began in 1964. Total annual releases downstream from Lewiston Dam were to be a minimum of 120,500 acre-feet, or approximately 10 percent of average annual unimpaired flows. The releases represent approximately 2 percent of the CVP's 8.1 million acre-feet of firm yield.

C. DECLINE OF THE FISHERY

Prior to construction of the Trinity River Division, the Trinity River was recognized as one of California's most famous and accessible fishing streams. Since 1963 when the Trinity River Division was placed into operation, salmon and steelhead runs in the Trinity River system have undergone severe declines: approximately 80 percent in the case of chinook salmon (from 50,000+ spawners to 11,100), and approximately 60 percent for steelhead trout (from 24,000+ to 10,000). This downward trend has occurred despite the provision from the time of project inception of flows to protect prime spawning and rearing habitat in 40 miles of the Trinity River below Lewiston Dam, the primary diversion structure, and the operation of a hatchery to replace 109 miles of upstream spawning and rearing habitat rendered inaccessible by the dam.

Both the quantity and the quality of fish habitat have been significantly diminished since pre-project periods. Temperature and turbidity levels have at times been higher than under pre-project conditions. Sand has filled pools and covered "riffles" important for the production of fish. Portions of the riverbed have become compacted and unusable for spawning and provide only limited fish food production. Reduced flows have also allowed the encroachment of riparian vegetation along the channel where it had not previously existed. A current estimate places spawning habitat losses at 80 to 90 percent even though a dozen spawning riffles have been rebuilt by the Trinity River Task Force. Given declines in salmon and steelhead numbers that have occurred since, overall fish habitat has likely declined by a larger proportion. The existing environment (post-project) can be described based on conditions measured by a 1978 flow study, documented in Hoffman, J. (USFWS), Trinity River Instream Flow Study: Final Report to the Task Force (1980). This study measured amounts of "weighted usable habitat" for adult, spawning and juvenile rearing purposes in selected representative study areas. The existing environment represents significant reduction in wetted area, spawning habitat, adult holding habitat, juvenile rearing habitat, increased (adverse) water temperatures at certain times, and decreased attraction and downstream transport flows relative to pre-project conditions.

Abusive logging practices, improper road construction, and floodplain development within the Trinity watershed have also contributed significantly to habitat degradation. Clearcutting has promoted increased sediment loading; removal of streamside vegetation has increased water temperatures; log jams at the mouths of tributary streams have blocked access for fish spawning and rearing. Logging within the basin has necessitated the construction of hundreds of miles of unpaved logging roads and skid trails. The resulting increased yield of sediment in the mainstem Trinity and its tributaries has reduced the biological productivity and fish carrying capacity of the stream.

Sustained high harvest pressure is also believed to have contributed to the decline of the fish runs on the Trinity. The bulk of the chinook salmon harvest occurs in the ocean fishery with commercial trollers accounting for an estimated 68 percent of the harvest and ocean sport fishers taking 20 percent of the fish. The remaining 12 percent are harvested in the river fishery, with Indians taking 10 percent and sport fishers the remaining 2 percent. The steelhead trout fishery is strictly a river fishery which is divided between sport (90 percent) and Indian harvesters (10 percent). The catch-spawning escapement ratio for fall run chinook is on the order of three to one, which means that, on the average, 25 percent of the adults return to spawn. For steelhead trout, it is estimated that perhaps 50 percent of the returning adults are taken.

In developing a stream management plan in this area it should be assumed that good management practices will be utilized regarding the ocean fishery. Data reflect that salmon harvest related to this system has been stable over the last decade, yet salmon populations continue to decline. This and other data has led to the hypothesis that the present declines in chinook salmon are, in the largest part, due to habitat loss and deterioration rather than the long term harvest rates. Therefore, further reduction of ocean harvest rates is not considered an alternative to increasing instream flows. It should also be noted that issues related to the allocation of the harvest between the ocean and Indian fisheries are currently in litigation. The outcome of this litigation will affect the allocation of benefits resulting from any increased flows.

