Chapter 2
Changes to the DEIS/EIR

Chapter 2 Contents

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CHAPTER 2

Changes to the DEIS/EIR

2.1 Changes to the DEIS/EIR—Executive Summary

Introduction *(NO CHANGE)*
Purpose and Need for the Action *(SEE SUBSECTIONS)*

Tribal Trust
pg. ii

The Hoopa Valley Indian Reservation was established in 1864. The reservation generally consists of a ~~12-mile-square~~ 144-square-mile block of land bisected by the lower Trinity River. In 1988, Congress, via the Hupa-Yurok Settlement Act (P.L. 100-580), established the Yurok Indian Reservation, which is bisected by the lower Klamath River. Several court rulings have established that an important AIndian purpose@ for the reservations was to reserve the tribes= rights to take fish from the Klamath and Trinity Rivers.

Description of Alternatives *(SEE SUBSECTIONS)*

Preferred Alternative
pg. iv

The Flow Evaluation Alternative, coupled with additional watershed protection efforts (described in the Mechanical Restoration Alternative), was identified as the preferred alternative because it best meets the purpose, need, goals, and objectives, while also minimizing adverse impacts. In addition, the preferred alternative achieved the following screening criteria, which were jointly developed by the four co-leads (Service, Reclamation, Hoopa Valley Tribe, and Trinity County). The preferred alternative:

- Substantially increases natural production of anadromous fish on the Trinity River mainstem
- Substantially restores inriver and ocean fishing opportunities
- Improves tribal access to trust resources
- Balances environmental and social beneficial and adverse impacts across the Trinity River Basin, Lower Klamath River Basin/Coastal Area, and the Central Valley Basin while meeting the mandate from the SWRCB in Water Rights Orders 90-05 and 90-01 to cause no harm to the Trinity River fishery as a result of diversions to the Sacramento River for temperature control
- Allows for the continued operation of the TRD including water exports
- Limits flooding impacts on the Trinity River

pg. v

The following text has been added immediately above No Action Alternative:

The 600 thousand acre-feet (taf) carryover storage level associated with the Flow Evaluation Alternative would be maintained for the Preferred Alternative except in exceedingly dry years if deemed necessary to avoid potentially infeasible operations at Shasta Dam. In such years (identified as potentially occurring in the future per the modeling analysis under the cumulative scenario), carryover storage would be reduced to 400 taf.

pgs. vi through viii

Table ES-1 has been modified to include Hoopa Valley Tribe temperature standards and additional information, and to correct some values. See revised Table ES-1 at the end of this section.

Affected Environment and Environmental Consequences *(SEE SUBSECTIONS)*

Water Resources **(CHANGES FOLLOW)**
pg. xi

Central Valley. Under No Action and Mechanical Restoration the TRD would divert approximately ~~900~~ 870 taf annually to the Central Valley (actual diversions may be less due to spills and Safety of Dam criteria). Under Maximum Flow, Flow Evaluation, Percent Inflow, and State Permit the TRD would divert ~~0, 655, 750, and 1130 taf~~ 0, 630, 730, and 1,070 taf, respectively. Maximum Flow, Flow Evaluation, and Percent Inflow would reduce the amount of water delivered to CVP contractors and Delta inflow. Under No Action conditions, groundwater pumping, and associated land subsidence, would increase in some parts of the Central Valley (e.g., Yolo, San Joaquin/Tulare areas due to increased water demand driven by population growth. Maximum Flow would substantially exacerbate these effects. Flow Evaluation and Percent Inflow would result in localized groundwater elevation declines and land subsidence compared to No Action. Impacts would be most substantial in the vicinity of areas dominated by water service contractors who are assumed to increase groundwater pumping in response to reduced CVP deliveries.

Water Quality **(CHANGES FOLLOW)**
pgs. xi and xii

The primary water quality concerns in the DEIS/EIR are Trinity and Sacramento River water temperatures, Trinity River turbidity, and Bay-Delta salinity levels. Criteria regarding Trinity River temperature, turbidity, and sediment are administered by the North Coast Regional Water Quality Control Board and the Hoopa Valley Tribe. The temperature criteria were established to maintain cool water temperatures for the benefit of the fishery. In regards to the Sacramento River, the 1993 biological opinion on CVP operational impacts to the endangered winter run chinook salmon is a significant management criteria. The opinion requires certain temperatures at various points in the Sacramento River for the conservation of the species, and that Shasta Reservoir be operated to maintain at least 1.9 maf of storage on September 30. TRD exports are used in conjunction with Shasta releases to assist in meeting the criteria.

Trinity River Basin. Flow Evaluation meets the state temperature criteria 99 percent or more of the time in all water-year classes except critically dry, where the criteria are met 94 percent of the time. That compliance rate is substantially better than all the other alternatives including No Action. The improvement is in large part, due to shifting TRD diversions from spring to summer, thereby not allowing water to warm in Lewiston Reservoir. Use of Trinity Powerplant bypass operations increases Flow Evaluation compliance with state temperature criteria to 100 percent in all water-year classes, but no improvement was seen with bypasses for Percent Inflow and Maximum Flow. Flow Evaluation meets the Hoopa Valley Tribe's temperature criteria an average of 92 percent of the time, with Maximum Flow showing the best compliance at 96 percent. No Action, State Permit, and Percent Inflow meet tribal temperature criteria an average of 83 percent, 78 percent, and 82 percent of the time, respectively. Short-term exceedance of the state turbidity criteria could occur as a result of the channel rehabilitation projects in Flow Evaluation, Percent Inflow, and Mechanical Restoration. These projects would undergo site-specific environmental review that could include mitigating measures to reduce turbidity. The watershed protection work in Mechanical Restoration would reduce sediment inputs into tributaries, and subsequently, into the Trinity River by 240,000-480,000 yd^3/yr, which is approximately 9-17 percent of the average annual sediment produced in the basin.

Central Valley. Model simulations indicate that increased water demands due to population growth and other factors not related to the alternatives in the DEIS/EIR would increase temperature violations in the Sacramento River from 14 to ~~20~~ 16 percent from 1995 to 2020. Flow Evaluation increased the violation frequency to 20.5 percent, with all other alternatives having less impact, except Maximum Flow, which increased to 22.8 percent. ~~Maximum Flow was the only alternative that substantially increased violations above No Action levels. Similarly, only~~ Maximum Flow was the only alternative that increased Shasta carryover violations. Maximum Flow would result in the largest reduction in Delta inflows, and therefore, the most adverse impacts to Delta water quality conditions. The Flow Evaluation and Percent Inflow alternatives were also identified to have modeled impacts to Delta water quality.

Fishery Resources **(CHANGES FOLLOW)**
pg. xiii

Implementation of the alternatives for purposes of restoring the natural production of anadromous fish in the Trinity River could also effect other fish populations in the river, in the TRD reservoirs, and in the Central Valley and Bay-Delta. Federally listed species that could be indirectly impacted include the endangered Sacramento River winter run chinook~~,~~ and threatened Sacramento River spring run chinook salmon, Delta smelt, and Sacramento splittail~~, and the proposed spring and fall runs of the Central Valley chinook.~~ Species proposed for federal listing that could be indirectly impacted include the fall run of the Central Valley chinook salmon.

Tribal Trust **(CHANGES FOLLOW)**
pg. xiv

The importance of the Trinity and Klamath Rivers to the Hoopa and Yurok Tribes is evident by the location and shape of the reservations. The ~~12-mile-square~~ 144-square-mile Hoopa

Valley Indian Reservation is bisected by the lower portion of the Trinity River and the Yurok Reservation is bisected by the Klamath River from its mouth to the confluence with the Trinity. A wide variety of trust assets, ranging from fish to riparian plants to wildlife, could be affected by the alternatives. Therefore, it was decided to use the healthy alluvial river model as a tool for assessing impacts to tribal assets. The DEIS/EIR focuses on the Hoopa Valley and Yurok Tribes; however, the alternatives could indirectly affect other tribes in the region.

Vegetation, Wildlife, and Wetlands *(NO CHANGE)*

Recreation **(CHANGES FOLLOW)**
pg. xv

Trinity River Basin. All of the alternatives showed some benefits and some adverse impacts to recreation opportunities on the Trinity River, depending on the activity, time of year, and water-year class. Maximum Flow showed substantial improvement in terms of river use and benefits, but adverse impacts at Trinity Reservoir due to the large fluctuations in reservoir levels which makes boat ramps unusable substantially more often than is expected under No Action. Flow Evaluation was the only alternative to show increases in recreation use and benefits at both the river and ~~the~~ reservoir, with reservoir recreation use and benefits changing less than 1 percent. State Permit showed the most adverse impacts on the river by a substantial amount (it essentially ended sport fishing), but it showed the largest increase in reservoir use and benefits, although by a comparatively smaller margin. The Trinity River is designated a federal and state Wild and Scenic River, primarily due to its fishery. Maximum Flow and Flow Evaluation would be substantially better at meeting the purposes of the designation than would the other alternatives.

Land Use **(CHANGES FOLLOW)**
pg. xvi

Trinity River Basin. Scheduled peak releases under No Action would not flood existing residences and structures along the Trinity River; however, uncontrolled operational spills have historically inundated such areas and could occur again in the future. Maximum Flow would cause the most flood damage, followed by Percent Inflow, Flow Evaluation, State Permit, and Mechanical Restoration, in that order. Maximum Flow would make inaccessible 79 properties due to road and bridge flooding. Flooding impacts associated with Percent Inflow would be larger than Flow Evaluation (even though their peak releases are comparable) because the peak releases would likely coincide with high tributary inflows. Impacts under State Permit could be slightly higher than No Action (even though scheduled peak releases are less) due to the increased likelihood of major spill events. No impacts to M&I or agricultural lands are anticipated. ~~Based on the assumption that real estate values along the Trinity River would improve indirectly with increases in fish production, Maximum Flow and Flow Evaluation ranked highest in increasing property values.~~ Based on the assumption that the value of real estate adjacent to the Trinity Reservoir would increase with decreasing range of reservoir surface-water fluctuations, Flow Evaluation ranked first overall in increasing property values, followed by Maximum Flow, Percent Inflow and State Permit (tied), and No Action and Mechanical Restoration (tied).

Power Resources *(NO CHANGE)*
Socioeconomics *(NO CHANGE)*
Cultural Resources *(NO CHANGE)*

Air Quality **(CHANGES FOLLOW)**
pgs. xviii and xix

Trinity River Basin. Flow Evaluation, Percent Inflow, and Mechanical Restoration could all result in some increase to airborne particulate matter (PM) as a result of activities associated with the channel rehabilitation sites (e.g., access road building), acquisition and transportation of spawning gravel, dam improvements (Maximum Flow Alternative only) and other actions involving heavy machinery. Mechanical Restoration impacts would likely be greater since the alternative includes an extensive watershed protection program and perpetual mechanical maintenance of channel rehabilitation sites.

Environmental Justice *(NO CHANGE)*
Other Impacts and Commitments *(SEE SUBSECTIONS)*

Cumulative Impacts **(CHANGES FOLLOW)**
pg. xix

Cumulative impacts are the impacts on the environment which result from the incremental impacts of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or entity undertakes such other actions. The proposed action in the DEIS/EIR may be implemented in an interactive manner with other concurrent projects. In addition, those other projects may affect the impacts of the proposed action. The cumulative impact analysis addressed impacts associated with several related actions including:

- Implementation of CVPIA, including evaluation of the 3406(b)(2) water management for upstream and Delta actions similar to those defined in the November 20, 1997 Administrative Paper released by Reclamation and the Service, as well as the October 5, 1999 Decision on Implementation of Section 3406(b)(2) of the CVPIA
- SWRCB water rights process
- CALFED Bay-Delta Program
- Deregulation of the electric industry in California
- Changes in federal farm support programs
- Changes in demand for agricultural products
- Changes to fisheries management
- Changes in demand/supply for timber products
- Changes in demand for recreational activities in the Trinity River Basin not related to the Trinity River or the mainstem reservoirs
- Changes in Trinity River Basin Consumptive Water Use

pg. xxi

Table ES-3 has been modified to correct CVP deliveries with cumulative impacts under each period. See revised Table ES-3 at the end of this section.

Table ES-4 has been modified to correct an omission and now includes environmental impacts and proposed mitigation for groundwater, water quality, and fishery resources. See revised Table ES-4 at the end of this section.

TABLE ES-1
Summary of Impacts

Issue	Hydrologic Conditions or Other Variable	No Action in Year 2020	Compared to No Action: Maximum Flow	Compared to No Action: Flow Study	Compared to No Action: Percent Inflow	Compared to No Action: Mechanical Restoration	Compared to No Action: State Permit	Preferred Alternative to Existing Conditions
Releases into Trinity River	Critically Dry	340,000 af	+36%	+9%	-51%	0%	-65%	+9%
	Dry	340,000 af	+160%	+33%	-5%	0%	-65%	+33%
	Normal	340,000 af	+250%	+~~87~~ 90%	+30%	0%	-65%	+87%
	Wet	340,000 af	+340%	+110%	+93%	0%	-65%	+110%
	Extremely Wet	340,000 af	+530%	+140%	+190%	0%	-65%	+140%
Trinity River Exports to Central Valley	Dry Periods	540,000 af	-100%	-30%	-2%	0%	+39%	-28%
	Long-term Average	870,000 af	-100%	-28%	-16%	0%	+23%	-28%
Trinity Reservoir Elevation on Sept. 30	Dry Periods	~~2,207'~~ 2,214' msl	+~~64'~~ 57'	+~~18'~~ 11'	+~~25'~~ 18'	No Change	+~~11'~~ 4'	+8'
	Long-term Average	~~2,282'~~ 2,285' msl	~~-9'~~ -12'	+~~2'~~ -1'	+~~4'~~ 1'	No Change	+~~11'~~ 8'	-3'
Shasta Reservoir Elevation on Sept. 30	Dry Periods	933' msl	-65'	-11'	-1'	No Change	+3'	-17'
	Long-term Average	992' msl	-15'	-3'	No Change	No Change	+4'	-6"
Delta Inflow	Dry Periods	11,830,000 af	-2%	-1%	0%	0%	+2%	-1 ~~0~~%
	Long-term Average	22,570,000 af	-4%	-1%	-1%	0%	+1%	-1%
Delta Outflow	Dry Periods	6,320,000 af	-1%	0%	0%	0%	-1%	0%
	Long-term Average	14,710,000 af	-3%	-1%	-1%	0%	+1%	-4%
Exports at Tracy and Banks Pumping Plants in the Delta	Dry Periods	3,670,000 af	-5%	-2%	0%	0%	+6%	-3%
	Long-term Average	5,950,000 af	-6%	-1%	0%	0%	+1%	+6%
CVP Deliveries North of Delta	Dry Periods	2,680,000 af	-6%	-4%	0%	0%	+2%	+8%
	Long-term Average	3,120,000 af	-4%	-1%	0%	0%	+1%	11%
CVP Deliveries South of Delta	Dry Periods	1,580,000 af	-13%	-3%	+1%	0%	+13%	-6%
	Long-term Average	2,570,000 af	-13%	-2%	0%	0%	+2%	-3%

TABLE ES-1
Summary of Impacts

Issue	Hydrologic Conditions or Other Variable	No Action in Year 2020	Compared to No Action: Maximum Flow	Flow Study	Percent Inflow	Mechanical Restoration	State Permit	Preferred Alternative to Existing Conditions
Days with Trinity River Temperature Violations—State standards (percent of the year in violation of Hoopa Valley Tribe temperature standards)	Critically Dry	78% (12%)	29% (0%)	6% (8%)	100% (13%)	78% (12%)	100% (12%)	84% (12%)
	Dry	24% (8%)	29% (2%)	1% (6%)	87% (12%)	24% (8%)	43% (15%)	0% (8%)
	Normal	2% (31%)	28% (6%)	1% (15%)	86% (29%)	2% (31%)	61% (35%)	3% (31%)
	Wet	0% (27%)	28% (6%)	0% (8%)	72% (23%)	0% (27%)	86% (31%)	0% (27%)
	Extremely Wet	0% (0%)	73% (10%)	0% (0%)	53% (6%)	0% (0%)	59% (6%)	0% (0%)
Months Sac. River Temp. Violations	Long-term Average	~~20~~16%	23%	20%	20%	20%	16%	14%
Years Shasta Res. Carryover Violations	Long-term Average	12%	14%	12%	12%	12%	10%	9%
Trinity Escapement as % of TRRP[a] Goals	-	.08	.81	.66	.23	.18	.00	.08
Trinity River Fish Harvested	-	11,300	+909%	+741%	+186%	+117%	-100%	0%
Ocean Sportfishing Benefits (millions)	-	$~~35.2~~ 42.2	+~~16~~ 15%	+~~15~~ 14%	+12%	+~~12~~ 11%	~~-10~~ 11%	40%
Gross Commercial Salmon Revenue (millions)	-	$19.0	+45%	+41%	+28%	+26%	-37%	-
Index of Restoration of Trinity River Tribal Assets	-	.08	.81	.66	.23	.18	.00	.08
Rank of ability to Restore Vegetation to Pre-Dam Conditions	-	5	1 (Best)	2	3	4	6	5
Trinity River Visitor Days	-	317,200	+33%	+22%	-2%	0%	-39%	+79%

TABLE ES-1
Summary of Impacts

Issue	Hydrologic Conditions or Other Variable	No Action in Year 2020	Compared to No Action: Maximum Flow	Compared to No Action: Flow Study	Compared to No Action: Percent Inflow	Compared to No Action: Mechanical Restoration	Compared to No Action: State Permit	Preferred Alternative to Existing Conditions
Lower Klamath River Visitor Days	-	13,200	+28%	+24%	+8%	+5%	-5%	+84%
Trinity Reservoir Visitor Days	-	~~796,200~~ 803,600	~~-4~~ 5%	~~+1~~ 0%	~~+2~~ 1%	0%	~~+6~~ 5%	+66%
Shasta Reservoir Visitor Days	-	5,682,700	-8%	-2%	0%	0%	+2%	+60%
Flooding Impacts to Trinity River (excluding spills)	Properties/Cost (millions)	0/0	112/$14.3	1/$5.0	16/$6.0	0/0	0/0	0/0
CVP M&I Deliveries to Sacramento Valley	Dry Periods	82,000 af	-17.8%	-12.2%	+1.5%	0%	+7.9%	-9%
	Long-term Average	106,000 af	-13.3%	-3.5%	-0.6%	0%	+2.4%	-22%
CVP M&I Deliveries to San Joaquin Valley	Dry Periods	21,000 af	-1.2%	-0.4%	+0.4%	0%	+2.1%	-14%
	Long-term Average	27,000 af	-2.2%	-0.4%	-0.1%	0%	+0.5%	-11%
CVP M&I Deliveries to Bay Area	Dry Periods	231,000 af	-35.6%	-22.4%	+4.7%	0%	+20.7%	+8%
	Long-term Average	279,000 af	-24.8%	-5.1%	-0.3%	0%	+5.1%	-6%
San Joaquin Valley Agriculture (millions)	Dry Periods	$5,168	+0.1%	+0.1%	0.0%	0%	+0.1%	+15.6%
	Long-term Average	$5,195	-0.2%	0.0%	0.0%	0%	+0.0%	+15.6%
Tulare Basin Agriculture (millions)	Dry Periods	$4,513	+0.2%	+0.1%	0.1%	0%	+0.1%	+18.4%
	Long-term Average	$4,557	-0.1%	0.0%	0.0%	0%	+0.0%	+17.8%
San Felipe Unit Agriculture (millions)	Dry Periods	$63	-25.8%	-9.9%	+3.6%	0%	+37.8%	-16.4%
	Long-term Average	$98	-31.1%	-6.0%	-1.6%	0%	+5.2%	-9.8%
CVP Hydropower Energy	Dry Periods	2,946 GWh	-25%	-7%	+1%	0%	+9%	-
	Long-term Average	5,169 GWh	-21%	-6%	-3%	0%	+4%	-
Value of Hydro-power (millions)	Long-term Average		-$26.0	-$5.6	-$7.0	$0	+$5.9	$9,029
Cost per MWh for Ave. Customer	Synthetic Ave. Year		+$0.96	+$0.21	+$0.26	$0	-$0.22	$0.33

TABLE ES-1
Summary of Impacts

Issue	Hydrologic Conditions or Other Variable	No Action in Year 2020	Compared to No Action					Preferred Alternative to Existing Conditions
			Maximum Flow	Flow Study	Percent Inflow	Mechanical Restoration	State Permit	
Implementation Costs 1998-2020 (excluding mitigation and ongoing TRRP[a] projects)	Total Cost 1998-2020 (millions)	$1.5	$30.3-$80.2	$71.8-$115.8	$13.8	$74.3	$1.6	-
	Major Expense	Spawning Gravel	Modify Dams and Spawning Gravel	Channel Rehab. and Adaptive Manage.	Channel Rehab-ilitation	Channel Rehab. and Watershed Protection	Spawning Gravel	-

[A]Trinity River Restoration Program

[B]~~Trinity River Restoration Program~~

[c]Mitigation includes residence and bridge relocation/modification, reservoir boat ramp modification, and other costs. Other TRRP projects include dredging of sediment ponds, operation of Buckhorn Dam, operation of the Trinity River Salmon and Steelhead Hatchery, and other projects.

TABLE ES-3
Cumulative Impact Water Deliveries

Type of Period	Simulated Annual CVP Deliveries[a] (taf)			
	1995 Existing Conditions	No Action in 2020	Preferred Alternative in 2020	With Cumulative Impacts
Long-term Average	5,380	5,690	5,600	~~5,580~~ 5,460
Dry Period	4,020	4,260	4,100	~~3,980~~ 3,870
Wet Period	5,860	6,200	6,180	~~6,380~~ 6,270

[A]CVP deliveries include deliveries to Agricultural and M&I Water Service Contractors, Sacramento River water rights contractors, other water rights contractors, and San Joaquin River Exchange Contractors. CVP deliveries do not include refuge water supplies.

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		Water Resources	
Groundwater			
Maximum Flow Flow Evaluation Percent Inflow	Significant declines in groundwater levels could occur in the Sacramento Valley and Tulare Basin regions, primarily in areas receiving CVP agricultural service contract water.	Although changes to surface water supply *per se* were not considered an impact, the development of additional water supplies to meet demands would lessen the associated impacts (e.g., groundwater impacts). A number of demand- and supply-related programs are currently being studied across California, many of which are being addressed through the ongoing CALFED and CVPIA programs and planning processes. Although none of these actions would be directly implemented as part of the alternatives discussed in this DEIS/EIR, each could assist in offsetting impacts resulting from decreased Trinity River exports. Examples of actions being assessed in the CALFED and CVPIA planning processes include: • Develop and implement additional groundwater and/or surface-water storage. Such programs could include the construction of new surface reservoirs and groundwater storage facilities, as well as expansion of existing facilities. Potential locations include sites throughout the Sacramento and San Joaquin Valley watersheds, as well as the Delta. • Purchase long- and/or short-term water supplies from willing sellers (both in-basin and out-of-basin) through actions including, but not limited to, temporary or permanent land fallowing. • Facilitate willing buyer/willing seller inter- and intra-basin water transfers that derive supplies from activities such as conservation, crop modification, land fallowing, land retirement, groundwater substitution, and reservoir re-operation. • Promote and/or provide incentive for additional water conservation to reduce demand. • Decrease demand through purchasing and/or promoting the temporary fallowing of agricultural lands. • Increase water supplies by promoting additional water recycling.	Significant
Maximum Flow Flow Evaluation Percent Inflow	The groundwater level declines could result in increased land subsidence within limited areas within the San Joaquin Valley and Tulare Basin regions.	See above.	Significant
Maximum Flow	Additional groundwater pumping could	See above.	Significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
Flow Evaluation Percent Inflow	result in upwelling of groundwater high in ~~TSD~~ TDS into productive groundwater zones within limited areas within the San Joaquin Valley and Tulare Basin regions.		
		Water Quality	
Flow Evaluation Mechanical Restoration Percent Inflow	The channel rehabilitation projects would result in short-term Trinity River turbidity impacts.	• A 401 water quality certification would be obtained from the NCRWQCB, and a construction procedure would be developed to meet the Basin Plan turbidity requirements. Monitoring would be conducted as specified by the NCRWQCB, and efforts would be taken to reduce levels if they are 20 percent or more over background (e.g., isolating the work area and/or slowing or halting construction until the 20-percent level is achieved). • Notify individual diverters with state diversion permits within 2 miles downstream of any mechanical channel rehabilitation activity at least 2 days in advance of activities likely to produce turbidity.	Less than significant
Maximum Flow Flow Evaluation Percent Inflow	Violate temperature objectives and carryover storage criteria established in the Sacramento River winter run chinook salmon Biological Opinion.	Significant[a] impacts identified for the increased frequency of temperature and carryover storage violations ~~would need to be~~ were evaluated by ~~the~~ NMFS. ~~Such consultation could result in modification of the existing Biological Opinion. Given the result of this consultation is unknown, this significant impact is considered to be unmitigable at this time.~~ See mitigation for water quality fish-related impacts under Fishery Resources. (See also water supply related impacts under Groundwater.)	Significant[a]
Maximum Flow Percent Inflow State Permit	Violate state temperature objectives established for the Trinity River.	Significant impacts identified for violation of state temperature objectives would be evaluated by the NCRWQCB. Consultation with NMFS would occur pursuant to Trinity River coho salmon. Bypassing the Trinity Powerplant could offset impacts to temperature in the Trinity River. Preliminary analysis of powerplant bypasses indicates that pulling colder water from lower in the reservoir could alleviate temperature impacts. Further evaluation of the benefits and costs would be needed before a full assessment could be made. Given the result of consultations and bypass analysis is unknown, this significant impact is considered to be unmitigable at this time.	Significant
Maximum Flow Percent Inflow State Permit	Violate Hoopa Valley Tribe temperature objectives established for the Trinity River.	Significant impacts identified for violation of tribal temperature objectives would be evaluated by the Hoopa Valley EPA. Consultation with NMFS would occur pursuant to Trinity River coho salmon. Bypassing the Trinity Powerplant could offset impacts to temperature in the Trinity River. Preliminary analysis of powerplant bypasses indicates that pulling colder water from lower in the reservoir could alleviate temperature impacts. Further	Significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		evaluation of the benefits and costs would be needed before a full assessment could be made. Given the result of consultations and bypass analysis is unknown, this significant impact is considered to be unmitigable at this time.	
		Fishery Resources	
Native Anadromous Species			
State Permit	Would affect native anadromous species utilizing the Trinity River due to inadequate habitat conditions and water temperature.	Anticipated significant impacts to native anadromous salmonids in the Trinity River from implementation of this alternative would be unmitigatable.	Significant
Maximum Flow Flow Evaluation Percent Inflow	Violate temperature objectives and carryover storage criteria established in the Sacramento River winter run chinook salmon Biological Opinion.	(See mitigation for water quality related impacts under Water Quality.) ~~Consult with NMFS and implement any required conservation measures. Given the result of this consultation is unknown, this significant impacts is considered to be unmitigable at this time.~~ Significant impacts requiring mitigation for adverse effects to anadromous salmonids in the Sacramento River system associated with Maximum Flow and Percent Inflow Alternatives would need to be addressed during reconsultation with NMFS. Significant impacts related to temperature objectives and carryover storage criteria established in the Sacramento River winter-run chinook salmon BO for the Flow Evaluation (Preferred Alternative) were addressed through reconsultation under ESA with NMFS. Per the NMFS' Biological Opinion (2000; under separate cover), implementation of the Preferred Alternative is not likely to jeopardize Southern Oregon/Northern California Coast (SONCC) coho salmon, Sacramento River winter-run chinook salmon, Central Valley spring-run chinook salmon, or Central Valley steelhead. The NMFS does anticipate that SONCC coho salmon habitat adjacent to and downstream of the channel rehabilitation projects associated with the Preferred Alternative may be temporarily degraded during construction. Construction of these projects, which will create a substantial amount of additional suitable habitat, may temporarily displace an unknown number of juvenile coho salmon but is not expected to result in a lethal take. The NMFS does not anticipate that the implementation of the proposed action will incidentally take Central Valley spring-run chinook or Central Valley steelhead, but that the Preferred Alternative will result in a minute increase in the level of Sacramento River winter-run chinook incidentally taken in all years except critically dry years. In such years, Reclamation would be required to reinitiate consultation per the	Significant[a]

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		existing Winter-run Central Valley Project Operations Criteria and Plan to develop year-specific temperature control plans. Implementation of the following reasonable and prudent measures specified in the NMFS BO to minimize the effects of incidental take shall be non-discretionary and will result in minimizing impacts of incidental take of SONCC coho salmon and Sacramento River winter-run chinook salmon in all years including critically dry years: The Service and Reclamation shall: 1. Implement the flow regimes included in the proposed action (as described in the DEIS/EIR, page 2-19, Table 2-5) as soon as possible. 2. Ensure that NMFS is provided the opportunity to be represented during implementation of the Adaptive Environmental Assessment and Management program. 3. Ensure that the replacement bridges and other infrastructure modifications, needed to fully implement the proposed flow schedule, are designed and completed as soon as possible. 4. Periodically coordinate with NMFS during the advanced development and scheduling of the habitat rehabilitation projects described in the DEIS/EIR. 5. Complete “the first phase of the channel rehabilitation projects” (U.S. Fish and Wildlife Service and U.S. Bureau of Reclamation, 2000) in a timely fashion. 6. Implement emergency consultation procedures during implementation of flood control or “safety of dams” releases from Lewiston Dam to the Trinity River. 7. In dry and critically dry water-year classes, Reclamation and Service shall work cooperatively with the upper Sacramento River Temperature Task Group to develop temperature control plans that provide for compliance with temperature objectives in both the Trinity and Sacramento Rivers. Implementation of these measures will be non-discretionary.	

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
Resident Native and Non-native Fish			
State Permit	Increased water temperatures, which would reduce non-native Trinity River fish habitat.	Anticipated significant impacts to resident fish in the Trinity River from implementation of this alternative would be unmitigatable.	Significant
Maximum Flow Flow Evaluation Percent Inflow	Impacts to Delta smelt and Sacramento splittail as a result of changes in Delta inflow to export ratios.	~~Consult with Service and implement any required conservation measures. Given the result of this consultation is unknown, this significant impact is considered to be unmitigable at this time.~~ Significant impacts requiring mitigation related to changes in Delta inflow and export ratios associated with Maximum Flow and Percent Inflow Alternatives would need to be addressed during reconsultation with NMFS. Significant impacts related to changes in Delta inflow and export ratios for the Flow Evaluation (Preferred Alternative) were addressed through consultation under ESA with the Service. Per the Service's Biological Opinion (2000; under separate cover), implementation of the Preferred Alternative is not likely to jeopardize delta smelt and Sacramento splittail or adversely modify critical habitat for delta smelt. The Service has concurred with the determination that implementing the Preferred Alternative will not likely adversely affect the bald eagle and northern spotted owl. It is anticipated that delta smelt and Sacramento splittail will be adversely affected by implementing the Preferred Alternative and that incidental take may be affected in manner or extent not analyzed in the March 6, 1995 Biological Opinion on the Long-term Operation of the CVP and SWP. Therefore, the following reasonable and prudent measure to minimize the effects of incidental take was developed: 1. U.S. Bureau of Reclamation (Reclamation) shall minimize the effects of reoperating the Central Valley Project resulting from the implementation of the Preferred Alternative within the Trinity River Basin on listed fish in the Delta. Implementation of this measure will be non-discretionary.	Significant[a]
Reservoirs			
Maximum Flow	Impacts to largemouth and smallmouth bass spawning in Trinity Reservoir due to reduced water surface levels.	A smallmouth and largemouth bass stocking program shall be instituted similar to the existing stocking program for coldwater species.	Less than significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
Ocean Fisheries Economics			
State Permit	Reduced angler benefits and net income of charter boat operators in the Mendocino Region.	No mitigation is available.	N/A
State Permit	Reduced commercial fishing harvests and related economic benefits.	No mitigation is available.	N/A
		Tribal Trust	
State Permit	Reduced flows would lead to further decline in tribal access to trust resources.	No mitigation is available.	Significant
		Vegetation, Wildlife, and Wetlands	
Vegetation			
Maximum Flow Flow Evaluation Percent Inflow Mechanical Restoration	Ground disturbing activities could result in a loss of vegetation and special-status plant populations.	Conduct site-specific environmental reviews prior to mechanical ground-disturbing activities. Such reviews shall, when appropriate, include surveys for federal and state endangered, threatened, and proposed species, or for other species if required by permitting agencies (e.g., USFS). If such species are present, actions shall be taken to avoid impacts. Develop and implement a revegetation plan for all ground-disturbing activities (excluding channel rehabilitation sites). Revegetation shall use plant species found adjacent to the impact area or from similar habitats, subject to land-owner and/or agency concurrence. Replacement ratios and monitoring plans, if determined necessary, will be developed in cooperation with the Corps, Service, and CDFG.	Less than significant
State Permit	Further degradation of riparian vegetation due to reduced flows.	No mitigation is available.	Significant
Wildlife			
Flow Evaluation Percent Inflow Mechanical Restoration	Direct mortality of foothill yellow-legged frogs or egg masses, adult western pond turtles and hatchlings, or willow flycatcher nests and young during construction (and maintenance for the Mechanical Restoration) of the channel rehabilitation sites.	Conduct site-specific environmental reviews prior to mechanical ground-disturbing activities. Such reviews shall, when appropriate, include surveys for federal and state endangered, threatened, and proposed species, or for other species if required by permitting agencies (e.g., USFS). If such species are present, actions shall be taken to avoid impacts (e.g., delay construction until after willow flycatcher chicks fledge).	Less than significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
State Permit	Continued degradation and reduction of habitat as a result of reduced flows.	No mitigation is available.	Significant
Wetlands			
Flow Evaluation Percent Inflow Mechanical Restoration	The mechanical channel rehabilitation projects could impact wetland resources.	Conduct pre-construction delineation of wetland areas at sites that may contain wetlands. Consult with the Corps on potential impacts to wetland resources. No mitigation is available.	Less than significant
		Recreation	
Riverine			
Maximum Flow Flow Evaluation Mechanical Restoration State Permit Percent Inflow	Impacts from flows to a number of recreation activities for at least a portion of the recreation season.	Flow-related significant impacts would be unmitigable without changing the flow release schedule which is inherent to the alternative.	Significant
Maximum Flow Flow Evaluation State Permit Percent Inflow	Impacts to public safety from river flows that are too high or too low (i.e., outside the preferred range for boating).	Post signs at river access points showing daily flows. Offer a toll-free telephone number so recreationalists can call to obtain daily flow information. Post daily flows on the Internet.	Less than significant
Maximum Flow Flow Evaluation Percent Inflow Mechanical Restoration	Impacts to recreation activities from turbidity associated with the construction (and maintenance for Mechanical Restoration) of the channel rehabilitation sites.	(See mitigation for water quality related impacts under Water Quality.)	Less than significant
Reservoirs			
Maximum Flow Flow Evaluation	Increase the frequency at which Trinity Reservoir boat ramps are unusable, which would indirectly impact marinas and campgrounds.	All affected boat ramps should be extended a sufficient distance to accommodate the new water levels. Marina owners should be compensated for additional costs associated with moving their facilities or to construct new facilities to accommodate the new water levels. Campground facilities should be modified or funding provided to accommodate the revised operational approach.	Less than significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		Land Use	
Residential/Municipal and Industrial			
Maximum Flow Flow Evaluation Percent Inflow	Increased flooding of Trinity River structures and/or residences.	Property owners could be compensated at fair market value for all flood-related structure/improvement losses incurred, or funding would be provided to retrofit structures/improvements to withstand peak flows. Property owners who have parcels with buildable sites outside of the current 100-year floodplain that would be regularly inundated could be compensated at fair market value for the loss of development rights to that parcel. Given funding for these efforts is not yet been determined, this significant impact is considered to be unmitigable at this time.	Significant
Maximum Flow	Potentially significant M&I related impacts as a result of decreased surface-water supplies.	(See water supply related impacts under Groundwater.)	Significant
Agriculture			
Maximum Flow Flow Evaluation	Substantially decrease irrigated acreage within the San Felipe Unit.	(See water supply related impacts under Groundwater.)	Significant
		Power	
Maximum Flow Flow Evaluation Percent Inflow	Potentially significant power-related impacts from decreased surface-water supplies.	(See water supply related impacts under Groundwater.) Power-related benefits associated with such programs would only occur if operations were conducted to provide increased generation; otherwise, implementation of such programs could negatively affect power resources.) Operating criteria would be established to allow Western to respond to various emergency situations in accordance with their obligations to the North American Electric Reliability Council. This commitment would also provide for exemptions to a given alternative's operating criteria during search and rescue situations, special studies and monitoring, dam and powerplant maintenance, and spinning reserves. Such exemptions for responding to various emergency situations would be consistent with the Presidential Memorandum, dated August 3, 2000, directing federal agencies to work with the State of California to develop procedures governing the use of backup power generation in power shortage emergencies.	Significant

TABLE ES-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		Cultural Resources	
Maximum Flow Flow Evaluation Percent Inflow Mechanical Restoration	Impacts to cultural resources.	Conduct cultural resource surveys of project areas (including areas of ancillary activities, such as staging areas, gravel mining areas, etc.) prior to ground disturbance. Areas containing cultural resources shall be demarcated and activities planned to avoid these areas. If cultural resources cannot be avoided, additional research or test excavations (as appropriate) will be undertaken to determine whether the resources meet CEQA and/or NRHP significance criteria. Unavoidable impacts on significant resources would be mitigated for in a manner that is deemed appropriate. Mitigation for significant resources may include, but is not limited to, data recovery, public interpretation, performance of a Historic American Building Survey or Historic American Engineering Record, or preservation by other means.	Less than significant
		Air Quality	
Maximum Flow Flow Evaluation Percent Inflow Mechanical Restoration	Spawning gravel placement and other heavy equipment work associated with the alternatives would result in potentially significant PM_{10} impacts as a result of fugitive dust.	Implement a dust control program, which includes: watering of stockpiles, roads, etc. as necessary, and identify an individual to monitor dust control and to respond to citizen complaints.	Less than significant

[a]These impacts were identified as “significant” per the CEQA-related significance threshold standards described in Chapter 3.

2.2 Changes to the DEIS/EIR

1.0 Introduction and Purpose and Need *(SEE SUBSECTIONS)*
1.1 Introduction *(NO CHANGE)*
1.2 Purpose and Need for the Action *(SEE SUBSECTIONS)*
1.2.1 Purpose and Need Statement *(NO CHANGE)*

1.2.2 Goals and Objectives **(CHANGES FOLLOW)**
pg. 1-5

The following are project objectives for CEQA compliance that apply to state ***responsible*** and ***trustee agencies*** such as the North Coast Regional Water Quality Control Board (NCRWQCB), the State Lands Commission (SLC), the California Department of Fish and Game (CDFG) and (possibly) the State Water Resources Control Board (SWRCB):~~a~~

- Comply with the Water Code to ensure the highest reasonable quality of waters of the state, while allocating those waters to achieve the optimum balance of beneficial uses.
- Protect the public trust assets of the Trinity River watershed.
- Conserve, restore, and manage fish, wildlife, and native plant resources.
- Double populations of naturally produced salmon, steelhead, and anadromous fish in the waters of California, including the Trinity and Sacramento Rivers and the Delta, pursuant to the Fish and Game Code Section 6900-6924, the Salmon, Steelhead Trout, and Anadromous Fisheries Program Act.

Trinity River Restoration Program Goals.
pg. 1-7

In the future, quantitative population objectives for Trinity River salmonids may be established by the National Marine Fisheries Service (NMFS) as part of the recovery planning process under the Endangered Species Act (ESA). Currently, Trinity River naturally produced coho salmon are listed as threatened, and both the chinook and steelhead are candidates for listing.

1.3 General Setting and Location *(NO CHANGE)*
1.4 Legislative and Management History *(NO CHANGE)*
1.5 Indian Tribes *(NO CHANGE)*
1.6 Project Facilities *(SEE SUBSECTIONS)*
1.6.1 Trinity River Division *(NO CHANGE)*

1.6.2 Central Valley Project **(CHANGES FOLLOW)**
pg. 1-19

The CVP provides water for irrigation, municipal and industrial (M&I), hydropower, and fish and wildlife purposes in and outside of the Central Valley of California. The CVP supplies ***irrigation water*** to approximately 200 water districts, individuals, and companies pursuant to annual ~~contracts~~ demand for approximately 4.5 million acre-feet (maf) of ~~developed contract~~ water. These supplies are provided to entities with pre-1914 water rights, as well as through contracts to water service, water rights settlement, and exchange water contract

holders. M&I water is supplied to about 40 districts and utilities under contracts of about 0.5 maf. Except in times of water shortage, Reclamation operates the CVP to deliver the amounts of water specified in its water service contracts and other water rights agreements. Major structures of the CVP include 20 reservoirs, with combined storage capacity of 11 maf; 9 powerplants and 2 pumping-generating plants with a maximum capacity of about 2.0 million kW; and approximately 500 miles of major canals and aqueducts (see Figure 3-11 for a graphic depicting the major facilities in the CVP).

1.6.3 State Water Project *(NO CHANGE)*

1.7 Similarities and Differences between NEPA and CEQA (CHANGES FOLLOW) pg. 1-20

CEQA requires that this DEIS/EIR propose mitigation measures for each significant effect of the project subject to the approval of an agency governed by California law, even where the mitigation measure cannot be adopted by the "lead agency" (Trinity County for this project), but can only be imposed by another responsible agency. At present, it is unclear whether the SWRCB will function as a responsible agency. As the CEQA lead agency, however, Trinity County has decided that the EIR portion of the EIS/EIR must be sufficient for any future action taken by SWRCB, should it get involved in some fashion. For this reason, the DEIS/EIR must contemplate action by the SWRCB. Many of the proposed mitigation measures could ultimately ~~by~~ be within the jurisdiction of the SWRCB.

1.8 Scoping and Public Involvement (CHANGES FOLLOW) pg. 1-22

The Service began the public process by preparing an NOI to prepare an EIS, which was published in the Federal Register on October 12, 1994. Trinity County forwarded a Notice of Preparation (NOP) of an EIR to the State Clearinghouse (No. 94123009) on November 15, 1994. The new State Clearinghouse number is 1994123009.