Expanded hatchery operations have been advocated by some as an alternative to increased flow releases. Hatchery expansion could theoretically increase the size of salmonid runs, however, increased flow releases would also be required to provide adequate river conditions for fish passage to and from the Trinity River. Past experience indicates anadromous fish hatcheries and similar facilities in California have generally been unsuccessful in meeting their objectives. The one exception is the Nimbus Hatchery on the lower American River which has had the advantage of near optimal stream-flows for rearing and migration since its construction. As sections BI.0 and C4.113 of the EIS notes, the success of the Trinity River Fish Hatchery cannot be positively demonstrated. Other reasons for preferring natural runs over hatchery bred fish are: the frequently devastating losses of young fish in hatcheries due to diseases; the greater genetic diversity maintained in wild stocks, the fact that hatcheries would be species specific (anadromous species) and would not contribute to the general needs of other fish and wildlife species which rely on the Trinity; and hatchery expansion would be inconsistent with Fish and Wildlife Service and California Department of Fish and Game policies which emphasize preservation of natural runs.

To summarize the condition of the fishery, the body of knowledge that has emanated thus far from the Trinity River Task Force has made clear beyond doubt that the decline in salmon and steelhead stocks is due fundamentally to three causative factors, and that the decline will continue toward virtual extirpation of the stocks unless significant corrective measures are applied. The fundamental causes of the fishery decline are excessive streambed sedimentation, inadequately regulated harvest, and insufficient streamflow. Restoration of salmon and steelhead populations to pre-project levels will require alleviation of each of these resource-limited factors. The course of action proposed in the EIS addresses what is believed to be the most critical of the limiting factors, i.e., insufficient streamflow. Restoration of streamflow is a necessary first step in rejuvenation of the fishery (For a thorough discussion of fishery issues, see Sections C.4 and D.5 of the EIS.)

D. TRINITY RIVER BASIN FISH AND WILDLIFE TASK FORCE

A state-federal work group and task force comprised of USBR, USFWS, and the California Department of Fish and Game (CDFG) was formed in 1971 to study more broadly the fish and wildlife problems of the basin. In 1972 funds were provided through the USBR to the CDFG and the USFWS to prepare a plan for identification and mitigation of fish and wildlife problems. Initial physical restoration of spawning areas near Lewiston was carried out in 1972 and 1973 under the auspices of the task force.

Trinity River conditions continued to worsen and in 1974 the public's growing concern regarding the decline of the endangered fishery activated the interest of Congressman Harold T. (Bizz) Johnson, in whose district the project is located. The membership of the Trinity River Basin Fish and Wildlife Task Force (Task Force) was subsequently expanded to develop and implement immediate and long-range restorative actions. Members of this multi-agency committee now included the USBR (i.e. WPRS), CDFG, USFWS, BIA, the California Department of Water Resources (DWR), Trinity County, Humboldt County, Hoopa Valley Business Council, the United States Forest Service (USFS), the United States Bureau of Land Management (BLM), and the United States Soil Conservation Service (SCS). The Task Force was expanded again in 1978 to include the California State Water Resources Control Board (SWRCB) and the National Marine Fisheries Service (NMFS) for a total of 13 entities.

The WPRS is the Task Force's lead agency and receives federal funds to carry out the Trinity River Basin Comprehensive Action Program with the assistance of other members of the Task Force. In Fiscal Year 1975, Congress authorized appropriations of \$300,000 as the first part of a \$7.6 million program scheduled for eight years. A five-year Interim Action Program was then begun in an effort to stem the further immediate decline of the fish and wildlife resources, while completing formulation of a comprehensive long-term cooperative management program.

Numerous Task Force studies and activities have been conducted, including watershed revegetation to control erosion, mechanical restoration of mainstem riffle and pool habitat, tributary stream improvement, hatchery operation assessments, sediment transport and removal studies, and fish population, migration and harvest assessments. In 1978, consultants were contracted to formulate specific management options for inclusion in the fish and wildlife program, to address questions of an institutional nature bearing on the program, and to prepare an overall management plan proposal for the Trinity River Basin. Substantial additional funding and personnel commitments at national, state, and local levels may be required to implement the management plan once it is completed and approved by the Task Force.

Without increased streamflows to improve fishery habitat and fish production, the actions outlined above (regarding land use and fish harvesting) will produce only limited improvements. Since the initiation of project operations in 1964, both CDFG and later the Task Force have made numerous attempts to secure an increase in flow releases down the Trinity River. In response, the minimum annual release of 120,500 acre-feet from Lewiston Reservoir was approximately doubled in 1974 and 1975 as part of a three-year experiment. The experimental release period, interrupted by a severe drought in 1976 and 1977, extended into early 1979. (These releases were extended on a voluntary basis by USBR into early 1980.) In a letter to CDFG dated March 3, 1977, the Regional Director, WPRS stated:

“It appears that the Secretary (of the DOI) already has authority to provide added fish flows above the ‘minimum’ provided in the authorizing legislation. The level of flows required should be documented as a part of the Trinity River Basin Fish and Wildlife Action Program. At the same time such documentation of flow needs is satisfactorily completed, the Secretary can make the decision to provide the higher level of flows. I would support such a change in operation to provide those higher flows.”

The Task Force, in an effort to provide the prerequisite documentation and complete the formulation of a basin management plan, initiated studies by private consultants (FK and VTN), CDFG, DWR, and USFWS. The USFWS study is the basis for a current flow regime of 286,700 acre - feet implemented in May 1980 and to be in effect through April, 1981 (as established by the Secretary). The FWS study plus the results of the other studies, as completed to date, are the basis of the alternatives considered in the EIS and presented to the Secretary in this SID.

The October 1980 report by Frederiksen, Kamine and Associates (FK) is the most recent of the studies completed for the task force. In its report FK has indicated that the anadromous fisheries of the Trinity River Basin could be restored with the implementation of a 14 - action program which includes increased downstream releases and watershed and habitat restoration efforts. FK recommends two levels of downstream releases, 260,000 acre-feet annually in normal and wet years, and 179,800 acre-feet in dry years. The recommendations which are currently under consideration are not identical to those recommended in the EIS and this SID, however, the 14 - action program including the FK recommendation for increased flows will be valuable to the task force in formulating its management program as well as FWS and WPRS in its assessment of the effectiveness of the flow releases and watershed and habitat restoration studies as detailed in the agreement executed between the two agencies.

E. IMPACTS ON THE CENTRAL VALLEY PROJECT

The Trinity River Division is an integral part of the CVP, and was the first major water development project in northwestern California constructed and operated to export water. Runoff water from the Trinity Basin is stored, regulated, and diverted through a system of dams, reservoirs, tunnels, and powerplants to the Sacramento River for use in water deficient areas of the Central Valley Basin. Currently, about one million acre-feet of water are exported annually from the Trinity Basin. This represents approximately 14 percent of the CVP's "firm yield" water supply of 8.1 million acre-feet. The diverted water supplies total irrigation needs equivalent to about 333,000 acres and approximately 100,000 additional acres through the use of return flows. The affected acreage is in the Sacramento, San Joaquin, and Santa Clara Valleys.

In addition to agricultural benefits, the Trinity Division also supplies a major source of hydroelectric generating capacity. The Trinity Division includes four powerplants which are operated in conjunction with the water demands for irrigation. Power generated is directly related to the demands for project water. Since the greatest diversions are made during the summer months when irrigation needs are greatest, these months also represent the period when maximum amounts of hydroelectric energy are generated. The energy provides "peaking power" to Central Valley users, which include primarily irrigation districts, municipalities, military installations, and other Federal agencies. The average annual generation of the Trinity Division is about 1.1 billion kwh. This compares with an average annual generation of 5.5 billion kwh for the CVP.

A decision to increase flow releases to the Trinity River for fishery conservation purposes reduces the supply of water available for irrigation and power production. The impact of a decrease in agricultural water supply under the various alternatives can be represented in terms of acres which could not be irrigated and corresponding agronomic losses. The range of impacts for the alternatives considered is summarized in the next section of this SID and is thoroughly discussed in Section D.3 of the EIS.

Increased flow releases to the Trinity River would also have a negative impact on CVP power benefits. Every acre foot of water which is diverted from the Trinity River Basin generates 1,100 kwh as the water passes through three powerplants. Approximately that amount of energy would be lost for each additional acre-foot of water released down the Trinity. (The actual loss is somewhat less because the Lewiston Powerplant, with a present 350 kw installed capacity, would generate a small amount of electrical energy as waters were released down the Trinity.)