1.9 Other Related Environmental Processes *(NO CHANGE)*
1.10 Preparers of the DEIS/EIR *(NO CHANGE)*
1.11 Areas of Controversy *(NO CHANGE)*

2.0 Description of Alternatives *(SEE SUBSECTIONS)*
2.1 Alternatives *(SEE SUBSECTIONS)*

2.1.1 Selection of the Preferred Alternative (CHANGES FOLLOW) pg. 2-3

The Flow Evaluation Alternative, coupled with additional watershed protection efforts (described in the Mechanical Restoration Alternative), was identified as the Preferred Alternative in terms of best meeting the purpose and need and goals and objectives, while also minimizing adverse impacts. The selection of the Preferred Alternative also utilized the following screening criteria, which were jointly developed by the four co-leads (Service, Reclamation, Hoopa Valley Tribe, and Trinity County). The Preferred Alternative:

- Substantially increases natural production of anadromous fish on the Trinity River mainstem
- Substantially restores inriver and ocean fishing opportunities

- Improves tribal access to trust resources
- Balances environmental and social beneficial and adverse impacts across the Trinity River Basin, Lower Klamath River Basin/Coastal Area, and Central Valley Basin while meeting the mandate from the SWRCB in Water Rights Orders 90-05 and 90-01 to cause no harm to the Trinity River fishery as a result of diversions to the Sacramento River for temperature control
- Allows for the continued operation of the TRD, including water exports
- Limits flooding impacts on the Trinity River

pg. 2-4

The following text has been added immediately above 2.1.2 No Action Alternative:

The 600 thousand acre-feet (taf) carryover storage level associated with the Flow Evaluation Alternative would be maintained for the Preferred Alternative except in exceedingly dry years if deemed necessary to avoid potentially infeasible operations at Shasta Dam. In such years (identified as potentially occurring in the future per the modeling analysis under the cumulative scenario), carryover storage would be reduced to 400 taf.

2.1.2 No Action Alternative (CHANGES FOLLOW)

The No Action Alternative represents ongoing activities and operations and is intended to meet the state CEQA Guidelines, §15126, as "a condition that would be reasonably expected to occur if the project were not approved." Components of this alternative are approved programs that have obtained all environmental clearances and permits. The No Action Alternative reflects conditions in the year 2020 and includes projections concerning future growth and land use changes per the DWR Water Plan Update (Bulletin 160-93). The year 2020 was identified as the planning horizon because of the inter-relationship with the DWR Bulletin 160-93, data from the Trinity County General Plan, and the Central Valley DPEIS. The No Action Alternative includes assumptions concerning concurrent but separate issues, such as the assumption that ocean harvest limitations for sport and commercial salmon fishing would be consistent with ~~1992~~ policies that have been in place since 1992 and would be evaluated in a separate process by NMFS and other groups. The No Action Alternative does not assume implementation of any of the provisions or programs of the CVPIA, and is therefore identical to the No Action Alternative in the CVPIA Programmatic Environmental Impact Statement (PEIS) process.

pgs. 2-5 and 2-6

Table 2-2 has been modified. The reference to the CVPIA under Trinity River has been deleted. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Table 2-2.

Water Operations.
pg. 2-7

The following text has been added immediately above Watershed Protection:

Subsequent to the modeling analyses conducted for the Draft EIS/EIR, the California Court of Appeal for the Third Appellate Court struck down a portion of the Monterey Agreement signed by the Department of Water Resources and State Water Project (SWP) contractors in 1994. The agreement amendments changed the prior method of allocating water supply deficiencies, which reduced supplies to agricultural contractors before those to urban contractors were cut. The No Action and all other Trinity alternatives assume the Monterey Agreement is in place, and SWP supplies are allocated among agricultural and municipal and industrial (M&I) contractors evenly in proportion to their entitlement. The Monterey Agreement, as simulated in the No Action Alternative, has no effect on the level of SWP delivery, rather it only affects the delivery allocation to contractors south of the Delta once an overall delivery level has been determined. Therefore, the Monterey Agreement does not have any impact on the amount of water the SWP exports from the Delta. The amount of water exported is a function of demand, available supply, and export restrictions.

Accordingly, it is not anticipated that this court decision will have any significant impact on the results of the modeling analyses conducted for the Draft EIS/EIR.

pgs. 2-8 and 2-11

Fish Population Management. Fishing would continue under current harvest plans approved by the Klamath Fishery Management Council (KFMC), ~~and the~~ PFMC, Hoopa Valley Tribe, Yurok Tribe, and California Fish and Game Commission. Fisheries that do not have comprehensive management plans would continue to be managed by the responsible agencies or tribes. The TRSSH would continue to produce fish at current levels, as shown in Table 2-3.

2.1.3 Maximum Flow Alternative (CHANGES FOLLOW)
pg. 2-12

Table 2-4 has been modified to correct a unit error. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Table 2-4.

2.1.4 Flow Evaluation (CHANGES FOLLOW)
pgs. 2-16 and 2-17

~~As described in the TRFES, t~~The ~~a~~Adaptive Environmental Assessment and ~~m~~Management (AEAM) program would be administered by an executive director hired by the Trinity Management Council, the decision-making group within the AEAM program ~~appointed by the Secretary~~. ~~The director would oversee a Trinity management council composed of fishery agency representatives.~~ The ~~c~~Council would serve as a policy group that reviews, modifies, accepts, or remands recommendations made by a technical modeling and analysis team. Also included in the process would be a scientific advisory board, a stakeholder~~'s~~ group, a regulatory agency group, a contracting and environmental compliance group, an ~~and~~ external peer review~~ers.~~ group, and a liaison to the Secretary of the Interior. The AEAM ~~adaptive management~~ program would typically convene ~~in the winter~~ several times during the year to make decisions concerning the coming year's dam releases, budgeting

activities, and other management actions. A detailed description of the adaptive management program was given in the Trinity River Flow Evaluation Study, pages 278 through 289. Appendix F of the Trinity River Mainstem Fishery Restoration FEIS/EIR further refines the structure of the AEAM program. ~~(for a complete description of the adaptive management program see U.S. Fish and Wildlife Service and Hoopa Valley Tribe, 1999).~~

The adaptive management program could result in minor modifications to the Flow Evaluation hydrographs described in this DEIS/EIR. ~~Any m~~Modifications to the proposed restoration activities (flow schedules and channel rehabilitation projects) resulting from the AEAM ~~adaptive management~~ program ~~would~~ could be subject to additional NEPA and CEQA analysis as required by law. All mechanical ground-disturbing actions originating from the adaptive management program, regardless of whether they are described in this document, would be subject to site-specific environmental review.

pg. 2-17

Table 2-5 has been modified to correct a unit error and number of acre-feet under the normal water-year class. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Table 2-5.

Water Management.
pg. 2-18

Fluvial geomorphic/salmonid smolt temperature control flows (late April/mid-May through June 30)—These were developed to provide fluvial geomorphic processes and suitable temperature and flow conditions for outmigrating salmonid smolts. Peak flows of 11,000 cfs would be released for 5 days beginning May 24 during extremely wet water years to assist in geomorphic processes such as mobilizing sediment, scouring the riverbed, reshaping the channel, and removing encroaching vegetation. These higher magnitude flows are geomorphically more efficient (more sediment transport per unit of water, greater depth of scour, etc.) than lower flows, and the magnitude of 11,000-cfs flows was found to cause scour depths on exposed point bars sufficient to scour away 2- to 3-year-old willow seedlings, which is a critical process to prevent future riparian encroachment and habitat simplification. The peak levels would vary for each water-year class, down to a minimum of 1,500 cfs in critically dry years. During such years, these flows would not be sufficient to recontour the channel, but would help prevent the germination of unwanted vegetation.

pg. 2-21

Fish Habitat Management. Forty-seven mechanical rehabilitation projects would be constructed because the flow schedule associated with this alternative is too low to remove the existing riparian berms along the river. Figure 2-4 shows the location of each proposed rehabilitation site as well as existing sites. Once portions of the berms are mechanically removed, high flows and gravel transport would naturally create and maintain dynamic alluvial features and floodplain riparian communities. Consequently, no mechanical maintenance would be planned for the proposed or existing channel rehabilitation projects.

The proposed mechanical rehabilitation projects would involve the following:

- A total of 47 mechanical rehabilitation projects would be constructed between the Lewiston Dam and the confluence with the North Fork Trinity River. The sites would encompass approximately 665 acres. Construction would be scheduled between July 15 and September 15 to minimize impacts to fall chinook, coho, and steelhead.
- Of these 47 mechanical rehabilitation projects, 44 would be channel rehabilitation projects, and the remaining three would be side-channel projects. Twenty-four of the channel projects would be built in the first 3 years, with the remainder to be completed contingent upon an evaluation by the adaptive management program. A typical mainstem rehabilitation project would be approximately 150 feet wide (measured from the water's edge) and 500-5,000 feet long. A typical side-channel improvement would be 80 feet wide and 800 feet long.
- A typical project would take 6 weeks to construct and would require the use of front-end loaders, bulldozers, screens, and trucks.
- Each bank rehabilitation project will remove the confining riparian berms, remove the large volumes of sand stored within the berms from frequently flooded areas, reconstruct functional floodplains that are frequently inundated by the proposed high flow regime, and revegetate portions of the newly constructed floodplains with native woody riparian vegetation that increases overall riparian structure, cover, and diversity within the Trinity River corridor.
- Several bank rehabilitation projects may include reclaiming historic gravel mining pits and gold dredger tailings into off-channel riparian and aquatic wetlands.

Figure 2-4 has been revised to more clearly indicate the location of potential side channels. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Figure 2-4.

2.1.5 Percent Inflow Alternative (CHANGES FOLLOW)
pg. 2-25

Table 2-6 has been modified to correct a unit error. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Table 2-6.

2.1.6	**Mechanical Restoration Alternative**	*(NO CHANGE)*
2.1.7	**State Permit Alternative**	*(NO CHANGE)*
2.2	**Alternatives Considered but Eliminated**	*(SEE SUBSECTIONS)*
2.2.1	**Remove Trinity and Lewiston Dams**	*(NO CHANGE)*
2.2.2	**Harvest Management**	*(NO CHANGE)*
2.2.3	**Fish Passage Facilities**	*(NO CHANGE)*
2.2.4	**Truck Fish around the Dams**	*(NO CHANGE)*
2.2.5	**Predator Control**	*(NO CHANGE)*
2.2.6	**Increase Hatchery Production**	*(NO CHANGE)*
2.2.7	**Pumped Storage Project**	*(NO CHANGE)*
2.2.8	**Channel Augmentation Using Weaver Creek**	*(NO CHANGE)*

pg. 2-45

A note has been added to Figure 2-8 to more clearly explain the figure's content. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Figure 2-8.

pg. 2-47

Table 2-9 has been modified to correct the number of acre-feet under the normal water-year class. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Table 2-9.

3.0 Affected Environment and Environmental Consequences *(SEE SUBSECTIONS)*
3.1 Introduction *(SEE SUBSECTIONS)*

3.1.1 Trinity River Basin (CHANGES FOLLOW)
pg. 3-6

The Hoopa Valley Indian Reservation is located north of Willow Creek along the Trinity River and State Highway 96. The reservation is approximately ~~14~~ 144 square miles, with the northern border lying near Weitchpec at the confluence with the Klamath River.

3.1.2 Lower Klamath River Basin/Coastal Area *(NO CHANGE)*
3.1.3 Central Valley *(NO CHANGE)*
3.2 Geomorphic Environment *(SEE SUBSECTIONS)*

3.2.1 Channel Geomorphology and Fluvial Processes (CHANGES FOLLOW)
pg. 3-17

A note has been added to Figure 3-5 to compare Figure 3-5 to Figure 3-7. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Figure 3-5.

pg. 3-23

A note has been added to Figure 3-7 to compare Figure 3-7 to Figure 3-5. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Figure 3-7.

3.2.2 Attributes of a Healthy Alluvial River (CHANGES FOLLOW)
pg. 31

Figure 3-8 has been revised to more accurately identify alluvial river characteristics. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Figure 3-8.

3.3 Water Resources *(SEE SUBSECTIONS)*

3.3.1 Surface-water Hydrology and Management (CHANGES FOLLOW)

Environmental Consequences.

Methodology.
pg. 3-62

The No Action Alternative is used as the baseline for comparison of alternatives. No Action and the other alternatives reflect future conditions at the year 2020 level of development. These future conditions are based on projections concerning future growth, land use changes, and changes in CVP operational policies that are being considered and are under-

going separate environmental documentation. The hydrology and demands included in these simulations reflect DWR Bulletin 160-93. At the year 2020 level of development, ~~annual~~ CVP contracts are assumed to total 6.5 maf per year (with annual demands ranging from 6.2-6.5 maf), and ~~annual~~ SWP entitlements assumed to total 4.2 maf per year (with annual demands ranging from 3.4-4.2 maf). The greatest increases in CVP demands are assumed to occur north of the Delta in association with M&I water rights and water service contracts with the CVP's American River Division (approximately a 320,000 af increase in annual demand).

The following text has been added immediately following the third paragraph on page 3-62:

Subsequent to the modeling analyses conducted for the Draft EIS/EIR, the California Court of Appeal for the Third Appellate District struck down a portion of the Monterey Agreement signed by the Department of Water Resources and SWP contractors in 1994. The agreement amendments changed the prior method of allocating water supply deficiencies, which reduced supplies to agricultural contractors before those to urban contractors were cut. The No Action and all other Trinity alternatives assume the Monterey Agreement is in place, and SWP supplies are allocated among agricultural and M&I contractors evenly in proportion to their entitlement. The Monterey Agreement, as simulated in the No Action Alternative, has no effect on the level of SWP delivery, rather it only affects the delivery allocation to contractors south of the Delta once an overall delivery level has been determined. Therefore, the Monterey Agreement does not have any impact on the amount of water the SWP exports from the Delta. The amount of water exported is a function of demand, available supply, and export restrictions.

Accordingly, it is not anticipated that this court decision will have any significant impact on the results of the modeling analyses conducted for the Draft EIS/EIR.

pg. 3-63

~~There are no major water management issues downstream of the confluence of the Klamath and Trinity Rivers.~~ As noted previously, the influence of tributaries downstream of the North Fork reduces the effects of changes in Lewiston releases. Accordingly, impacts to the Lower Klamath River Basin/Coastal Area are not discussed. Impacts related to flooding are addressed in Residential/Municipal and Industrial (Section 3.9.1).

pg. 3-64

Table 3-3 has been modified to more accurately represent Trinity Reservoir elevations. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Table 3-3.

pg. 3-79

The DEIS/EIR header incorrectly labeled pages 3-79 through 3-124 as "3.4 Water Resources." This numbering problem has been corrected. The header on pages 3-79 through 3-124 now reads: "3.3 Water Resources."

Flow Evaluation.

pg. 3-80

Shasta Reservoir storage would be only slightly impacted due to reduced TRD exports in the long-term average, while dry period effects would be more substantial. In this alternative, long-term average end-of-water-year storage is only slightly less than the No Action Alternative (60,000 af decrease, or 2 percent), while dry-period levels drop 130,000 af (8 percent). The Biological Opinion end-of-water year minimum storage criterion of 1.9 maf is met with the same frequency as under No Action (12 percent for both alternatives). ~~However, during the dry period, minimum storage levels drop approximately 350,000 af below the No Action level.~~

Long-term average annual CVP deliveries decrease by 90,000 af (2 percent). Reductions during the dry period average 160,000 af (4 percent). Annual Delta exports through the Tracy Pumping Plant are reduced by 60,000 af (2 percent) over the entire long-term period and 90,000 af (~~4~~ 5percent) during the dry period. Annual Delta inflow would decrease by 220,000 af (1 percent) over the long-term period and 90,000 af (1 percent) during the dry period. Average annual Delta outflow would decrease by 150,000 af (1 percent) over the long-term period, but would be similar to no Action for the dry period.

pg. 3-81

State Permit. Compared to the No Action Alternative, this alternative would increase long-term average annual exports to the Central Valley by ~~200,000~~ 210,000 af (23 percent) and dry-period exports by 210,000 af (~~41~~ 39 percent). Under this alternative, the prescribed minimum storage in Trinity Reservoir would be the same as the No Action Alternative (400,000 af). Average end-of-water-year storage in Trinity Reservoir would increase during the dry period by 40,000 af (~~4~~ 5 percent) and over the long-term by 80,000 af (6 percent).

pg. 3-82

Existing Conditions versus Preferred Alternative. A large portion of the change in water impacts between 1995 existing conditions and the year 2020 under the Preferred Alternative is attributed to growth and development. In other words, existing conditions assumes a 1995 level of social and economic development, whereas the Preferred Alternative assumes a 2020 level of development (as do the other alternatives). For example, between 1995 and 2020, annual M&I water service contracts and water rights demands are assumed to increase 320,000 af north of the Delta, due primarily to increased M&I demand in the CVP American River Division (major contractors within this division include the City of Sacramento and Placer County). Similarly, agricultural water service contracts and water rights demands north of the Delta are expected to increase 40,000 af over the long-term average. (CVP ~~demands~~ contract amounts south of the Delta in the year 2020 are anticipated to remain comparable to 1995 levels.)

pg. 3-83

Shasta Reservoir end-of-water-year storage would be less than existing conditions by 100,000 af (4 percent). This reduction is attributable to decreased TRD exports as well as increased demand levels in 2020. The Biological Opinion storage threshold of 1.9 maf would be met less frequently than in existing conditions (12 percent of years compared

to ~~10~~ 9 percent). The reduced frequency of meeting the threshold is attributable to non-project changes between 1995 and 2020. During the dry period, minimum storage levels under the Preferred Alternative drop more than 500,000 af below existing condition levels.

3.3.2 Groundwater (CHANGES FOLLOW)

Affected Environment.
pg. 3-85

The following new text has been added to Affected Environment as the third paragraph on page 3-85 immediately following Lower Klamath River Basin/Coastal Area:

Santa Clara and San Benito Counties. Imported surface water from the CVP San Felipe Unit is provided to areas in Santa Clara and San Benito Counties. Water conveyed to these areas is intended to supplement available supplies, minimize groundwater mining, stabilize groundwater level, arrest land subsidence, and improve water quality conditions.

Three interconnected groundwater basins are located within the Santa Clara County area: Santa Clara Valley Basin, Coyote Basin, and Llagas Basin (U.S. Bureau of Reclamation, 1976b). Extensive groundwater pumping for agricultural purposes produces overdraft conditions in these groundwater basins, and resulted in land subsidence, increased pumping costs, and seawater intrusion from the San Francisco Bay. To reverse these conditions, surface water was initially imported to the area in the 1960s through the SWP South Bay Aqueduct. Continued growth during the late 1960s and 1970s threatened to return the area to overdraft conditions. These concerns were dampened by additional surface-water imports to the area from the San Felipe Unit of the CVP in the 1980s. Much of this imported water is distributed to percolation ponds for groundwater recharge, and the remainder is further distributed for direct use and storage.

Groundwater resources in the San Benito County (Hollister area) consist of numerous subbasins partially separated by barriers, generally fault zones, that criss-cross the area. Irrigation of agricultural lands in this area has relied on groundwater as the primary supply. As historical agricultural development expanded, groundwater withdrawals began to exceed groundwater recharge, causing severe declines in groundwater levels. In the 1980s, surface water was imported to this area from the San Felipe Unit of the CVP for the purposes of alleviating the degenerating groundwater conditions. Because of the complex geological fault system, direct groundwater recharge is limited, and imported water is distributed primarily for direct use and storage.

Central Valley.

~~Prior to development of the CVP, g~~***Groundwater overdraft*** conditions have occurred in portions of the San Joaquin Valley and Tulare Basin as a result of extensive groundwater development and the reliance on groundwater during drought years. In some areas, regional groundwater elevations declined by more than 300 feet during the 1940s and 1950s. The development of surface-water supplies in the 1950s and 1960s reduced reliance on groundwater, thus lessening overdraft conditions, and helped control the rapid rate of groundwater-level decline. However, the long-term effects of continued groundwater use have resulted in regional land subsidence. The largest example of human-induced land subsidence in the world occurs in the San Joaquin Valley. Approximately 5,200 square miles

have experienced land subsidence of more than 1 foot. The maximum subsidence of 29.6 feet, recorded between 1925 and 1977, is within western Fresno County (U.S. Geological Survey, 1991). The geographic extent of land subsidence generally coincides with areas where groundwater elevations have declined significantly as a result of historical overdraft conditions (Figure 3-21).

Sacramento Valley.
pg. 3-86

Surface-water and groundwater resources in this region are interdependent. A majority of streambeds in the Sacramento Valley are hydraulically connected with the underlying aquifer. Many streams in this region have historically been gaining streams, a condition where groundwater is discharged into the stream. ~~Only when the aquifer water level falls below the elevation of the streambed would the system be considered hydraulically disconnected.~~ When aquifer water levels fall below the elevation of the streambed, the stream changes from a gaining to a losing stream. Some stream reaches south of the Sutter Buttes have changed to losing streams as groundwater levels have declined due to groundwater pumping.

San Joaquin Valley.
pg. 3-89

The Corcoran Clay Member that divides the groundwater system into two major aquifers underlies much of the western portion of this region. ~~Aquifer recharge to the semi-confined upper aquifer historically occurs from stream seepage, deep ***percolation*** of rainfall, and subsurface inflow along the basin boundary.~~ Post-development aquifer recharge to the semi-confined upper aquifer historically occurs mostly from deep ***percolation*** of irrigation water, but also from deep percolation of rainfall, stream seepage, and subsurface inflow along the basin boundaries. The lower confined aquifer is recharged from subsurface inflow coming from the east boundary of the Corcoran Clay Member. Annual groundwater pumping in the San Joaquin Valley exceeds recent estimates of perennial yield by 200,000 af. Prior to the mid 1950s, ~~the interaction of groundwater and surface water in the San Joaquin Valley resulted in net gains to the streams. Under more recent conditions however, a net loss from streams to the groundwater system has become the predominant condition, a result of groundwater declines from increased pumping~~ the southern portion of the San Joaquin Valley in Madera County experienced net losses from streams, while the northern portion of the San Joaquin Valley generally experienced gains from streams. This situation has not changed. Currently, portions of the San Joaquin Valley continue to experience net gains from streams, while the Madera County portions of the Valley experience losses from streams. Depth to groundwater is approximately 50-100 feet.

Tulare Basin.
pg. 3-90

A significant limitation on groundwater use in municipalities within the Tulare Basin has been caused by the presence of toxins such as dibromochloropropane (DBCP) and ethylene dibromide (EDB) which exceed drinking water standards. DBCP levels resulting from historical agricultural use exceed the maximum standard in large areas of eastern Fresno County and Tulare County and limit groundwater use in Fresno and other urban areas. EDB contamination, also resulting from historical agricultural use, limits groundwater use

in many areas of Kern County. In addition to DBCP and EDB, several other toxic compounds limit the use of water for municipal purposes in parts of the Tulare Basin.

Environmental Consequences.
pgs. 3-90 and 3-93

Methodology. ~~The groundwater analysis assumed groundwater pumping would increase to replace reductions in CVP or SWP deliveries.~~ The groundwater analysis assumes groundwater pumping would increase to replace reductions in CVP or SWP deliveries, with no change in land use or water application rate. It therefore estimates the largest impact on groundwater pumping for a given change in surface-water delivery and provides a very conservative, worst-case result. The agricultural analysis, described in Section 3.9.2, estimates the least costly combination of groundwater pumping, land fallowing, crop changes, and irrigation efficiency changes. Groundwater conditions were simulated using the Central Valley Groundwater-Surface Water Simulation Model (CVGSM), a monthly planning model developed by Reclamation, DWR, and the SWRCB for the Central Valley regional aquifer system. The CVGSM delineates the Central Valley into 21 subregions and hydrologic and water service boundaries (see Figure 3-22). The CVGSM model is a monthly groundwater planning tool that can be used to evaluate the groundwater conditions of the Central Valley regional aquifer under different management scenarios. For the Trinity hydrologic modeling efforts (includes surface-water and groundwater modeling) a static land use approach was taken. For static model runs the projected land use conditions are fixed over time. Two projected land use conditions were used as the basis for these static conditions: (1) a 1995 projected level and (2) a 2020 projected level. These projected-level conditions are the driving force behind the development of much of the projected-level data and assumptions required for the use of CVGSM for Trinity hydrologic modeling.

pg. 3-94

The following text has been added to Methodology on page 3-94 as a new paragraph immediately before Significance Criteria:

Groundwater resources in Santa Clara and San Benito Counties are managed through local groundwater regulations to minimize groundwater overdraft, land subsidence, and groundwater quality degradation. This groundwater management task is facilitated by CVP project water imports via the San Felipe Unit. It is assumed that these management practices will remain in place and that groundwater regulations will limit the potential for groundwater pumping. Because of these actions, no significant impacts to groundwater resources are anticipated and, therefore, are not analyzed under environmental consequences. However, possible reductions in CVP deliveries to the San Felipe Unit are projected to result in other impacts related to land use. These potential impacts are discussed elsewhere in the document (see Sections 3.9 Land Use, 3.11 Socioeconomics, and 4.1 Cumulative Impacts).

San Joaquin Valley and Tulare Basin.
pg. 3-96

Historically, groundwater supplies have been augmented with surface water imported through the San Luis Canal and Friant-Kern Canal. Although this would continue under the No Action Alternative, pumping would still occur at a rate in excess of groundwater replenishment. It is assumed that additional land subsidence, ranging from 1-5 feet over a

69-year simulation period, would occur in areas along the west side of the San Joaquin Valley as a result of continued increases in groundwater extractions required to compensate for ~~possible~~ modeled reductions in SWP and CVP supplies.

pg. 3-109

Existing Conditions versus Preferred Alternative. The comparison of the Preferred Alternative (i.e., Flow Evaluation) to 1995 existing conditions to without-project conditions in 2020 (i.e., No Action) indicates that most impacts to groundwater elevations between 1995 and 2020 would be attributed to growth and development ~~changes unrelated to the project~~. For example, the largest declines in groundwater elevations are seen in the urban areas of Sacramento and Fresno~~, the result of population growth~~ (Figure 3-31). There would be some reduction in surface-water supply attributed to the Preferred Alternative (see pages 3-82 through 3-84 for additional discussion). These reductions occur in CVP service areas along the west sides of the Tulare Basin, resulting in impacts to groundwater levels. These impacts are discussed further below. ~~Impacts as a result of the Preferred Alternative are not as great (Figure 3-26).~~

3.4 Water Quality (CHANGES FOLLOW)

Affected Environment.

Trinity River Basin.
pg. 3-126

The following text has been added immediately above Lower Klamath River Basin/Coastal Area:

On May 17, 1996, the EPA granted program authorization to the Hoopa Valley Tribe with respect to Section 303 of the CWA. Since that time, the Hoopa Valley Tribe has pursued development of a Water Quality Control Plan (Hoopa Valley WQCP) through the Hoopa EPA. An important component of the Hoopa Valley WQCP is water temperature criteria for waters within the Reservation, which includes part of the mainstem Trinity River, as well as several tributaries to the river. The temperature criteria presented in Table 3-5A were adopted by the Hoopa Valley Tribal Council (HVTC) on June 8, 2000; but at the time this document was prepared, the criteria remain to be approved by EPA. Water temperature in this Hoopa Valley WQCP is measured near the confluence of the Trinity River at Weitchpec.

See Section 2.3 Changes to the DEIS/EIR Tables and Figures for new Table 3-5A.

Environmental Consequences.
pg. 3-135

For each alternative, simulations of the RTM and BETTER models were performed for five specific years (1983, 1986, 1989, 1990, and 1977) representing five different water-year classes (extremely wet, wet, normal, dry, and critically dry). ~~Lewiston Dam release temperatures predicted from the BETTER model were subsequently modeled in the SNTEMP model under projected cold-wet, median, and hot-dry hydrometeorological conditions. Model results identified the percentage of time that NCRWQCB temperature objectives would be met. Table 3-7 presents the combinations of flows and temperatures necessary to meet temperature objectives under median weather conditions. Table 3-8 presents the modeling~~

~~results for each alternative under median conditions. Cold-wet and hot-dry conditions are presented in the Water Resources/Water Quality Technical Appendix A.~~ The water temperature standards developed for the Hoopa Valley WQCP were designed to conform with the flow regime specified by the TRFES, which is the basis of the Preferred Alternative of this EIS/EIR, and explicitly rejects the notion that additional flows would be required to satisfy temperature objectives beyond those described in the TRFES:

> "The Hoopa Valley Tribe's temperature objectives agree precisely with those outlined in the TRFE preferred alternative and are consistent with temperature objectives as specified in the NCRWQCB temperature standards for the Trinity River below Lewiston Dam and downstream to Douglas City and the confluence of the North Fork Trinity. *The Tribe's temperature objectives do not require additional flows over and above those required by TRFE"* (Hoopa Valley Tribe, 2000, emphasis added).

It is an established regulatory practice to forego enforcement of water temperature standards during periods of unusually warm ambient air temperature. The Hoopa Valley WQCP follows this practice and explicitly exempts the regulatory entities from responsibility for providing additional cool water to meet temperature objectives in such circumstances:

> "If temperature standards cannot be met due to unusually excessive ambient air temperatures coupled with TRFE level flows, enforcement action will not be pursued against USBR. Excessive air temperature will be determined if the measured 7-day average air temperature during the previous seven-day period of the year exceeds the 90th percentile of the 7-day average daily maximum air temperature calculated in a June 16th through September 14th series over the historic record available with the basin" (Hoopa Valley Tribe, 2000).

The Hoopa Valley Tribe also expressed that they would engage in the biennial review required by the CWA, and would seek to ensure that the water temperature standards are consistent with the TRFES, particularly as it may be modified through the Adaptive Environmental Assessment and Management (AEAM) process. As stated in the Tribe's temperature standards:

> "The Tribe also recognizes that the development and implementation of control technologies and best management practices to reduce human caused warming are ongoing and the achievement of the optimal temperature standard will be an evolutionary process. The Hoopa Tribe will initiate Clean Water Act biennial review amendments, which are consistent with the Adaptive Environmental Assessment and Management (AEAM) principles, outlined in the TRFE as appropriate" (Hoopa Valley Tribe, 2000).

Each alternative was evaluated for its ability to meet the water temperature objectives of the NCRWQCB Plan. Implicit in this evaluation was the inclusion of upstream water temperature conditions that result from different water operations (i.e., withdrawal zone and diversions) of alternatives. The BETTER model, a two-dimensional water temperature model of Lewiston Reservoir, was used to predict Lewiston Dam-release water temperatures. The SNTEMP model subsequently used each alternative's flow schedule and predicted dam-release water temperatures to determine the percentage of time the objectives would be met.

Hydrometeorological conditions used for the evaluations of inriver effects of each alternative were evaluated with cold-wet, median, and hot-dry hydrometeorological conditions. Table 3-7 presents the combinations of flows and release water temperatures necessary to meet temperature objectives under median weather conditions. Table 3-8 presents modeling results for each alternative under median conditions. Cold-wet and hot-dry conditions are presented in the Water Resources/Water Quality Technical Appendix A.

Each alternative was also evaluated for its ability to meet the water temperature objectives of the Hoopa Valley Tribe's WQCP (Hoopa Valley Tribe, 2000). This evaluation relied upon model-predicted dam-release water temperatures from the BETTER model, as well as hydrometeorological conditions of representative years modeled by BETTER. These years included 1977 (critically dry), 1990 (dry), 1989 (normal), 1986 (wet), and 1983 (extremely wet). This evaluation provided estimates of the percentage of time the objectives would be met. These results are provided in Table 3-8A. Additional details of this evaluation are provided in the Water Resources/Water Quality Technical Appendix A.

Each alternative's effect on turbidity, sediment, and water quality of the lower Klamath River were analyzed qualitatively. An evaluation of the flow schedules of the Preferred Alternative (U.S. Fish and Wildlife Service and Hoopa Valley Tribe, 1999) provided information to provide qualitative assessments of the likely effects of alternative flows on water quality in the lower Klamath River. Flow alternatives were assessed for their ability to provide temperatures beneficial to salmonids in the Klamath River and their ability to provide dilution for potentially polluted Klamath River water.

See Section 2.3 Changes to the DEIS/EIR Tables and Figures for new Table 3-8A.

pg. 3-141

Significance Criteria. The following impacts were considered significant for both the Trinity Basin and the Central Valley:

- Substantial degradation of water quality, such that existing beneficial uses are precluded specifically due to adverse water quality.
- Violate any water quality standards or waste discharge requirements.
- Substantial alterations of the course of a stream or river in a manner that would result in substantial erosion or siltation on- or off-site.
- Short- or long-term increases in turbidity of 20 percent or more over naturally occurring background levels.
- Contamination of a public water supply.
- Variation in instream temperatures so as to adversely impact state or federally listed aquatic species (see the Fishery Resources section [3.5]). This is defined as an increase in the number of months with modeled temperatures exceeding the 1993 Winter-run Biological Opinion by more than ~~0.5°F, or a change in carryover storage at Shasta Reservoir compared to No Action. Notably, the use of a 0.5°F change in temperature as a significant impact represents a very conservative approach, in that the~~ any modeled temperature greater than the 56°F threshold criterion (or 60°F depending on date), or a

change in carryover storage at Shasta Reservoir compared to No Action. Notably, the use of no change in temperature greater than the threshold criterion of 56°F (or 60°F) as a significant impact represents a very conservative approach, in that the Central Valley Regional Water Quality Control Board normally considers a temperature change to be significant if a 1.0 degree change occurs.

- Degradation of water quality for a water quality constituent in a waterbody listed as impaired (e.g., under California's Clean Water Act 303(d) list).
- Increases in Delta water quality concentrations for EC, bromide, and DOC of greater than 5 percent, based on the accuracy of analytical methods.

No Action. Exports to the Central Valley would be similar to current operations and would generally maintain current temperatures in the Trinity River (Table 3-8). Modeled violations of Hoopa Valley Tribe water standards ranged from zero violations in the modeled extremely wet year (100 percent compliance) to 31 percent violations in the modeled normal year (69 percent compliance). This is reflective of the two-tiered nature of Hoopa EPA standards, with extremely wet, wet, and normal years being subject to one set of temperature standards, and the dry and critically dry years subject to a different set of standards. Compliance improves in the dry and critically dry water years because the standards are relaxed. Temperature compliance for Hoopa EPA standards is presented in Table 3-8A. Under the No Action Alternative, Sacramento River temperature objectives established in the Biological Opinion would not be met in some months (Table 3-8). These months are distributed across wet to dry hydrology due to the variable nature of the standards depending on water-year class. Carryover violations at Shasta Reservoir would occur in 12 percent of the years (Table 3-9). Existing Trinity River channel rehabilitation projects would be maintained, resulting in occasional, short-term increases in turbidity. Because this alternative does not provide dam releases sufficient in magnitude or duration to emulate pre-TRD flow patterns during the spring and early summer, except possibly in critically dry years, there would be times when water temperatures would be warmer than the Klamath River. Minimum Bay-Delta water quality standards are assumed to be met on a monthly basis.

pg. 3-142

Table 3-9 has been modified to more accurately reflect percent of Sacramento River violations under No Action. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Table 3-9.

Maximum Flow.

Trinity River Basin. The elimination of TRD exports resulted in additional modeled Trinity River temperature violations of NCRWQCB temperature standards in all five water-year classes, compared to No Action levels. The increased frequency of violations reflects the slower rate at which water moves through Lewiston Reservoir (i.e., lack of diversions to the Central Valley), and the associated warming effect (due to the reservoir's relatively shallow depth). The resultant Trinity River temperature impact would be significant. Alternately, this alternative would achieve better compliance with Hoopa EPA temperature standards than No Action in four of the five water-year classes. Maximum Flow would have increased frequency of violations with Hoopa EPA standards in the extremely wet water year. Violations occur because of a combination of higher Lewiston release temperatures and lower

flows. The relatively high flows scheduled in May in the Maximum Flow Alternative preclude the need for spills later in the year, as are needed under the No Action Alternative. Increased violations of Hoopa EPA temperature criteria would be a significant effect. Since this alternative does not include mechanical channel rehabilitation there would be no associated impacts to turbidity.

pg. 3-143

Central Valley. The elimination of TRD exports would significantly reduce the ability to meet temperature criteria in the Sacramento River. This is evidenced by an increase of ~~3~~7 percentage points in the frequency that Sacramento River temperatures would exceed the Biological Opinion temperature objectives, compared to the No Action Alternative. Shasta Reservoir carryover storage violations would increase 2 percentage points compared to No Action due to increased reliance on the reservoir to meet river temperature requirements in spring and early summer. Relative to No Action, modeled X2 position would increase 0.4 km in the average condition, 0.9 km in the wet condition, and 0.1 km in the dry condition. However, as previously noted, PROSIM operates the system to meet water quality standards in the Delta. PROSIM results also project reductions in Delta outflow in a number of months when No Action flows were already low – conditions when Delta water quality is especially susceptible to degradation. DSM2 Delta water quality results show varying increases in average monthly EC, bromide, and DOC concentrations during the months of March through September at Contra Costa Canal Intake, Old River at Highway 4, Delta-Mendota Canal Intake, and Clifton Court Forebay. The greatest increase is at the Delta-Mendota Canal Intake, where EC and bromide levels rise up to 23 percent in critical dry years and 30 percent under average conditions in the high export months of June and July. DOC concentrations are similar to No Action, except in October and November of critical dry years when levels increase up to 9 percent at the Delta-Mendota Canal Intake. Greens Landing and North Bay Aqueduct concentrations are similar to the No Action Alternative for the three constituents. The decreased ability to meet the Biological Opinion criteria and the potential for Delta water quality impacts would be significant impacts.

Flow Evaluation.

Trinity River Basin. ~~The frequency of Trinity River modeled temperature violations decreased in all water-year classes compared to No Action levels.~~ The frequency of Trinity River modeled temperature violations decreased in all water-year classes compared to No Action levels, as measured by compliance with the NCRWQCB and Hoopa EPA water quality criteria, except in extremely wet years where there are no modeled violations of the Hoopa EPA standards for either the Flow Evaluation or the No Action Alternative. This improvement in water temperature is the result of changing TRD export patterns from spring/summer to a summer only. Construction of the 47 new channel rehabilitation projects associated with this alternative would result in potentially significant short-term turbidity impacts in relation to NCRWQCB objectives (actual implementation of the projects would undergo a site-specific environmental review).

pg. 3-144

Central Valley. Sacramento River modeled temperature violations occurred at a ~~slightly~~ higher frequency than under the No Action Alternative (20.5 percent versus ~~19.7~~15.9). Violations occurred in both wet and dry conditions due to the variable nature of the standards. This impact would be significant. Modeled frequency of Shasta Reservoir carryover violations was the same as under No Action. The relatively small increase in frequency of temperature violations and the lack of change in carryover storage violations is at least partially attributable to the increase in demand for water under the 2020 condition. Because demand is forecast to occur downstream of compliance points in the Sacramento River, water deliveries assist in meeting temperature standards. Increased demand in the 2020 period results in lower carryover storage in the Central Valley reservoirs as system wide resources are used to meet demand.

Percent Inflow.
pg. 3-145

Trinity River Basin. Modeled Trinity River water temperature violations increased substantially in comparison to No Action. These violations are due in large part to the fact that summer releases would be as low as 27 cfs. Such low summer flows would be unable to meet temperature objectives, in spite of a shift in TRD exports from spring/summer to summer only. The resultant Trinity River temperature increases would be significant. Likewise, modeled violations of Hoopa EPA temperature standards relative to No Action increase in three of the five modeled water years; extremely wet, dry, and critically dry. The increased violations are a result of lower summer flows. Additional violations of the Hoopa EPA water quality standards would be a significant impact. Construction of 47 new channel rehabilitation projects would result in potentially significant short-term turbidity impacts in relation to NCRWQCB objectives (actual implementation of the projects would undergo a site-specific environmental review).

Central Valley. Sacramento River modeled temperature violations would occur slightly more frequently than No Action levels (20.1 percent versus ~~19.7~~15.9), resulting in a significant impact. The months with violations occur across wet and dry conditions due to the variable nature of the standards. The modeled frequency of Shasta carryover violations was the same as under No Action. In comparison with No Action, modeled position of X2 would increase 0.1 km over the period of record. In the wet condition, X2 would increase approximately 0.2 km. X2 would remain unchanged in the dry period. Delta standards continue to be met under this alternative. PROSIM results also project reductions in Delta outflow in a number of months when No Action flows were already low – conditions when Delta water quality is especially susceptible to degradation. DSM2 Delta water quality results are very similar to the No Action Alternative. The only exception is the increase in average monthly Bromide concentrations of up to 8 percent during the months of April through July, at the Delta-Mendota Canal under average and critical dry conditions. The decreased ability to meet the Biological Opinion criteria and the potential for Delta water quality impacts would be significant impacts.

State Permit.
pg. 3-146

Trinity River Basin. The State Permit Alternative had significantly more modeled water temperature violations due to the fact that summer release rates are too low. These modeled violations occurred in all five water-year classes. More frequent violations of Hoopa EPA temperature standards relative to No Action would occur in four of the five modeled water years. The additional violations are largely a result of lower flows than under No Action. The increased frequency of violations would be a significant impact. This alternative would not result in direct increases in turbidity, as no mechanical restoration projects are proposed.

pgs. 3-146 and 3-147

Central Valley. This alternative would result in a slight increase in temperature violations compared to the No Action Alternative (16.4 percent versus 15.9). Conditions would improve with regard to meeting ~~both Sacramento River temperature and~~ Shasta Reservoir carryover storage objectives as a result of the increased TRD exports compared to No Action levels. These months with temperature violations occurred across both wet and dry conditions due to the variable nature of the standards. Modeled X2 position decreased by 0.1 km in the average and wet conditions, and remained essentially unchanged in the dry period. In general Delta outflow would increase, resulting in improvements in Delta water quality. However, there are some critical dry years when modeled Delta outflows in November and December are reduced due to increased Delta exports to fill San Luis Reservoir (increased Delta pumping is associated with more water being available with this alternative). In these months, average monthly EC and bromide levels increase up to 11 percent at Contra Costa Canal Intake, Old River at Highway 4, Delta-Mendota Canal Intake, and Clifton Court Forebay. Such a potential impact would not be a result of the alternative, in that the effect is attributable to a modeled assumed increase in pumping rather than the alternative itself.