Additionally, downstream releases during dry or critically dry years would reduce the dependable capacity of the Trinity powerplants. (Dependable capacity is that portion of the powerplant's installed capacity in kilowatts that can be relied upon to meet preference customer loads under adverse hydrologic conditions.) The loss in decreased generation can be expressed in terms of the cost of foreign oil required to replace the lost energy (\$33 per barrel, based on April 1980 prices, or the cost of replacing generation through the use of coal, geothermal steam, or banked power transferred to Pacific Gas and Electric Company at times when CVP generation exceeds CVP demand). Because California's utility system is heavily based on oil-fired generation, power lost to Trinity releases would likely be replaced by combustion of oil, at least in the near term. The loss in decreased dependable capacity can be expressed in terms of the costs required to construct a new powerplant to replace the lost dependable capacity. These impacts are summarized in the next section of the SID and are thoroughly discussed in Section D.4 of the EIS.

III. ALTERNATIVES FOR INCREASING RELEASES TO THE TRINITY

As noted earlier in this SID, and as analyzed in the EIS, restoration of streamflow is a necessary first step in rejuvenation of the fishery. A number of other actions should also be taken, such as those recommended in the FK report (Proposed Trinity River Basin Fish and Wildlife Management Program). However, other actions will produce limited benefits without increased releases for streamflows. The draft SID which was circulated on January 8, 1980, led to a decision to prepare an environmental impact statement (EIS) prior to a decision by the Secretary on a permanent commitment of water to be released into the Trinity River to mitigate damage to the fishery. As a result of the scoping process, the options presented in the January 8 draft SID were modified somewhat. The alternatives analyzed in the EIS are as follows:

- Alt. 1 120,500 acre-feet annual releases in all years (no action alternative)
- Alt. 2 215,000 acre-feet annual releases in all years
- Alt. 3a 287,000 acre-feet annual releases in all years
- Alt. 3b 287,000 acre-feet annual releases in normal water years with reduction to 120,500 acre-feet in dry and critically dry years.
- Alt. 4a 340,000 acre-feet annual release in all years
- Alt. 4b 340,000 acre-feet release in normal water years with reduction to 120,500 acre-feet in dry and critically dry years
- Alt. 4c 340,000 acre-feet annual release in normal years; 220,000 acre-feet dry years; 140,000 acre-feet critically dry years (identified in the EIS as the proposed action)
- Alt. 4d 340,000 acre-feet annual release in all years until "interim water" is exhausted; thereafter, same releases as Alternative 4c

Section B of the EIS explains how these alternatives were developed as well as why other possible alternatives were discarded after initial consideration. Section B also contains a summary of the environmental impacts of each alternative (see pp. B-6 to B-13). These environmental consequences are thoroughly analyzed in Section D of the EIS. A brief summary is presented in this SID.

The FWS-WPRS agreement discussed earlier in this SID is in effect a modification of Alternative 4c, as follows:

Modified Alt. 4c. WPRS will allocate CVP yield so that releases can be maintained at 340,000 acre-feet annually in normal years. FWS will prepare a detailed study plan to assess the results of habitat and watershed restoration. Prior to completion of the plan, releases will be 287,000 acre-feet. Releases will be incrementally increased to 340,000 acre-feet as habitat and watershed restoration measures are implemented. In dry years, releases will be 220,000 acre-feet; 140,000 acre-feet in critically dry years.

The principal differences between the modified 4c and the original 4c is that in the modified version: (1) releases of more than 287,000 acre-feet in normal years would be conditioned on habitat and watershed improvements; and (2) the success of restoration efforts, including increased releases for streamflows, would be reviewed following a 12 year study period. All of the other alternatives, except no action, would involve an ongoing evaluation effort, but only the modified 4c specifies a time frame for the evaluation.

Increasing flow releases to the Trinity River would generally result in favorable environmental, social, and economic impacts in the Trinity River Basin. The primary effect of the proposed course of action, when coupled with an intensive streambed, watershed, and harvest management program, would be restoration of the anadromous fishery to levels approaching pre-project conditions.