Existing Conditions versus Preferred Alternative.
pg. 3-147

Trinity River Basin. The modeled Preferred Alternative in the year 2020 has fewer temperature violations in the Trinity River than the modeled 1995 existing conditions. This is largely due to the diversion pattern under the Preferred Alternative that reduces Lewiston Reservoir warming in mid- to late-summer and the difference in minimum carryover storage. The most drastic improvement is modeled to occur in the critically dry water-year class. Construction of the channel rehabilitation projects would result in an increase in short-term turbidity impacts compared to existing conditions, resulting in potentially significant short-term turbidity impacts in relation to NCRWQCB objectives (actual implementation of the projects would undergo a site-specific environmental review). The Preferred Alternative would improve compliance over existing conditions in all water-year classes except extremely wet, where compliance would be the same as existing conditions. However, the watershed protection component of the Preferred Alternative would reduce sediment inputs into tributaries, and subsequently, into the Trinity River by 240,000-480,000 yd^3/yr, which is approximately 9-17 percent of the average annual sediment produced in the basin. Implementation of this alternative is assumed to result in beneficial effects.

pgs. 3-147 and 3-148

Central Valley. Modeled Sacramento River temperature violations would occur more frequently under the Preferred Alternative than under 1995 existing conditions (20 percent of the months compared to 14 percent). ~~However, most (87 percent) of the non-compliance is attributed to the increase in water demand assumed for the 2020 level of development.~~ Preferred Alternative carryover storage violations also increased compared to 1995 existing conditions, but all of the increase was attributed to non-project changes (e.g., population growth and higher contract demand). (In other words, the Preferred Alternative and No Action impacts are identical.) While PROSIM operates system resources to meet Delta water quality standards, there is a slight increase in modeled X2 position between existing conditions and the Preferred Alternative. Over the period of record average X2 position would increase approximately 0.4 km. In the wet period, X2 would increase approximately 0.9 km, while in the dry period, X2 is essentially unchanged. PROSIM results also project general reductions in Delta inflow and outflow, as well as a substantial increase in SWP exports at Banks Pumping Plant to meet increased 2020 level demands in the Preferred Alternative relative to existing conditions. Due to these changes in Delta conditions, DSM2 Delta water quality results show increases in average monthly EC, bromide, and DOC concentrations. EC and bromide levels generally increase during the months of October through March at Contra Costa Canal Intake, Old River at Highway 4, Delta-Mendota Canal Intake, and Clifton Court Forebay. The greatest increase is at the Delta-Mendota Canal Intake, where EC and bromide levels rise up to 20 percent in April of critical dry years. DOC concentrations increase up to 8 percent in April and May of critical dry years at the same locations. Greens Landing and North Bay Aqueduct concentrations are similar to the No Action Alternative for the three constituents. The decreased ability to meet the Biological Opinion criteria and the potential for Delta water quality impacts would be significant impacts.

Mitigation.
pgs. 3-149 and 3-150

Significant impacts identified for the increased frequency of Sacramento Basin temperature and carryover storage violations for the Maximum Flow~~, Flow Evaluation,~~ and Percent Inflow Alternatives would need to be evaluated by the NMFS pursuant to the ESA. Such consultation could result in modification of the existing Biological Opinion. Given the result of this consultation is unknown, this significant impact is considered to be unmitigable at this time.

The following mitigation could reduce impacts of temperature violations in the Sacramento River:

- Bypassing the Trinity Powerplant in order to provide colder water for diversion to the Sacramento River (see above).
- Reducing wet-season instream flow requirements for the Sacramento River to increase dry season carryover storage in Shasta Reservoir.
- If approved by EPA, rescheduling the wet season portion of the 200-cfs Iron Mountain Mine dilution flows to spring/summer in a way that would improve Sacramento River temperatures.

Impacts related to implementation of the Flow Evaluation Alternative (Preferred Alternative) were addressed during reconsultation with NMFS (see mitigation for water quality fish-related impacts under Fishery Resources).

The last paragraph on page 3-150 has been revised as follows:

~~Because the outcome of the planning processes described above remains unknown, water quality impacts to salmonid species in the Sacramento River are considered at present to be significant and unavoidable.~~ Additional discussion of these impacts are addressed in Section 3.5, Fishery Resources.

3.5 Fishery Resources *(SEE SUBSECTIONS)*

3.5.1 Native Anadromous Species (CHANGES FOLLOW)
pg. 3-152

Table 3-10 has been modified to include summer and fall rearing for chinook salmon. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Table 3-10.

pg. 3-155

Figure 3-35 has been modified to more accurately depict downstream migration of juvenile chinook salmon and to include the juvenile rearing periods of chinook and coho salmon and steelhead. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Figure 3-35.

Affected Environment.

Trinity River Basin.
pgs. 3-159 and 3-160

Coho Salmon Populations. Trinity River coho salmon populations were historically much smaller than chinook salmon populations. Pre-dam estimates for coho salmon spawning above Lewiston were 5,000 fish (U.S. Fish and Wildlife Service/California Department of Fish and Game, 1956). Returns to Trinity River Hatchery for the period 1973-1980 averaged 3,300 adults (Leidy and Leidy, 1984). An average of 2,700 coho salmon returned to Trinity River Hatchery from 1991 through 1995. During this period, an average of 5,600 coho salmon spawned inriver, of which approximately 98 percent (5,500) were hatchery returns. From 1991 through 1995, naturally produced coho salmon spawning in the Trinity River upstream of the Willow Creek weir averaged 200 fish, ranging from 0 to 14 percent of the total annual escapement (an annual average of 3 percent). ~~Total run size for Trinity River coho salmon below Lewiston Dam for 1973 through 1980 averaged 3,300 adults (Leidy and Leidy, 1984). The estimate includes hatchery produc-tion. From 1991 through 1995 naturally produced coho salmon spawning in the Trinity River upstream of the Willow Creek weir averaged 200 fish, ranging from 0 to 14 percent of the total annual escapement (an annual average of 3 percent). Approximately 8,100 of the coho salmon spawning inriver are produced by the hatchery.~~ The average of 200 naturally produced coho salmon represents approximately 14 percent of the TRRP goal (Table 3-13).

pgs. 3-160 and 3-163

Species Listed and Proposed for Listing under the endangered Species Act (ESA) and California Endangered Species Act (CESA). The Southern Oregon/Northern California ESU of naturally produced coho salmon was listed as threatened pursuant to the ESA on April 25, 1997. This listing includes naturally produced coho from the Trinity River and Klamath River Basins. Critical habitat for the ESU was designted on May 5, 1999.

pg. 3-163

Fish Harvest. The harvest of Klamath River Basin fall chinook salmon (including Trinity River Basin) is managed jointly by the CDFG, Oregon Department of Fish and Wildlife, California Fish and Game Commission, Yurok Tribe, Hoopa Valley Tribe, NMFS, and BIA. The PFMC and the KFMC are allocation forums for the ocean and ocean/inriver fisheries, respectively. The mixed-stock ocean population is harvested by commercial and sport fisheries; and the inriver population is harvested by tribal (ceremonial, subsistence, and commercial) and sport fisheries. Chinook salmon harvest (both fall and spring) includes both naturally produced and hatchery-produced fish. ~~Coho salmon harvest has been prohibited along the west coast since 1994.~~ Coho harvest in the ocean commercial troll fishery has been prohibited in California and Oregon, and reduced in Washington, since 1994. Coho harvest has also been prohibited in the California ocean sport fishery, and reduced in Oregon. Coho harvest is allowed in the tribal inriver fisheries and currently occurs as incidental take during the harvest of chinook salmon. Table 3-13A presents Yurok and Hoopa Valley tribal harvest from 1984-1999. Steelhead are rarely caught in the ocean commercial and sport fisheries, but are harvested by the inriver tribal and sport fisheries.

See Section 2.3 Changes to the DEIS/EIR Tables and Figures for new Table 3-13A.

Central Valley.
pg. 3-168

Many factors affect the abundance of anadromous fishery resources in the Central Valley. Many of the same factors that resulted in declines in fishery resources over the past 150 years continue to plague existing populations. Those factors include: modification and loss of habitat, reduction in magnitude and change in timing of streamflows, damming and diversions, deterioration of water quality (including temperature), ~~increases in~~ sport and commercial harvest, and competition and genetic introgression with hatchery-produced fish. The direct cause and effect relationships of any one or all of these factors as they may have and continue to affect anadromous fish populations are unknown. Cumulatively, they have taken their toll on these species' ability to exist in the Central Valley. Ongoing efforts to arrest the decline and restore native anadromous fish populations, including projects resulting from the 1992 CVPIA, are ongoing in an attempt to reverse the decline of those populations.

3.5.2 Resident Native and Non-Native Fish (CHANGES FOLLOW)

Affected Environment.

Trinity River Basin.
pgs. 3-178 and 3-179

Non-native fish species found in the Trinity and Klamath River Basins include striped bass, American shad, brown trout, and brook trout. Striped bass have only recently been reported to occur in the Trinity and Klamath River Basins; reports are rare. American shad are known to occur in the lowermost portions of the Trinity River Basin, but are primarily found in the lower Klamath River Basin. Anadromous brown trout were propagated in the TRSSH until 1977 when this practice was discontinued because of the small numbers and the lack of anadromous characteristics of fish entering the hatchery. Currently, brown trout are largely limited to the upper portions of the river, although the California Department of Fish and Game, on occasion, capture brown trout in the estuary during the spring ~~some brown trout exhibit anadromous characteristics~~. Brook trout provide a significant sport fishery in the tributary streams and high elevation lakes of the Trinity River Basin. Its life cycle and habitat requirements are similar to that of brown trout.

Mitigation.
pg. 3-178

Anticipated significant impacts to anadromous salmonids in the Trinity River from implementation of the State Permit Alternative would be unmitigatable. Significant impacts requiring mitigation for adverse effects to anadromous salmonids in the Sacramento River system associated with the Maximum Flow~~, Flow Evaluation,~~ and Percent Inflow Alternatives would include reconsultation with NMFS under the 1993 Biological Opinion for Winter Chinook Salmon. In those years (primarily drought conditions) when carryover storage in Shasta Reservoir is less than 1.9 maf, Reclamation and NMFS would re-initiate consultation in an attempt to minimize losses of winter chinook salmon. Reclamation would re-operate Shasta Dam in an effort to reduce losses of winter chinook salmon to less than that resulting in a jeopardy opinion.

Impacts related to implementation of the Flow Evaluation Alternative (Preferred Alternative) were addressed during reconsultation with NMFS.

Per the NMFS' Biological Opinion (2000; under separate cover), implementation of the Preferred Alternative is not likely to jeopardize Southern Oregon/Northern California Coast (SONCC) coho salmon, Sacramento River winter-run chinook salmon, Central Valley spring-run chinook salmon, or Central Valley steelhead. The NMFS does anticipate that SONCC coho salmon habitat adjacent to and downstream of the channel rehabilitation projects associated with the Preferred Alternative may be temporarily degraded during construction. Construction of these projects, which will create a substantial amount of additional suitable habitat, may temporarily displace an unknown number of juvenile coho salmon but is not expected to result in a lethal take. The NMFS does not anticipate that the implementation of the proposed action will incidentally take Central Valley spring-run chinook or Central Valley steelhead, but that the Preferred Alternative will result in a minute increase in the level of Sacramento River winter-run chinook incidentally taken in all years except critically dry years. In such years, Reclamation would be required to reinitiate

consultation per the existing Winter-run Central Valley Project Operations Criteria and Plan to develop year-specific temperature control plans. Implementation of the following reasonable and prudent measures specified in the NMFS BO to minimize the effects of incidental take shall be non-discretionary and will result in minimizing impacts of incidental take of SONCC coho salmon and Sacramento River winter-run chinook salmon in all years including critically dry years:

The Service and Reclamation shall:

1. Implement the flow regimes included in the proposed action (as described in the DEIS/EIR, page 2-19, Table 2-5) as soon as possible.
2. Ensure that NMFS is provided the opportunity to be represented during implementation of the Adaptive Environmental Assessment and Management program.
3. Ensure that the replacement bridges and other infrastructure modifications, needed to fully implement the proposed flow schedule, are designed and completed as soon as possible.
4. Periodically coordinate with NMFS during the advanced development and scheduling of the habitat rehabilitation projects described in the DEIS/EIR.
5. Complete "the first phase of the channel rehabilitation projects" (U.S. Fish and Wildlife Service and U.S. Bureau of Reclamation, 2000) in a timely fashion.
6. Implement emergency consultation procedures during implementation of flood control or "safety of dams" releases from Lewiston Dam to the Trinity River.
7. In dry and critically dry water-year classes, Reclamation and Service shall work cooperatively with the upper Sacramento River Temperature Task Group to develop temperature control plans that provide for compliance with temperature objectives in both the Trinity and Sacramento Rivers.

Implementation of these measures will be non-discretionary.

Lower Klamath River Basin/Coastal Area.
pg. 3-179

The following text has been added on page 3-179 as a new paragraph immediately after the first paragraph under Lower Klamath River Basin/Coastal Area:

Non-native species known to occur in the lower Klamath are similar to those found in upstream areas including the reservoirs. Some of these species include yellow perch, black crappie, green sunfish, gold shiner, and brown bullhead.

Mitigation
pg. 3-184

Anticipated significant impacts to resident fish in the Trinity River from implementation of the State Permit Alternative would be unmitigatable. Mitigation for impacts to the Delta smelt and Sacramento splittail associated with the Maximum Flow and Percent Inflow Alternatives would consist of consulting with the Service on impacts and implementing any required conservation measures.

Implementation of the Flow Evaluation Alternative (Preferred Alternative) was addressed through reconsultation with the Service.

Per the Service's Biological Opinion (2000; under separate cover), implementation of the Preferred Alternative is not likely to jeopardize delta smelt and Sacramento splittail or adversely modify critical habitat for delta smelt. The Service has concurred with the determination that implementing the Preferred Alternative will not likely adversely affect the bald eagle and northern spotted owl. It is anticipated that delta smelt and Sacramento splittail will be adversely affected by implementing the Preferred Alternative and that incidental take may be affected in manner or extent not analyzed in the March 6, 1995 Biological Opinion on the Long-term Operation of the CVP and SWP. Therefore, the following reasonable and prudent measure to minimize the effects of incidental take was developed:

1. Reclamation shall minimize the effects of reoperating the resulting from the CVP implementation of the Preferred Alternative within the Trinity River Basin on listed fish in the Delta.

Implementation of this measure will be non-discretionary.

3.5.3 Reservoirs *(NO CHANGE)*

3.5.4 Ocean Fisheries Economics **(CHANGES FOLLOW)**

Affected Environment.

Trinity River Basin.
pg. 3-192

Ocean Sportfishing. Ocean sport salmon fishing takes place pri-marily from privately owned pleasure craft or charter boats. In 1996, there were 225,500 salmon angler trips for salmon in California and 43,900 in Oregon. About 80 percent of the California trips occurred in the San Francisco and Monterey Regions. About 65 percent of the angler trips for salmon in Oregon coastal waters occurred in the Northern/Central Oregon Coastal Region, which includes the port areas of Coos Bay, Newport, and Tillamook.

Ocean Commercial Fishing. Commercial salmon fishing in the coastal regions has been regulated by the PFMC since 1977. Prior to 1977, the fisheries were regulated by their respective states. ~~since 1977 in California and 1979 in Oregon.~~ Regulation of commercial salmon fishing to protect various stocks of salmon has substantially affected the fishing effort along the West Coast in some years by reducing the number of days when fishing is allowed. This has led to reductions in total catch and associated gross and net income received by the salmon harvesting industry. This has been especially true since 1991 in the Klamath Management Zone (KMZ), a special management area established primarily to protect Klamath and Trinity River salmon (Figure 3-37).

pgs. 3-192 and 3-195

Salmon harvest trends have been somewhat different south of the KMZ, with average harvest levels remaining relatively high through the late 1980s. Since 1989, however, commercial salmon harvest levels in the Mendocino Region (equivalent to the PFMC and CDFG statistical area of Fort Bragg) have fallen, almost disappearing between 1992 and

1995, before increasing to 20,000 salmon in 1996. The 1996 harvest was still 90 percent lower than the 1971-1990 average. Commercial salmon harvests in the San Francisco Region have remained relatively constant over the last 25 years averaging 193,500 salmon harvested per year, although harvests dropped dramatically to 67,000 in 1992 when harvest levels along the West Coast fell substantially. Harvests have rebounded to some extent, with 152,000 salmon harvested in the San Francisco Region in 1996. In 1996, 181,000 salmon were harvested in the Monterey Region, exceeding the average of 104,000 for 1971-1990.

pg. 3-193

Figure 3-37 has been modified to correct a spelling error: "Haceta Head" has been changed to "Heceta Head." See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Figure 3-37.

pg. 3-195

The Oregon ocean commercial salmon fishing industry generated approximately $3.0 million in gross revenue in 1996, with approximately 93 percent of this revenue generated in the Northern/Central Oregon Region and the remainder in the KMZ-Oregon Region. In California, gross revenues from commercial salmon fishing totaled $5.7 million in 1996, which is lower than the $7.8 ~~substantially lower than the $22.7~~ million (in 1997 dollars) in average annual gross income generated by the industry between 1971 and 1990. Net income received by the salmon harvesting industry has historically averaged approximately 33 percent of gross salmon revenues in Oregon and 39 percent of gross salmon revenues in California.

pgs. 3-196 through 3-203

Tables 3-19 and 3-20 were inserted in the DEIS/EIR in reverse order. The table numbers and placement in text have been corrected. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised table numbers.

Environmental Consequences.
pg. 3-199

No Action. Angler benefits associated with ocean sportfishing for salmon are shown by region in Tables 3-20 and 3-21. Across all regions, this alternative generates an estimated ~~$35.2~~$42.2 million in angler benefits, with San Francisco and Monterey accounting for ~~nearly 56~~ more than 46 percent of all angler benefits. Harvest levels, gross revenues, and net income associated with ocean commercial fishing for salmon are shown in Table 3-21. Under the No Action Alternative, net income associated with ocean commercial fishing for salmon across all regions is estimated at $6.8 million, with the Northern/Central Oregon Coastal Region accounting for nearly 40 percent of this total.

3.6 Tribal Trust *(NO CHANGE)*

3.7 Vegetation, Wildlife, and Wetlands *(SEE SUBSECTIONS)*

3.7.1 Vegetation **(CHANGES FOLLOW)**
pg. 3-230

Table 3-24 has been modified to more accurately define the classifications under the Califonia Native Plant Society. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Table 3-24.

pg. 3-233

Table 3-25 has been modified to more clearly and accurately define the classifications under the California Native Plant Society. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Table 3-25.

Environmental Consequences.
pg. 3-238

Significance Criteria. Impacts on vegetation would be significant if project implementation would result in any of the following:

- Potential for reductions in the number, or restrictions of the range, of an endangered or threatened plant species or a plant species that is a candidate for state listing or proposed for federal listing as endangered or threatened
- Potential for substantial reductions in the habitat of any native plant species including those that are listed as endangered or threatened or are candidates (CESA) or proposed (ESA) for endangered or threatened status
- Potential for causing a native plant population to drop below self-sustaining levels
- Potential to eliminate a native plant community
- Substantial adverse effect, either directly or through habitat modifications, on any plant identified as a sensitive or special-status species in local or regional plans, policies, or regulations
- Substantial adverse effect on any riparian habitat or other sensitive natural community identified in local, ~~or~~ regional, or state plans, policies, or regulations
- Substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means
- A conflict with any local policies or ordinances protecting vegetation resources
- A conflict with, or violation of, the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, state, or federal habitat conservation plan relating to the protection of plant resources

3.7.2 Wildlife *(NO CHANGE)*
3.7.3 Wetlands *(NO CHANGE)*

3.8 Recreation *(SEE SUBSECTIONS)*

3.8.1 Riverine **(CHANGES FOLLOW)**

Affected Environment.

Trinity River Basin.
pg. 3-262

Federal, State, and Local Plans/Wild and Scenic River Designations. Congress enacted the National Wild and Scenic Rivers Act in 1968, in an effort to protect free-flowing rivers with "outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values." The entire mainstem of the Trinity River was designated a National Wild and Scenic River by the Secretary in 1981, primarily because of the river's anadromous fishery (46 FR 7484). In addition, the reach of the river downstream from Lewiston Dam was classified as having distinctive scenic quality and high peak flow viewer sensitivity[11]. Approximately 97.5 miles of the river are also classified as recreational under the Act.

pg. 3-263

Recreation Resources and Opportunities. During the primary recreation season, water-dependent and water-enhanced Trinity River recreation includes boating, kayaking, canoeing, rafting, inner-tubing, fishing, swimming, wading, camping, gold panning, nature study, picnicking, hiking, and sight-seeing[12]. In addition, fishing for chinook salmon, steelhead, and rainbow and brown trout is a major recreational activity on the Trinity River throughout the remainder of the year as well as some boating activities.

Environmental Consequences.

Methodology.
pg. 3-264

Recreation Opportunities Methodology. The mainstem of the Trinity River is the primary focus of the recreational opportunities analysis. During the primary recreation season, Trinity River flows are most influenced by Lewiston releases in the summer months given tributary flow is generally not much of a factor during this period. Many of the recreation activities, in particular white-water kayaking and rafting, are most prevalent downstream of the river's confluence with the North Fork of the Trinity River. At this location, Lewiston releases play a minor role in Trinity River flows compared to inflows from the North Fork. Impacts to recreational opportunities within the lower Klamath River Basin, aside from sportfishing, are considered to be less than significant as the limited amount of recreation that does occur in this reach of the river is not substantially influenced by Lewiston Dam releases. (Impacts to ocean sportfishing are discussed in Section 3.5.4, Ocean Fishery Economics.)

[11] At peak flows, the scenic qualities of the river are enhanced.

[12] The primary recreation season is defined as Memorial Day to Labor Day, or approximately the last week of May to the end of the first week in September.

pg. 3-265

Recreation Use and Benefits Methodology. The methodology for determining recreation use and benefits within the Trinity River Basin and the Lower Klamath River Basin/Coastal Area is based on river flow and fish population conditions. Annual recreation use relationships were estimated for four activities that occur along the river: boating, swimming, fishing, and hiking and other river-enhanced activities (i.e., off-river activities). The relationship of river flow and fish populations to these activities was generally found to be positive, implying the greater the flow or fish population, the greater the expected inriver recreation use. Due to model limitations, the recreation use and benefit analyses do not account for species substitution.

pg. 3-267

Table 3-32 has been modified to more accurately reflect white-water activities and preferred flow ranges. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Table 3-32.

Flow Evaluation.

Trinity River Basin.
pg. 3-269

Despite the adverse temporary impacts to recreation opportunities as listed above, overall annual recreation use on the Trinity River is expected to increase by 91,600 visitor days, or about 22 percent, as compared to No Action levels (Table 3-34). Boating and fishing activities are expected to increase the most. Annual recreation benefits are estimated to increase by $3.3 million.

pgs. 3-273 and 3-275

Table 3-33 has been modified to more accurately reflect white-water conditions. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Table 3-33.

3.8.2 Reservoirs (CHANGES FOLLOW)

Environmental Consequences.
pg. 3-282

No Action.

Trinity River Basin. Under the No Action Alternative, use of certain boating facilities, such as the Stuart Fork boat ramps, Fairview Ramp, and major marinas would continue to be moderately constrained during the recreation season (See Table 3-36). Recreation use of Trinity Reservoir is expected to be about ~~796,000~~ 803,600 visitor days in 2020. Annual recreation benefits are estimated to be $~~8.7~~8.8 million (Table 3-37 at end of Section 3.8.2).

Maximum Flow.

Trinity River Basin. Under the Maximum Flow Alternative, Trinity Reservoir levels would generally be lower than No Action levels during the recreation season. A number of major recreation facilities would be less available compared to No Action levels (Table 3-36). This decrease in facility availability would be a significant impact. Annual recreation use of

Trinity Reservoir is expected to decrease by ~~30,000~~37,400 visitor days, or about ~~4~~ 5 percent, compared to No Action levels. Recreation benefits would decrease by $~~327,000~~ 408,000 annually.

pg. 3-283

Flow Evaluation.

Trinity River Basin. Trinity Reservoir water-surface elevations would not be significantly below threshold levels for any of the major facilities under this alternative. Projected recreation facility availability would decrease slightly for Stuart Fork Ramps and Fair View Ramp. Major marina relocations would be required 2 percent less often as compared to the No Action Alternative. Under the Flow Evaluation Alternative, the availability of Trinity Center Ramp and Minersville Ramp would remain unchanged from No Action, and campground availability would increase by 1 percent. Annual recreation use is expected to be essentially the same as under the No Action Alternative. Recreation use and benefits would change by less than 1 percent. ~~Recreation facility availability would increase slightly compared to No Action levels. Annual recreation use is expected to increase by 6,600 visitor days, or about 1 percent, compared to No Action levels. Recreation benefits would increase by $71,900 annually.~~

Percent Inflow.

Trinity River Basin. Under the Percent Inflow Alternative, Trinity Reservoir levels would drop slightly in summer months compared to No Action levels, resulting in a slight decrease in the usability of certain recreation facilities, including the Stuart Fork Ramp, the Fairview Ramp, and the Trinity Center Ramp. However, no significant decrease in facility availability is anticipated. However, campground use is predicted to increase slightly compared to No Action conditions because of better access conditions. ~~Overall, annual recreation use of Trinity Reservoir is expected to increase by 13,500 visitor days, or about 2 percent, compared to No Action levels. Recreation benefits would increase by $147,200 annually.~~ Overall, annual recreation use of Trinity Reservoir is expected to be essentially the same as under No Action (model predictions show use and benefits increasing by less than 1 percent).

pg. 3-284

State Permit.

Trinity River Basin. Under the State Permit Alternative, Trinity Reservoir levels would be slightly higher during the primary recreation season as compared to the No Action Alternative. The availability of all recreation facilities would increase compared to No Action levels, except for the Minersville Ramp, which would remain available during the entire recreation season for both alternatives. Annual recreation use of Trinity Reservoir would increase by ~~44,800~~37,400 visitor days, or about ~~6~~ 5 percent. Recreation benefits would increase by $~~488,300~~408,000 annually.

pg. 3-287

Table 3-36 has been modified to correct Trinity Reservoir recreation facility availability data. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Table 3-36.

pg. 3-289

Table 3-37 has been modified to more accurately reflect Trinity Reservoir recreation benefits and visitor days under the No Action Alternative. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Table 3-37.

pg. 3-291

Table 3-38 has been modified to more accurately reflect Trinity Reservoir recreation benefits and visitor days under the No Action Alternative. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Table 3-38.

3.9 Land Use *(SEE SUBSECTIONS)*

3.9.1 Residential/Municipal and Industrial **(CHANGES FOLLOW)**

Environmental Consequences.

Methodology.
pg. 3-302

Any new supplies acquired to eliminate shortfall in the average condition are assumed to be available to reduce shortage in the dry condition. Therefore, ~~incremental costs in the dry condition are reduced by supplies acquired to meet demand in the average condition~~ dry condition costs, which are above and beyond average condition costs, consider the yield of all supplies developed to meet average demand.

No Action.

Central Valley/CVP Service Area.
pg. 3-305

Regionwide, the Bay Area would have more than adequate supplies (an assumed excess of 8,800 af) due in part to a surplus in the South Bay subregion (14,600 af). This does not imply that additional supplies during average years will never have economic value. Rather, it is expected that most additional water supplies obtained in above-average years will not be needed. However, the CCWD is assumed to need to acquire 5,800 af of new supplies to meet demand.

Existing Conditions versus Preferred Alternative.
pg. 3-310

Central Valley. Table 3-42 at the end of Section 3.9.1 compares the Preferred Alternative in 2020 to existing conditions (i.e., 1995). Population across all regions in the year 2020 is assumed to be approximately double that of the existing conditions population, resulting in an increase in demand. As described in Section 2.1.2, ~~CVP supplies for M&I use are assumed to increase to meet this demand~~ maximum deliveries unconstrained by supply are able to increase up to current contract or water rights amounts unless local environmental documentation for increased use is not completed.

3.9.2 Agriculture *(NO CHANGE)*

3.9.3 Real Estate **(CHANGES FOLLOW)**

pg. 3-329

This section assesses each of the alternatives from the perspective of residential real estate impacts. The evaluation focuses on residential properties adjacent to reservoirs~~ and rivers~~. River properties were not evaluated due to the ambiguous nature of the overall impact. Since some river properties may benefit from the improved fishery and others may suffer from flooding, no clear relationship could be assumed.

Affected Environment.

Trinity River Basin. Trinity Reservoir is the only reservoir in this region where residential real estate impacts are expected. Lakeside development is limited to Trinity Center and Covington Mill, both of which are located on the west side of the reservoir along Route 3. ~~The potentially affected reach of the Trinity River consists of the portion downstream of Lewiston Dam. A number of small residential communities are found along this reach including Lewiston, Douglas City, Junction City, Big Bar, Del Loma, Burnt Ranch, Salyer, and Willow Creek.~~

pg. 3-330

Lower Klamath River Basin/Coastal Area. ~~The affected area in this region is limited to the lower reach of the Klamath River downstream of Weitchpec. This area falls entirely within the boundaries of the Yurok Reservation.~~ No impacted reservoirs are found in this region.

Environmental Consequences.

Methodology. Real estate impacts were assessed based on the assumed relationship between residential property values and ~~both~~ reservoir water levels~~ and inriver fish harvests~~. Since information for quantifying changes to property values was unavailable, the speculated relationship allowed only for a ranking of the alternatives.

~~Based on the assumptions that people prefer to live along healthy rivers, and fish harvests reflect river health, naturally produced salmon and steelhead inriver fish harvests were used to rank potential impacts to Trinity River property values. Implicit in this assumption are higher flows and possible flooding; however, flooding effects were discounted under the assumption that such impacts would be mitigated (see Section 3.9.1). Impacts to property values along the lower Klamath River were not assessed because of the high level of uncertainty about a relationship between Trinity River fish harvests and lower Klamath land values.~~

Significance Criteria. Property value significance criteria were not established because of the uncertainty in estimating quantitative relationships between property values and reservoir water levels~~ and inriver fish harvests.~~

pg. 3-331

No Action.

Trinity River Basin. The No Action Alternative assumes the current flow schedule would continue. Based on average water levels and annual monthly fluctuation, this alternative ranked ~~fourth~~ fifth overall from the perspective of Trinity Reservoir property value impacts (Table 3-43). ~~From a Trinity River property value perspective, this alternative ranked fifth.~~

Maximum Flow.

Trinity River Basin. This alternative ranked second overall in terms of Trinity Reservoir property values. From the long-term perspective, this alternative ranked first; however, from the short-term perspective, this alternative ranked last. ~~The alternative ranked first in terms of Trinity River property values (harvest levels were ten times those of No Action).~~

Flow Evaluation.

Trinity River Basin. By placing second in each of the three water level measures, this alternative ranks first overall ~~F~~from a Trinity Reservoir property value perspective~~, this alternative ranks first overall. From a Trinity River property value perspective, this alternative ranked second~~.

Percent Inflow.

Trinity River Basin. This alternative ranked ~~third~~ fourth overall in terms of Trinity Reservoir property values ~~(tied with State Permit Alternative). From a Trinity River property value perspective, this alternative ranked third~~.

Mechanical Restoration.

Trinity River Basin. This alternative ranked ~~fourth~~ fifth overall in terms of Trinity Reservoir property values (tied with No Action due to the identical hydrology). ~~This alternative also ranked fourth from a Trinity River property value perspective.~~

pg. 3-332

State Permit.

Trinity River Basin. The State Permit Alternative ranked first based on short-term drawdown to Trinity Reservoir, but last based on long-term fluctuation. Overall, the alternative tied for third in terms of Trinity Reservoir property values. ~~From a Trinity River perspective, the alternative ranked last.~~

Existing Conditions versus Preferred Alternative.

Trinity River Basin. In terms of Trinity Reservoir water levels, the Preferred Alternative in the year 2020 was virtually identical to 1995 conditions from the short-term drawdown perspective, but substantially better in terms of long-term fluctuations. Therefore, the Preferred Alternative would increase property values. ~~Trinity River fish harvests are expected to increase under the Preferred Alternative compared to 1995; therefore, property values along the river should increase.~~

pg. 3-333

Table 3-46 has been modified to more accurately reflect Trinity Reservoir property value impact rankings under each alternative. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Table 3-46.

3.10 Power Resources (CHANGES FOLLOW)

Affected Environment.

pg. 3-335

The following text has been added immediately after Affected Environment:

CVP Generation in Relation to Total California Generation and Demand. California's annual energy demand in 1998 was approximately 250,000 gigawatt-hours (GWh) (California Energy Commission, 2000). Demand for energy is projected to grow at approximately 2.0 percent annually between 2000 and 2010, resulting in a projected demand of 320,000 GWh in 2010. Peak demand in California typically occurs in late afternoons during the month of August in response to a string of days with high-temperatures (California Energy Commission, 1999). California's peak demand in 1999 was approximately 51,000 MW and is projected to grow at approximately 1.7 percent annually between 2000 and 2010, resulting in a peak demand of 61,000 MW in 2010. In comparison, total installed capacity of CVP generation is approximately 2,000 MW, although actual capacity is typically less. Actual capacity is less than installed capacity because hydrologic variation and competing uses such as water delivery and environmental requirements reduce the ability of the generators to operate at maximum capacity. The total installed CVP generation capacity of 2,000 MW equates to 4 percent of California demand in 1999, and 3 percent of projected 2010 demand. The TRD accounts for 25 percent (approximately 500 MW) of CVP installed capacity, which equates to approximately 1 percent of current California demand, and less than 1 percent of projected 2010 demand.

Currently, according to the Western Systems Coordinating Council, approximately 3,700 MW (which represents more than the total generation capability of the entire CVP) of new powerplants (six individual projects in total) in California are either under construction or have gained full regulatory approval. Approximately 7,500 MW of new powerplants (15 projects) have applications under review, and another 2,000 MW of new powerplants (three projects) have begun the application process. The majority of pending and proposed powerplants are natural gas-fired turbines, and a small minority (approximately 100 MW) would be either wind or geothermal powered. All of these powerplants have an anticipated "on-line" date prior to June 2004. Recent demand growth has outstripped current available capacity, leading to several statewide alerts regarding insufficient reserves of available capacity. Completion of additional powerplants is anticipated to help avoid such alerts in the future. Construction of additional generating capacity is taking place, and will continue to take place, independent of any decision regarding the Trinity River Mainstem Fishery Restoration.

Power Generation and Purchase.
pg. 3-340

Current Power Marketing. ~~The value of CVP hydropower available for sale is determined by the market.~~ Western sets prices for CVP hydropower based on its costs for delivering power to customers. However, the value of power that Western sells to customers is set by the external power market and can fluctuate based on on- and off-peak supplies. Although the value and annual project output can fluctuate, Western's costs remain essentially unchanged. This causes Western's per-unit cost of electricity to vary. When long-term average generation decreases, Western's customers receive less electricity and are required to pay a higher per-unit cost. If Western rates are relatively low, Western customers are likely to continue to purchase power from Western as part of their long-term resource mix. For planning purposes, power customers evaluate capacity resources based on dry conditions in order to ensure reliability.

Methodology.
pg. 3-346

The following text has been added as the first paragraph immediately after Methodology:

A detailed assessment regarding the impact of CVP power supplies on the greater California region has not been made, other than what is presented in the Socioeconomics section. It is anticipated that as demand for power increases, additional power supplies will be built to meet the increase in total California demand. As this occurs, the CVP's current total contribution of meeting 4 or less percent of total California electrical demand will constitute a decreasing proportion of the state's overall power generation supply.

The value of energy produced by the CVP was estimated using a marginal ~~unit efficiency~~ heat rate approach, meaning that as low-cost generating resources are ~~decreased~~ loaded (supplying power to their maximum capacity), higher-cost, less efficient resources are brought on-line as they become economically viable. Value was assigned to generation based on the month and time of day in order to assess on-peak and off-peak generation.

Significance Criteria.
pg. 3-349

In order to assess the severity of the impacts, the following significance criteria were developed:

- A 50 MW reduction in synthetic dry-year capability available for sale to preference power customers in January, February, March, June, July, August, September, or December (the months typically most sensitive to reduced capacity). Capability is defined as the amount of CVP capacity that can be sustained (given flow constraints) that efficiently supplies electricity to meet demands.
- A reduction of 5 percent or more in the annual energy available for sale to preference power customers ~~over the modeled period~~ in the average year.

- A reduction of 5 percent or more in the average energy available for sale to preference power customers during any month ~~over the modeled period~~ in the average year.
- Any decrease in CVP power that results in an increase in either an average preference power customer or a high-allocation preference power customer's average power cost by $0.50 per megawatt-hour (MWh).

Mitigation.
pgs. 3-350 and 3-351

The following text has been added as the first paragraph, moving the original first paragraph to the place of second paragraph, immediately following Mitigation:

Operating criteria would be established to allow Western to respond to various emergency situations in accordance with their obligations to the North American Electric Reliability Council. This commitment would also provide for exemptions to a given alternative's operating criteria during search and rescue situations, special studies and monitoring, dam and powerplant maintenance, and spinning reserves. Such exemptions for responding to various emergency situations would be consistent with the Presidential Memorandum, dated August 3, 2000, directing federal agencies to work with the State of California to develop procedures governing the use of backup power generation in power shortage emergencies.

Potentially significant power-related impacts could occur as a result of decreased surface-water supplies associated with the Maximum Flow, Flow Evaluation, and Percent Inflow Alternatives. Although water supply changes per se were not considered an impact, the development of additional water supplies to meet demands would lessen the associated impacts. Conceptually, any additional water supply or demand reduction would free up water for use by other, competing uses. A number of demand-and supply-related programs are currently being studied across California, many of which are being addressed through the on-going CALFED and CVPIA programs and planning processes. Although none of these actions would be directly implemented as part of the alternatives discussed in this DEIR/EIS, each could assist in offsetting impacts resulting from decreased Trinity River exports.

Power-related benefits associated with such programs would only occur if operations were conducted to provide increased generation; otherwise, implementation of such programs could negatively affect power resources.

Examples of actions being assessed in the CALFED and CVPIA planning processes include:

- Develop and implement additional groundwater and/or surface-water storage. Such programs could include the construction of new surface reservoirs and groundwater storage facilities, as well as expansion of existing facilities. Potential locations include sites throughout the Sacramento and San Joaquin Valley watersheds, the Trinity River Basin, and the Delta.
- Purchase long- and/or short-term water supplies from willing sellers (both in-basin and out-of-basin) through actions including, but not limited to, temporary or permanent land fallowing.

- Facilitate willing buyer/willing seller inter- and intra-basin water transfers that derive water supplies from activities such as conservation, crop modification, land fallowing, land retirement, groundwater substitution, and reservoir re-operation.
- Promote and/or provide incentive for additional water conservation to reduce demand.
- Decrease demand through purchasing and/or promoting the temporary fallowing of agricultural lands.
- Increase water supplies by promoting additional water recycling.
- Develop or construct generation for use by CVP customers.
- Purchase replacement power resources to offset losses of CVP generation.
- Modify the current CVP Cost Allocation policy to ensure that costs allocated to CVP preference power customers are reduced in an amount equal to the cost of acquiring replacement power.

pg. 3-353

Table 3-49 has been modified to more clearly and accurately reflect costs comparing existing conditions to the Preferred Alternative. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Table 3-49.

3.11 Socioeconomics (CHANGES FOLLOW)
pg. 3-355

This section presents regional information on socioeconomic conditions and impacts. As required by NEPA, the impacts of each alternative are compared to the No Action Alternative generally represented by ~~in the year~~ 2020 conditions (except for up-front impacts, which are based on 2001 conditions). While impacts are generally based on 2020 conditions, for purposes of consistency, all dollar estimates reflect 1997 dollars unless otherwise stated. Although CEQA does not require any discussion of socioeconomic impacts, this section nevertheless, to be consistent with other sections, compares the impacts of the Preferred Alternative in the year 2020 (Flow Evaluation plus watershed protection work from the Mechanical Restoration Alternative) to existing conditions, i.e., 1995.

Affected Environment.

Central Valley.
pg. 3-366

Current Social Conditions. Central Valley farmers who depend on irrigation are being affected by a wide array of decisions affecting their way of life, many of which are outside their control. For example, changes in farm subsidies and water supplies are accumulating. While farming has always had risks and uncertainties associated with it, recent changes have increased those elements. The loss of control some farmers feel has increased their stress and concern for maintaining their way of life.

Environmental Consequences.

Maximum Flow.

Trinity River Basin.
pg. 3-375

Up-front Impacts. The costs associated with the Maximum Flow Alternative are expected to generate $3.6-6.2 million in total industry output, $1.8-3.0 million in place of work income, and 45-77 additional jobs depending on the dam modification option (Table 3-54). This represents more jobs in Trinity County than any other alternative due primarily to the dam modification component. These dam modification costs are anticipated to last at most a couple of years, implying only a short-term impact. After dam modification is complete, job generation drops off dramatically. The 77 additional jobs reflect an insubstantial 1.5 percent of projected 2001 Trinity County employment. Despite the fact that the dam modification costs are based on preliminary estimates, it is likely that the up-front cost-based impacts involve a higher degree of certainty compared to the annual 2020 impacts given their near-term nature and recent experience with several of the cost elements.

Annual Impacts.
pgs. 3-375 and 3-376

2020 Economic Impacts: Under the Maximum Flow Alternative, the Trinity/Shasta County regional economy would be negatively affected by decreases in spending associated with water-oriented recreation. Although recreation-related spending associated with use of the Trinity River would increase, these effects would be more than offset by decreases in recreation-related spending associated with use of Trinity and Shasta Reservoirs. Annual regional economic output would decrease by an estimated $~~6.3~~ 6.6 million, place of work income by $~~2.6~~ 2.7 million, and employment by ~~66~~ 70 jobs (Table 3-54). These changes are not considered substantial. Revenues specific to businesses in Trinity County are estimated to increase $2.0 million annually.