A relative value index for habitat is useful for purposes of explaining the different impacts of the various alternatives on fish habitat. This approach must be exercised with caution, however, because of assumptions which must be made concerning the relationship among streamflows, habitat, and fish production. One of the assumptions used in developing this relative habitat index is that there is a direct linear relationship between flow and fish habitat and between fish production and fish habitat within the range of releases from 120,500 acre-feet to 340,000 acre-feet (see Section D5.211 in the EIS). Fishery habitat values, spawning run sizes, and partial increased economic values were estimated for each of the alternatives. These figures are shown in the table below.

Table 1
Chinook Salmon and Steelhead Trout Spawning
Escapement under Alternative Trinity Flow Releases

<u>Alt.</u>	<u>Average Annual Release (ac-ft)</u>	<u>Relative Habitat Index Value</u>	<u>Chinook Salmon Spawning Escapement</u>	<u>Steelhead Spawning Escapement</u>
1	120,500	.20	11,000	10,000
2	215,000	.54	32,100	17,600
3a	287,000	.81	42,600	21,300
3b	245,000	.65	36,400	19,100
4a*	340,000	1.00	50,000	24,000
4b	285,000	.80	42,200	21,200
4c	308,000	.88	45,300	22,800
4d	308,000	.88	45,300	22,800

*Spawning escapement predicted to be restored to estimated minimum pre-project levels based on Hoffman (USFWS), Trinity River Instream Flow Study (1980).

Salmon provides one-third of the economic value of the California commercial fishery and the North Coast constitutes the heart of this industry. Chinook salmon also help maintain an important sport fishery off the northern California coast. In addition, chinook salmon and steelhead trout represent the major contributors to the Trinity River sport fishery and are the heart of the Indian fishery. Restoration of this resource would benefit each of these major user groups.

The partial economic values for chinook salmon and steelhead trout fisheries attributable to the alternatives are displayed in the table below.

Table 2
Annual Net Increase in Economic Value of Trinity River
Chinook Salmon and Steelhead Trout Fishery
(millions of dollars) under Various Alternatives

<u>Alternatives</u>	<u>Chinook Salmon</u>	<u>Steelhead</u>	<u>Total</u>	<u>Compensation b/</u>
1 ^a	-0-	-0-	-0-	-0-
2	1.6	1.2	2.8	8.4
3a	2.3	1.8	4.1	12.3
3b	1.8	1.4	3.2	9.6
4a	2.9	2.2	5.1	15.3
4b	2.3	1.8	4.1	12.3
4c	2.5	2.0	4.5	13.5
4d	2.5	2.0	4.5	13.5

a/ The existing salmon fishery is valued at 0.8 million dollars and the steelhead fishery at 1.6 million dollars.

b/ The “willingness to pay” approach is useful in expressing the value of added commodities or uses. However, a different approach - “willingness to sell” - is needed to estimate the loss when a user is being asked to give up a commodity or use. For this SID, compensatory values are assumed to be three times the value that users are willing to pay.

Increasing flow releases to the Trinity River would also result in improved water quality in the mainstem downstream of Lewiston Dam and increased use of the Trinity River by recreationists engaging in fishing (other than for salmon and steelhead), swimming, canoeing, and whitewater rafting. Increased opportunity for whitewater rafting would afford a major recreational attraction. The best whitewater conditions occur in the early spring when heavy runoff enters the mainstem from tributaries; the release of higher flows from Lewiston Reservoir would extend the rafting season into the summer.

Increased fish numbers and fishing, better water quality, and increased recreation opportunities, would greatly benefit the tourism and recreational - support industries, a main source of income in both Trinity and Humboldt Counties.

Restoration of the anadromous fish runs, in addition to the economic benefits shown, would significantly benefit the Hupa and Yurok peoples who depend upon salmon and steelhead for their ceremonial and subsistence needs, as well as for commercial purposes.

The data presented in Table 1 indicate for each alternative, the probability that the fishery will recover to near project levels. The data in Table 2 indicate the economic benefits projected for each alternative. Tables 3 and 4 below, present data on the impacts on CVP water and power users. It might be noted that, as a result of the analysis conducted in preparing the EIS, the figures on agricultural impacts have changed substantially since the distribution of the previous SID on January 8, 1980.