The economic sectors most affected by recreation activity are wholesale trade, retail trade, and lodging places. Annual employment in these sectors is estimated to decrease by ~~39~~ 41 jobs, with ~~25~~ 26 of those occurring in the retail trade sector. These impacts are not considered substantial.

Flow Evaluation.

Trinity River Basin.

Annual Impacts.
pg. 3-382

2020 Economic Impacts: Under the Flow Evaluation Alternative, the Trinity/Shasta County regional economy would be positively affected by increases in spending associated with increases in water-oriented recreation. Recreation-related spending associated with increases in use of the Trinity River and Trinity Reservoir would more than offset the decreases in recreation-related spending associated with projected declines in use at Shasta Reservoir. Annual regional economic output would increase by an estimated $~~3.2~~$3.0 million, place of work income would increase by $~~2.0~~ 1.8 million, and employment

would increase by ~~66~~ 62 jobs (Table 3-51). These increases are not considered substantial. Revenues specific to businesses in Trinity County are estimated to increase $1.7 million annually.

The economic sectors most affected by recreation activity are wholesale trade, retail trade, and lodging places. Annual employment in these sectors is estimated to increase by ~~43~~ 41 jobs, with ~~41~~ 39 of those occurring in the retail trade and lodging sectors. These impacts are not considered substantial.

Percent Inflow.

Trinity River Basin.

Annual Impacts.
pg. 3-387

2020 Economic Impacts: Under the Percent Inflow Alternative, the Trinity/Shasta County regional economy would be negatively affected by decreases in spending associated with declines in water-oriented recreation. Although recreation-related spending associated with use of Trinity Reservoir would increase, these effects would be more than offset by decreases in recreation-related spending associated with declines in use at Shasta Reservoir and along the Trinity River. Annual regional economic output would decrease by an estimated $~~500,000~~ 800,000, place of work income would decrease by $~~300,000~~400,000, and employment would decrease by ~~8~~ 12 jobs (Table 3-54). These decreases, however, are not considered substantial. Revenues specific to businesses in Trinity County are estimated to increase by less than $10,000 annually.

The economic sectors most affected by recreation activity are wholesale trade, retail trade, and lodging places. Annual employment in these sectors is estimated to decrease by ~~5~~7 jobs, with ~~3~~4 of those occurring in the retail trade sector. These impacts are not considered substantial.

Mechanical Restoration.

Trinity River Basin.

Annual Impacts.
pg. 3-392

2020 Economic Impacts: The Trinity/Shasta County regional economy would be positively affected by the Mechanical Restoration Alternative. The only changes in recreation-related spending would be associated with slight increases in use of the Trinity River for sportfishing. Annual regional economic output would increase by an estimated $~~110,000~~130,000, place of work income would increase by $~~60,000~~70,000, and employment would increase by 2 jobs (Table 3-54). These increases are not considered substantial. Revenues specific to businesses in Trinity County are estimated to increase by less than $50,000 annually.

State Permit.

Trinity River Basin.

Annual Impacts.
pgs. 3-395 and 3-396

2020 Economic Impacts: Under the State Permit Alternative, the Trinity/Shasta County regional economy would be negatively affected by decreases in spending associated with declines in Trinity River recreation. Although recreation-related spending associated with use of Trinity and Shasta Reservoirs would increase, these effects would be more than offset by decreases in recreation-related spending along the Trinity River. Annual regional economic output would decrease by $~~5.9~~ 6.2 million, place of work income would decrease by $~~3.5~~ 3.6 million, and employment would decrease by ~~115~~ 119 (Table 3-54) jobs. These changes are not substantial. Revenues specific to businesses in Trinity County are estimated to decrease by $1.8 million annually.

The economic sectors most affected by recreation activity are wholesale trade, retail trade, and lodging places. Annual employment in these sectors is estimated to decrease by ~~74~~ 76 jobs, with ~~70~~72 of those occurring in the retail trade and lodging sectors. The adverse impacts on the lodging sector are substantial.

No Action versus Preferred Alternative.
pg. 3-400

The following two sentences were erroneously placed under Up-front Impacts in the DEIS/EIR. They have been deleted from Up-front Impacts and have been added to No Action versus Preferred Alternative.

The Preferred Alternative consists of the Flow Evaluation Alternative plus the watershed protection component of the Mechanical Restoration Alternative. Therefore, all socioeconomic impacts associated with the Preferred Alternative, other than costs, are identical to those of the Flow Evaluation Alternative.

Trinity River Basin.

Up-front Impacts. ~~The Preferred Alternative consists of the Flow Evaluation Alternative plus the watershed protection component of the Mechanical Restoration Alternative. Therefore, all socioeconomic impacts associated with the Preferred Alternative, other than costs, are identical to those of the Flow Evaluation Alternative.~~ The costs associated with the Preferred Alternative are expected to generate $2.1 million in output/sales, $1.1 million in income, and 37 jobs annually in Trinity County (Table 3-54). The majority of these impacts stem from the combined cost of constructing the channel rehabilitation sites and the watershed protection program. Impacts taper off gradually until the channel rehabilitation sites are completed in year 6. At that point, impacts decline by 50 percent and represent primarily the watershed protection program. Given the peak level of job creation represents less than 1 percent of the projected total employment in Trinity County in 2001, the total impacts associated with the Preferred Alternative are not substantial.

Existing Conditions versus Preferred Alternative.

Trinity River Basin.

Economic Impacts.
pg. 3-401

Annual Impacts: Under the Preferred Alternative, the Trinity/Shasta County regional economy would be positively affected by increases in spending associated with increases in water-oriented recreation. Annual regional economic output would increase by $2.6 billion, place of work income would increase by $~~1.4~~ 1.5 billion, and employment would increase by 35,900 jobs (Table 3-54). More than 99 percent of these changes in economic activity are attributable to the effects of increased population on recreation use and spending associated with the Trinity River and Trinity and Shasta Reservoirs. Project-related effects are not substantial.

pgs. 3-405 through 3-410

Tables 3-54 and 3-55 have been modified to more accurately reflect annual economic impacts under each alternative. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Tables 3-54 and 3-55.

3.12 Cultural Resources (CHANGES FOLLOW)

Environmental Consequences.
pg. 3-417

Flow Evaluation. ~~Trinity Reservoir levels would be lower than levels under the No Action Alternative in all months.~~ The increased frequency of water levels fluctuations compared to No Action could result in increased exposure of cultural resources within the inundation zone. Such an impact could be significant.

3.13 Air Quality *(NO CHANGE)*

3.14 Environmental Justice (CHANGES FOLLOW)

Environmental Consequences.

Maximum Flow.

Trinity River Basin and Lower Klamath River Basin/Coastal Area.
pg. 3-427

With the exception of the San Francisco Coastal Area, there would be no substantial environmental justice impacts to non-Native Americans in the Trinity River Basin and Lower Klamath River Basin/Coastal Area. In the San Francisco Coastal Area the adverse impacts on ~~agriculture~~ agricultural employment would be concentrated in the Santa Clara Valley. The demographics of Santa Clara County indicate that the alternative would have substantial environmental justice impacts. In 1996, the minority and Hispanic populations were 47 and 23 percent, respectively, of the county's population, with over 80 percent of the farm workers in the county being of Hispanic descent.

Central Valley. Substantial adverse agricultural employment impacts would occur in the Tehama-Colusa service area. This area includes Glenn, Colusa, and Yolo Counties. Based

on Census Bureau data, 18.7, 17.3, and 15.5 percent, respectively, of the people in these counties live below the poverty level, compared to 16.5 and 13.8 percent, respectively, for the state of California and the United States. Only Colusa County has a minority population greater than 40 percent. With impacts being specific to the agricultural sector, and most of the farm workers being Hispanic, the loss of jobs by Hispanic farm workers in Colusa County would be a substantial environmental justice impact.

Substantial adverse agricultural employment impacts would occur along the San Luis Canal for those users entirely dependent on CVP contracts. This includes the counties of Merced and Madera. Census Bureau data indicate that both counties have significant minority populations, low median incomes, and high percentages of people in poverty (25.9 and 20.8 percent, respectively). Therefore, the substantial impacts to agriculture would have substantial environmental justice impacts in these two counties.

4.0	**Other Impacts and Commitments**	*(SEE SUBSECTIONS)*
4.1	**Cumulative Impacts**	*(SEE SUBSECTIONS)*
4.1.1	**Implementation of Central Valley Project Improvement Act**	*(NO CHANGE)*
4.1.2	**SWRCB Water Rights Process and CALFED Bay-Delta Program**	*(NO CHANGE)*
4.1.3	**Deregulation of Electric Industry in California**	*(NO CHANGE)*
4.1.4	**Changes in Federal Farm Support Programs**	*(NO CHANGE)*
4.1.5	**Changes in Demand for Agricultural Products**	*(NO CHANGE)*
4.1.6	**Changes to Fisheries Management**	*(NO CHANGE)*
4.1.7	**Changes in Demand for Recreational Opportunities**	*(NO CHANGE)*
4.1.8	**Changes in Trinity River Basin Consumptive Water Use**	*(NO CHANGE)*
4.1.9	**Five Counties Coho Conservation Program**	*(NO CHANGE)*
4.1.10	**Total Maximum Daily Load (TMDL)**	*(NO CHANGE)*
4.1.11	**Lower Klamath Restoration Partnership**	*(NO CHANGE)*
4.1.12	**Changes in California Forest Practice Rules**	*(NO CHANGE)*

~~4.1.13 Tribal Water Quality Control Planning~~ **(CHANGES FOLLOW)**
pg. 4-11

~~Pursuant to Section 303(c) of the federal Clean Water Act, the EPA is authorized to delegate water quality authority to federally recognized Indian tribes. The Hoopa Valley Tribal Council (HVTC) has received 303(c) water quality authority from EPA, becoming the first tribe in California to receive such approval. The Yurok and Karuk Tribes have received Clean Water Act Section 106 grants from EPA to undertake baseline assessments, with the intent of developing water quality control plans and standards, which are expected to be completed in 2001.~~

~~In 1997, the HVTC approved and forwarded to the EPA a Water Quality Control Plan (WQCP), which included temperature objectives for protection of the anadromous fishery. The HVTC subsequently withdrew the Plan from EPA in 1999 to conduct a bi-annual review as required by the WQCP and the CWA. The HVTC is now in the process of revising its WQCP and standards to reflect the recent completion of the TRFE recommendation and other scientific findings related to heavy metals. In the event that the HVTC approves a~~

~~revised plan, it will submit it to EPA for final approval. Ultimate approval and implementation of tribal water quality control plans that include site- and time-specific temperature objectives protective of the anadromous fishery resources could provide an additional tool to provide the water quality necessary to help restore habitat and fish populations in the Trinity and Klamath Rivers.~~

4.1.14 Cumulative Impacts Analysis (CHANGES FOLLOW)
pg. 4-11

The simulation of the future cumulative condition includes consideration of:

- Projected increase in state-wide population growth and associated increase in demand for ~~CVP~~ water supplies in 2020, incorporating "probable future projects" (i.e., the No Action assumptions).
- Renewal of full contract amounts for all existing ~~All~~ CVP contractors and proposed contract amounts for new contracts provided under Section 206 of P.L. 101-514 per 3404(b) of CVPIA. ~~allocations identified in Table 4-1 are fully used (i.e., the full allocation identified for a given contract is in fact used, which as~~ These full contract amounts, shown ~~o~~in Table 4-1, ~~is~~ are in addition to what is assumed in the No Action ~~a~~Alternative~~, since such full allocation is not expected to occur by 2020)~~.
- Implementation of the CVPIA.

pgs. 4-11 and 4-12

Notably, the analysis of project impacts throughout this DEIS/EIR effectively addressed cumulative impacts by relying on models (e.g., PROSIM) that attempt to predict impacts in 2020, both of the Preferred Alternative (and other alternatives), as well as other placing demands on the CVP and SWP systems. ~~Although e~~Each chapter or subchapter of this EIS/EIR, in order to comply with CEQA, includes a section comparing the impacts of the Preferred Alternative to "existing conditions" in 1995 in order to ascertain what are commonly known as "project specific impacts," the remainder of the impact analysis compares the effects of various alternatives with "no action" (2020) conditions, which predict conditions in 2020 without the project.

pgs. 4-12 and 4-13

The following two paragraphs were one paragraph in the DEIS/EIR, but have been separated for sake of clarity.

Between 1995 and the year 2020, projected annual CVP M&I water service contracts and water rights demands are assumed to increase by approximately 320,000 af ~~north of the Delta~~. Annual SWP entitlements are projected to increase from 3.5-4.2 maf by the year 2020.

The cumulative impacts analysis includes the re-operation of the CVP in response to the ~~Trinity River DEIS/EIR~~ Preferred Alternative, and then adds the implementation of the following CVPIA measures and programs:

pg. 4-13

- Implementation of CVP re-operation and 3406(b)(2) water management for upstream and Delta actions similar to those defined in the November 20, 1997, Administrative

Paper released by Reclamation and the Service. (An additional analysis using the October 5, 1999, Decision on Implementation of Section 3406(b)(2) of the CVPIA is provided following the issue-specific cumulative impact analyses. The additional analysis was not provided in the DEIS/EIR because the DEIS/EIR was released prior to the finalization of the decision on implementation of Section 3406(b)(2).)

- Acquisition of up to 140,000 af/yr from willing sellers on the Stanislaus, Tuolumne, Merced, Calaveras, Mokelumne, and Yuba Rivers to meet instream and Delta fisheries needs. Acquired water may be exported from the Delta if conditions allow.
- Provision of firm Level 2 (typically the amount of water specific refuges received historically) refuge water supplies, including a 25 percent shortage provision in dry years based on the 40-30-30 Index (as described in the SWRCB 1995 Water Quality Control Plan).
- Acquisition of Level 4 (quantity of water specified in Interior reports assumed to allow for optimum management of each refuge specifically included in CVPIA refuge water supplies, including shortage criteria based on the reliability of the source from which the acquisition is made (Table 4-1).

~~In addition to these actions, the cumulative analysis also assumes that all CVP contracts allocations identified in Table 4-1 are fully used (i.e., the full allocation identified for a given contract is in fact used).~~

Additional analysis is presented in the FEIS/EIR to further clarify the cumulative impact assessment presented in the DEIS/EIR. The level of anticipated impact (i.e., significance) for all issue area discussions remains the same as in the DEIS/EIR.

pg. 4-25

The following new section has been added to Section 4.1.14 immediately following SWP Entitlement Water Deliveries:

Delta Surface-water Flows.

Impacts Relative to the No Action Alternative. Delta inflow is projected to decrease due to re-operation of the CVP in the cumulative condition analysis. In comparison to the No Action Alternative, average annual Delta inflow is projected to decrease by 380,000 af, or 2 percent over the period of record; 640,000 af, or 2 percent during the wet period; and 150,000 af, or 1 percent during the dry period. Average annual combined CVP and SWP Delta exports are projected to be reduced 170,000 af during the dry and wet periods, and 330,000 af, or 6 percent over the period of record. Average annual Delta outflow is projected to decrease by 40,000 af during the long-term average period; 470,000 af, or 2 percent during the wet period; and increase 60,000 af, or 1 percent during the dry period.

Impacts Relative to Existing Conditions. Delta operations are projected to change due to increased water demands and re-operation of the CVP at a 2020 level of development in the cumulative condition analysis. In comparison to the existing conditions, average annual Delta inflow is projected to decrease by 360,000 af, or 2 percent over the period of record; 600,000 af, or 2 percent during the wet period; and 170,000 af, or 1 percent during the dry period. Average annual combined CVP and SWP Delta exports are projected to be reduced

210,000 af during the dry period, but increase by 710,000 af during the wet period due to increased SWP demand south of the Delta. Combined exports increase 60,000 af, or 1 percent over the period of record. Average annual Delta outflow is projected to decrease by 450,000 af during the long-term average period; 1,350,000 af, or 6 percent during the wet period; and increase 60,000 af, or 1 percent during the dry period.

pgs. 4-25 and 4-26

Fishery Resources. Implementation of the Preferred Alternative is expected to result in a cumulatively beneficial impact in terms of increased anadromous fish production within the Trinity River Basin. As described in Chapter 3, this increase in fish production would result in beneficial recreational impacts, as well as increased economic benefits within the Trinity River Basin and Lower Klamath River Basin/Coastal Area. Modeled adverse impacts to anadromous fish within the Sacramento River would be expected to occur with regard to increased losses of early life-stages (eggs and sac-fry) of some runs of Sacramento River chinook salmon compared to the No Action Alternative, as well as existing conditions. These impacts are attributable to a slight anticipated mortality of chinook salmon eggs and sac-fry from increases of Sacramento River water temperature.~~ and would be significant~~

Trinity River Fisheries.

Impacts Relative to the No Action Alternative. Compared to the No Action Alternative, the implementation of the Preferred Alternative in relation to the cumulative condition would result in substantially restoring the diverse fish habitats necessary for the restoration and maintenance of anadromous fishery resources in the Trinity River Basin. The watershed protection component of the Preferred Alternative would accelerate and enhance habitat improvement and salmonid production through mechanical restoration. These improvements would be beneficial effects and substantially assist in the restoration of anadromous salmonid populations in the Trinity River. Increased populations would result in a greater number of fish being available for harvest.

The assumed increase in fish available for ocean commercial harvest would be a beneficial effect for the Northern/Central Oregon, KMZ-Oregon, KMZ-California, and Mendocino Regions.

Impacts Relative to Existing Conditions. Similar to the comparison to the No Action Alternative, the cumulative effects scenario would result in substantially restoring the diverse fish habitats necessary for the restoration and maintenance of anadromous fishery resources in the Trinity River Basin as compared to existing conditions. (As discussed in Section 3.5 Fishery Resources, while some habitat degradation is assumed to occur under the No Action condition, the majority of such degradation is assumed to have already occurred, and therefore, fishery habitats for existing conditions and the No Action Alternative are similar.) The watershed protection component of the Preferred Alternative would accelerate and enhance habitat improvements and salmonid production through mechanical restoration. Compared to existing conditions, these improvements would be beneficial effects and would substantially assist in the restoration of anadromous salmonid populations in the Trinity River. As discussed above, the increased availability of fish for ocean commercial harvest for the Northern/Central Oregon, KMZ-Oregon, KMZ-California, and Mendocino Regions would be a beneficial effect.

Sacramento River Fisheries.

Impacts Relative to the No Action Alternative. Implementation of the Preferred Alternative, the CVPIA Preferred Alternative, and full CVP water rights deliveries (cumulative effects) would result in modeled increased losses of early life stages (eggs and sac-fry) of some runs of Sacramento River chinook salmon compared to the No Action Alternative. These impacts are attributable to mortality of chinook salmon eggs and sac-fry from increases of upper Sacramento River water temperature. On an annual average basis, losses of fall and spring chinook salmon would increase approximately 1 percent over the No Action Alternative. These increases in mortality occurred throughout the simulation period of 1922-1990 due to increased water temperatures in the upper Sacramento River. Losses of late-fall chinook and steelhead would likely remain unchanged from No Action. Per NMFS' BO (2000), implementation of the Preferred Alternative is not likely to jeopardize Central Valley spring-run chinook salmon given implementation of reasonable and prudent measures specified in the BO.

Losses of winter chinook salmon eggs and fry would increase approximately 6 percent beyond that estimated for No Action. The modeled increases in mortality occurred during the critically dry waters years of 1924, 1931 through 1935, and 1977. For those years, increased water temperatures resulted in very large mortality increases (up to nearly 70 percent greater than those for No Action) of incubating and developing sac-fry. For the entire simulated period (1922-1990), the losses are slightly greater than assumed for the No Action condition, but they would be significant.

The cumulative effects of the implementation of preferred alternatives and full CVP deliveries on Delta species would likely be minor compared to No Action. The average absolute change in the position of X2 (in km) in the Delta during February through June would be less than 1.7 km, a relative change of less than 3 percent. These changes in geographic position of X2 may not be sufficiently large as to affect transport of larvae and juveniles into areas in the Delta where they could be entrained into the Delta pumps. However, reductions in outflows greater than 10 percent less than the No Action Alternative during the months of February through June occurred in up to 14 percent of the years modeled. These reductions may result in adverse effects to Delta smelt and other native or important sport fish in the Delta, and would be considered a significant impact. ~~in the Delta in comparison to the No-Action, and existing conditions scenario may adversely affect Delta species by relocating them in less productive or areas of lower habitat value within the Delta. These changes would be considered significant.~~

Impacts Relative to Existing Conditions. Implementation of the Preferred Alternative, the CVPIA Preferred Alternative, and full CVP water rights deliveries (cumulative effects) would result in even greater losses of early life stages (eggs and sac-fry) of fall, winter, and spring chinook salmon compared to existing conditions. This would result from increased water temperatures in the upper Sacramento River. Losses of late-fall chinook and steelhead would likely remain unchanged from No Action. On an annual average basis, losses of fall, winter, and spring chinook salmon would increase approximately 2, 6, and 4 percent, respectively, over those under existing conditions. These losses would be significant.