Table 3 summarizes the analysis of projected agricultural economic losses, due to land which could not be irrigated, assuming that water conservation or alternative sources of water are not utilized to bring the land into production. Until the year 2000, there would be no specific Impacts on CVP water users during normal and dry water years under any of the alternatives, i.e., up to 340,000 acre-feet. During critically dry water years, all the alternatives would require placing deficiencies on water users; however, all water users or groups of users would share the deficiency. The deficiencies can be imposed under existing contracts. However, the situation will change when the ultimate requirements of project water users are to be met, beginning in the years 2000 - 2020. At that time, the deficiency criteria in water service contracts will need to be revised to reflect the impact on project yield if these releases continue at this level. (This assumes no construction of new facilities and a meeting of D - 1485 requirements.)

The net values associated with land not developed under each of the eight alternatives range from 0 to 4.1 million dollars annually, assuming that lands of average value per acre are not developed for agricultural production, or, alternatively, from 0 to 1.0 million dollars annually, assuming that lands generating the lowest income (irrigated pasture) are not developed. The ranges of value are displayed below. (Note: figures incorporate agricultural costs resulting from non-development of agricultural return flows of 17.5 percent.)

Table 3
Agronomic Losses in the Year 2020 Associated with Implementation
of Alternative Flow Releases

Alt.	Forgone (acres)	Net Agronomic Value	
		Average Value (millions of \$'s)	Lowest Value (millions of \$'s)
1	- 0 -	- 0 -	-0-
2	45,000	2.0	0.5
3a	79,000	3.4	0.9
3b	22,000	0.9	0.2
4a	95,600	4.1	1.0
4b	28,300	1.2	0.3
4c	42,300	1.8	0.5
4d	42,300	1.8	0.5

It should be noted when considering the loss figures indicated above that no residual value is assigned to lands not put into production. There is no way of predicting the uses that such lands would be put to and therefore no way of quantifying their residual value. However, some residual value would exist that would reduce the net losses described above.

Table 4 presents, data on the costs of replacing power losses, to both average annual generation and project dependable capacity.

Table 4
Power Losses Associated with Implementation
of Alternative Flow Releases (millions of dollars)

<u>Alt.</u>	<u>Oil</u>	<u>Coal</u>	<u>Geothermal</u>	<u>Banked Power</u>
1	- 0 -	- 0 -	- 0 -	- 0 -
2	7.0	5.1	3.6	3.1
3	12.2	9.1	6.4	5.6
3b	7.7	5.4	3.4	2.8
4a	16.2	12.1	8.6	7.4
4b	10.2	7.1	4.5	3.6
4c	11.3	7.9	5.0	4.1
4d	11.3	7.9	5.0	4.1

Some additional consequences (positive and negative) of the proposed action on the Central Valley Basin are not amenable to quantification. On the negative side is a reduction in the volume of Trinity River water entering the Sacramento River and thus potentially available for: (1) cooling Sacramento River water which tends in the late summer to fall to exceed the upper limit of the optimum range for salmon spawning, egg incubation and rearing; and (2) reducing the Sacramento River flow releases from Shasta Lake required for diluting high concentrations of copper and zinc in flows emanating from Spring Creek, a Sacramento tributary (it is anticipated that entry of these pollutants into Spring Creek from mining operations will ultimately need to be controlled through Implementation of the Clean Water Act). On the positive side, the reduction in the amount of colder Trinity River water flowing down the Sacramento River in spring could be a benefit since Sacramento River water temperatures tend to be below optimal for salmon at that time. Some additional minor benefit would accrue to reduced pumping in the Sacramento - San Joaquin Delta, where pumping operations of the CVP and the State Water Project have had massive adverse impacts on both fish and wildlife.

It is to be noted that for the purpose of judging the economic merit of the proposed course of action, application of the traditional benefit/cost analysis to the resource problem addressed in this EIS is not appropriate. Providing greater flows to the Trinity River below Lewiston Dam would be a loss - compensation measure, which is a feature of the Trinity River Division, not subject to a separate benefit/cost analysis. Moreover, as observed at the outset, there are responsibilities arising from congressional enactments, which are augmented by the federal trust responsibility to the Hupa and Yurok tribes, that compel restoration of the river's salmon and steelhead resources to pre-project levels.

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