The cumulative effects of the implementation of the Preferred Alternative and full CVP deliveries on Delta species would also be minor compared to No Action. The average absolute change in the position of X2 (in km) in the Delta during February through June would be less than 1.6 km, a relative change of approximately 2 percent. These changes are likely not sufficient in magnitude to result in adverse effects to Delta smelt and other native or important sport fish in the Delta. The changes in the positions of X2 would not be large enough to transport larvae and juvenile smelt and other species into areas where they would be subject to increased entrainment or less suitable habitats. Reductions in outflows in the Delta during the months of February through June may result in adverse impacts to Delta species. These impacts are considered potentially significant.

pg. 4-26

The following new section has been added to Section 4.1.14 immediately before Agricultural Land Use:

M&I Land Use. Surface-water deliveries to municipal water service contractors north and south of the Delta could be influenced by future demands for water as well as CVP and SWP operational limitations in meeting other needs.

Impacts Relative to the No Action Alternative. Average M&I surface-water delivery is estimated to decrease by 6,800 af in the Sacramento Valley Region. Groundwater, other local supplies, and a small amount of price-induced conservation are projected to be used to eliminate this shortfall at a cost of $1.1 to $1.9 million annually. The average retail price increase needed to cover these costs would not be significant. In the dry condition, CVP contract deliveries would be reduced by 15,800 af compared to the No Action Alternative. Some of the resulting shortage is projected to be eliminated using yield from water supplies acquired for the average condition. It is assumed that drought conservation would be used to manage the remaining shortage. The costs of drought conservation would increase about $3.6 million annually compared to the No Action Alternative[20].

In the Bay Area, average M&I surface-water delivery is estimated to decrease by 17,200 af. Conservation, reclamation, and a small amount of price-induced conservation (i.e., conservation resulting from an increase in the retail price) are assumed to be used to eliminate this shortfall at a cost of $2.7 to $4.5 million annually. The average retail price increase needed to cover these costs would not be significant. In the dry condition, CVP contract deliveries would be reduced by 41,100 af compared to the No Action Alternative. Some of the resulting shortage would be eliminated using yield from water supplies acquired for the average condition. It is assumed that drought water supplies would be acquired to eliminate the remaining shortage. The costs of these dry-condition supplies would increase about $44 to $76 million annually compared to the No Action Alternative.

In the San Joaquin Valley, average M&I surface-water delivery is estimated to decrease by 2,100 af. Groundwater, other local supplies, and a small amount of price-induced conservation are assumed to be used to eliminate this shortfall at a cost of $0.3 to $0.7 million annually. The average retail price increase needed to cover these costs would not be significant. In the dry condition, CVP contract deliveries are projected to be reduced by

[20] Dry-condition costs are in addition to the average-condition costs and occur only in dry years (1928 through 1934, or about once every 5 years on average).

2,900 af compared to the No Action Alternative. Some of the resulting shortage would be eliminated using yield from water supplies acquired for the average condition. It is assumed that drought conservation would be used to manage the remaining shortage. The costs of drought conservation would increase about $0.2 million annually compared to the No Action Alternative.

Impacts Relative to Existing Conditions. Average surface-water delivery for municipal use is estimated to increase by 18,600 af in the Sacramento Valley Region. Average-condition shortfall is projected to increase from zero to 10,100 af. The shortfall occurs because the increase in surface-water delivery is not enough to meet increased demand in 2020 in affected service areas. Groundwater, other local supplies, and a small amount of price-induced conservation is assumed to be used to eliminate this shortfall at a cost of $1.7 to $2.7 million annually. The average retail price increase needed to cover these costs would be more than 1 percent on average, which is significant. However, as evidenced above in the comparison of the cumulative condition to No Action, the majority of gap between supply and demand is associated with assumed increased population growth. In the dry condition, CVP contract deliveries would be increased by 2,200 af compared to existing conditions, but shortage would increase by 11,900 af. Some of the resulting shortage would be eliminated using yield from water supplies acquired for the average condition. It is assumed that drought conservation would be used to manage the remaining shortage. The costs of drought conservation would increase about $0.8 million annually compared to existing conditions.

In the Bay Area, average surface-water delivery is estimated to increase by 5,200 af. Average-condition shortfall is projected to increase from zero to 8,400 af. The shortfall is projected to occur because the increase in surface-water delivery is not enough to meet 2020 demand in affected service areas. Conservation, reclamation, and a small amount of price-induced conservation would be used to eliminate this shortfall at a cost of $3.9 to $6.5 million annually. The average retail price increase needed to cover these costs would not be significant. In the dry condition, CVP contract deliveries are projected to be reduced by 36,100 af compared to existing conditions. Some of the resulting shortage is assumed to be eliminated using the water acquired for the average condition. It is assumed that drought water supplies would be acquired to eliminate the remaining shortage. The cost of dry-condition supplies would increase about $78 to $198 million annually compared to existing conditions.

In the San Joaquin Valley, average surface-water delivery is estimated to increase by 900 af. Average-condition shortfall is projected to increase from zero to 2,400 af. The shortfall is projected to occur because the increase in surface-water delivery is not enough to meet 2020 demand in affected service areas. Groundwater, other local supplies, and a small amount of price-induced conservation are assumed to be used to eliminate this shortfall at a cost of $0.4 to $0.8 million annually. The average retail price increase needed to cover these costs would not be significant. In the dry condition, CVP contract deliveries are projected to be increased by 100 af compared to existing conditions. Some of the resulting shortage is assumed to be eliminated using water acquired for the average condition. It is assumed that drought conservation would be used to manage the remaining shortage. The costs of drought conservation would increase about $0.8 million annually compared to the existing conditions.

Impacts Relative to the No Action Alternative.

pg. 4-29

Additional land retirement is expected to be implemented in SWP service areas within Kings and Kern Counties. In areas not implementing land retirement, changes in surface-water supply are assumed to be largely matched by regional changes in groundwater pumping. Irrigated acreage reductions would be more pronounced in areas with limited usable groundwater. In the San Felipe Unit, irrigated acres would decline by approximately 9,000, with an average gross revenue reduction of about $32 million per year. This reduction in irrigated acreage represents a significant decrease of almost 38 percent within the subregion and would result in a substantial impact on the agricultural economy of the San Felipe Unit.

pg. 4-31

~~**Water Quality.** As described in Section 3.4, Water Quality, Trinity River instream temperatures associated with Lewiston releases are identified as improving compared to the No Action and Existing Conditions scenarios. This is in part due to shifting exports to the summer and fall months decrease the potential for warming of water within Lewiston. Under the cumulative scenario, Trinity Reservoir temperatures are assumed to degrade below No Action levels, primarily in normal and dry conditions as a result of greater future CVP demands driving the need to decrease Trinity Reservoir carryover storage. This would be a significant impact with regard to Trinity River temperatures.~~

~~Modeled water temperature impacts within the Sacramento River are modeled to be slightly greater than what is anticipated for the Preferred Alternative. Associated temperature-related impacts to fisheries are discussed previously under Fishery Resources.~~

Trinity River Temperature. The cumulative impacts analysis presents the results of Trinity Division temperature model simulations under two versions of the cumulative condition: one that maintains a minimum carryover storage level of 600 taf in Trinity Reservoir ("cumulative (600 taf)"), and a second that maintains carryover storage of 400 taf ("cumulative (400 taf)"). To evaluate compliance with NCRWQCB standards, results of the SNTEMP model are presented as percentage of days that instream temperatures violate Trinity River temperature objectives under median year hydro-meteorological conditions (see Table 3-8 of Section 3.4). The median-year evaluation criteria were developed by the Service for use with the SNTEMP model for the period July 1 through October 15, as presented in Table 3-7. For each alternative, simulations were performed for five specific years (1983, 1986, 1989, 1990, and 1977) representing five different water-year classes (extremely wet, wet, normal, dry, and critically dry), as outlined in Section 3.4 Water Quality. Evaluation of the Hoopa EPA temperature criteria relied upon actual hydro-meteorological conditions of the representative years modeled using BETTER. These years included 1977 (critically dry), 1990 (dry), 1989 (normal), 1986 (wet), and 1983 (extremely wet). This evaluation provided estimates of the percentage of weeks the objectives would be met, as outlined in Section 3.4 Water Quality.

Impacts Relative to the No Action Alternative. In four of the five years analyzed, the cumulative (600 taf) either had the same NCRWQCB compliance as No Action or improved compliance. In the normal water year, cumulative (600 taf) decreased compliance by

6.5 percent (105 days of temperature compliance versus 98 days under cumulative (600 taf)). In the extremely wet and wet water years, cumulative (600 taf) achieves the same compliance as No Action (100 percent compliance). In the dry and critically dry water years, cumulative (600 taf) has 12.1 percent and 68.2 percent better compliance than No Action, respectively (94 days of compliance versus 81 days for dry; 97 days versus 24 days for critically dry). For the Hoopa EPA standards, cumulative (600 taf) improved compliance in four of the five years analyzed. In the extremely wet water year, compliance was the same as the No Action Alternative (100 percent).

In three of the five years analyzed, the cumulative (400 taf) either had the same compliance as No Action or improved compliance. In the normal and dry water years, cumulative (400 taf) decreased compliance by 27.1 percent and 16.8 percent, respectively (105 days of temperature compliance versus 76 days under cumulative (400 taf) for the normal water year; 81 days versus 63 days for the dry water year). In the extremely wet and wet water years, cumulative (400 taf) achieves the same compliance as No Action (100 percent compliance). In the critically dry water year, cumulative (400 taf) has 6.5 percent better compliance than No Action (31 days versus 24 days). For the Hoopa EPA standards, cumulative (400 taf) improved compliance in three of the five years analyzed. In the critically dry and extremely wet water year, compliance was the same as the No Action Alternative (88 percent and 100 percent, respectively.

Reasons for the differences in compliance with temperature objectives between these alternatives are due to the changes in the timing and rate of CVP diversions; cooler water temperatures in Lewiston Reservoir typically result from higher CVP diversion rates (i.e., high flow through Lewiston Reservoir). Historically, temperatures in Lewiston Reservoir have been highly variable because of intermittent operation of the Carr Powerplant. When operating at full capacity, the plant draws about 3,200 cfs through the intake. This rate of flow through Lewiston Reservoir is sufficient to displace its entire volume in only 2.5 days. During summer, high through-flow prevents the formation of a warm surface layer and results in fairly uniform water temperature, usually around 47°F. When the Carr Powerplant is not operating, thermal stratification develops within a few days, and surface summer temperatures can warm to between 60°F and 70°F. Dry-year class operations that divert most of the water to the CVP during the spring months also tend to drain Trinity Reservoir by early summer. The resultant low summer storage in Trinity Reservoir may allow the reservoir's thermocline to intersect the dam outlet intake structure. This adverse effect of low summer storage in Trinity Reservoir can be seen as a drop in compliance with downstream temperature objectives when the Preferred Alternative is operated at a lower minimum reservoir storage (400 taf versus 600 taf). Both cumulative scenarios improve compliance with the Hoopa EPA standards compared to No Action. This is largely a result of the higher instream flows assumed under both cumulative scenarios.

Impacts Relative to Existing Conditions. In three of the five years analyzed, the cumulative (600 taf) either had the same compliance as existing conditions or improved compliance. In the normal and dry water years, cumulative (600 taf) decreased compliance by 5.6 percent and 12.1 percent, respectively (104 days of temperature compliance versus 98 days under cumulative (600 taf) for the normal water year; 107 days versus 94 days for the dry water year). In the extremely wet and wet water years, cumulative (600 taf) achieves the same compliance as existing conditions (100 percent compliance). In the critically dry water year,

cumulative (600 taf) has 74.8 percent better compliance than existing conditions (17 days versus 97 days). For the Hoopa EPA standards, cumulative (600 taf) improved compliance in four of the five years analyzed. In the extremely wet water year, compliance was the same as existing conditions (100 percent).

In three of the five years analyzed, the cumulative (400 taf) either had the same compliance as existing conditions or improved compliance. In the normal and dry water years, cumulative (400 taf) decreased compliance by 26.2 percent and 41.1 percent (104 days of temperature compliance versus 76 days under cumulative (400 taf) for the normal water year; 107 days versus 63 days for the dry water year). In the extremely wet and wet water years, cumulative (400 taf) achieves the same compliance as existing conditions (100 percent compliance). In the critically dry water year, cumulative (400 taf) has 13.1 percent better compliance than existing conditions (17 days versus 31 days). For the Hoopa EPA standards, cumulative (400 taf) improved compliance in three of the five years analyzed. In the critically dry and extremely wet water year, compliance was the same as existing conditions (88 percent and 100 percent, respectively).

Reasons for the differences in compliance with temperature objectives between these alternatives are the same as those listed for the comparison with No Action.

Sacramento River Temperature. The following analysis is based on temperature criteria established in the Sacramento River Biological Opinion (1993) for the protection of Sacramento River winter chinook salmon and described in Section 3.4 Water Quality.

Impacts Relative to the No Action Alternative. Model results for the cumulative condition indicated that on average, overall temperature violations from April through October would increase approximately 4 percent from 15.9 percent to 19.9 percent. For individual months, the largest increases in violations over those that were projected to occur under the No Action Alternative occurred during the months of May through June, with violations increasing up to 10 percent (June). Conversely, the model indicates that the Cumulative Impacts scenario would result in 6 percent fewer violations during April when compared to No Action Alternative.

Modeling based on dry-period data revealed, on average, that the number of temperature violations from April through October under the Cumulative Impacts scenario increased approximately 5 percent when compared to the No Action Alternative. During the dry period, approximately 39 percent and 45 percent of the months from April through October would result in violations of the Biological Opinion temperature criteria for No Action and Cumulative Impacts, respectively. Generally, the magnitude of temperature violations is greater under the cumulative condition than under No Action. This is reflected in increased winter-run mortality in dry years. Please see Sacramento River Fisheries for a discussion of cumulative effects on salmon mortality.

Cumulative Impacts during the wet period resulted in a decrease in the number of temperature violations during the months of April through October when compared to the No Action Alternative. For the No Action Alternative, Biological Opinion temperature criteria violations would occur on average, in approximately 20 percent of the months from April through October. This is compared to violations occurring in approximately 9 percent of the months from April through October for the Cumulative Impacts scenario.

Impacts Relative to Existing Conditions. Modeling of long-term temperature data indicated that the Cumulative Impacts scenario would result in an approximate 6 percent increase in the number of months when the Sacramento River Biological Opinion temperature criteria for winter chinook salmon would be violated when compared to existing conditions. Overall, the percentage of months from April through October with temperature violations would increase from approximately 14 percent to 20 percent. The largest increases in violations under the Cumulative Impacts scenario would occur during the months of May through September and would increase up to approximately 12 percent more violations (July) than the No Action Alternative. Conversely, in April there would be approximately 6-percent fewer violations than that for the No Action Alternative.

For the dry period, on the average and compared to existing conditions, the number of temperature violations during the months of April through October was projected to increase approximately 8 percent for the Cumulative Impacts scenario. For existing conditions, during the dry period, approximately 37 percent of the months from April through October would result in violations of the Biological Opinion temperature criteria. For the Cumulative Impacts scenario, this would increase to approximately 45 percent. For individual months, the greatest increase in the number of monthly temperature violations would occur in April (approximately 29 percent), and the largest decrease in the number of monthly temperature violations would occur in October (approximately 29 percent). Generally, the magnitude of temperature violations is greater under the cumulative condition than under existing conditions. This is reflected in increased winter-run mortality in dry years. Please see Sacramento River Fisheries for a discussion of cumulative effects on salmon mortality.

For the wet period, on the average and compared to existing conditions, the number of temperature violations during the months of April through October were approximately 11 percent fewer for the Cumulative Impacts scenario. For existing conditions, approximately 20 percent of the months from April through October would result in violations of the Biological Opinion temperature criteria. This is compared to approximately 9 percent of the months from April through October for the Cumulative Impacts scenario which would violate the Biological Opinion temperature criteria. For individual months, the greatest decrease in the number of monthly temperature violations would occur during June through September (approximately 20 percent), and there were no months when there were more monthly temperature violations than that for the existing conditions scenario.

Bay-Delta Drinking Water Quality.

Impacts Relative to the No Action Alternative. The DSM2 Delta water quality results projected varying increases and decreases in average monthly EC, bromide, and DOC concentrations throughout the year at Contra Costa Canal Intake, Old River at Highway 4, Delta-Mendota Canal Intake, and Clifton Court Forebay.

The greatest potential for increase is at Old River near Highway 4, where EC and bromide concentrations are estimated to increase up to 50 and 80 percent in December and January due to closures of the Cross Channel Gate as part of the Delta 3406(b)(2) actions assumed to be implemented under CVPIA. Impacts of this magnitude would not be expected to occur in actual operations since the Cross Channel Gate would be re-opened if monitored EC concentrations approach threshold levels as defined in the 1997 CALFED Operations Group

Sacramento River Spring-Run Chinook Salmon Protection Plan. The decision to re-open the gates would be made on a real-time basis.

Modeled EC and bromide concentrations at the Delta-Mendota Canal Intake were projected to increase up to 24 percent under average and critical dry conditions in the high export months of June and July. DOC concentrations at the Contra Costa Canal Intake, Old River at Highway 4, Delta-Mendota Canal Intake, and Clifton Court Forebay rise up to 16 percent under average conditions and 12 percent in critical dry years in the months of April through July, due to reduced CVP and SWP exports. Greens Landing and North Bay Aqueduct concentrations are similar to the No Action Alternative for the three constituents. These potential changes in Delta water quality would be significant impacts.

Impacts Relative to the Existing Conditions. As is the case for the No Action comparison, the DSM2 Delta water quality results show varying increases and decreases in average monthly EC, bromide, and DOC concentrations throughout the year at Contra Costa Canal Intake, Old River at Highway 4, Delta Mendota Canal Intake, and Clifton Court Forebay.

Modeled EC and bromide concentrations at Old River near Highway 4 are projected to increase up to 60 and 100 percent in December and January due to closures of the Cross Channel Gate as part of the Delta 3406(b)(2) actions implemented under CVPIA. As with the No Action analysis, impacts of this magnitude would not be expected to occur in actual operations since the Cross Channel Gate would be re-opened if monitored EC concentrations approach threshold levels as defined in the 1997 CALFED Operations Group Sacramento River Spring-Run Chinook Salmon Protection Plan.

EC and bromide concentrations at the Delta-Mendota Canal Intake increase up to 35 and 25 percent under average and critical dry conditions in the high export months of June and July. DOC concentrations at the Contra Costa Canal Intake, Old River at Highway 4, Delta-Mendota Canal Intake, and Clifton Court Forebay rise up to 10 percent under average conditions and 13 percent in critical dry years in the months of April through July, due to reduced CVP and SWP exports. Greens Landing and North Bay Aqueduct concentrations are similar to the No Action Alternative for the three constituents. These potential changes in Delta water quality would be significant impacts.

Power Resources. As described in Section 3.10, Power Resources, and above under Section 4.1.3, the Preferred Alternative would reduce available CVP hydropower generation annually and in peak power demand periods (i.e., summer months). If this power is not available for use by Western preference power customers, the customers or Western would need to purchase power from other sources. ~~Therefore, the cost of power for all users would probably increase due to market forces. Significant cumulative impacts (primarily air quality impacts) could occur if these reductions in power supplies induced increased generation from either existing gas-fired generators or the construction of new facilities. Such impacts are anticipated to be further exacerbated under the cumulative condition. The overall cumulative impact from the Preferred Alternative and probable future projects is therefore considered potentially significant. In addition, the Preferred Alternative's incremental contribution to this condition is considered to be cumulatively considerable.~~

Two important changes to water operations occur under the cumulative condition, both of which affect the value of power resources. First, the minimum carryover storage at Trinity

Reservoir is reduced from 600 taf to 400 taf, which has a direct effect on the capacity provided by the Trinity Powerplant, reducing its value as a peaking resource. Although the reduction in carryover storage only occurs in the worst-case scenario, for the purposes of power valuation, this reduction in firm capacity would be substantial. Generally, the cumulative run reduced reservoir levels across the CVP, with corresponding reductions in capacity. However, the reduction at Trinity was especially notable in terms of impacts to CVP preference customers because the reduced capacity occurred specifically in dry years, when capacity is especially valuable. Secondly, exports were shifted back towards the spring months under the cumulative scenario in order to alleviate temperature concerns in the Sacramento River. This shift reduces the value of TRD generation by moving it from the higher-value summer months to the lower-value spring months. These changes are important to consider in relation to the Preferred Alternative, where a reduction in generation was offset by an increase of value. For the cumulative condition, a decrease in generation (compared to No Action) is compounded by a reduction in value.

Impacts Relative to the No Action Alternative. Compared to the No Action Alternative, energy production is reduced in the cumulative condition by approximately 8 percent. This decrease reduces the value of energy compared to No Action because generation under the cumulative condition occurs less often in the higher-value summer season. The majority of the generation under the cumulative condition occurs in the lower-value spring season. Average monthly capacity is reduced by approximately 3 percent. However, reductions in firm capacity (capacity supported by energy) account for a substantial decrease in value. These two factors; shift in timing of generation, and reduction in dry year firm capacity, account for the majority of the reduction in value under the cumulative condition compared to the No Action condition. The cumulative condition would reduce the value of CVP power resources by $9,975,000 per year compared to the No Action Alternative. The reduction in value is considered significant.

Impacts Relative to Existing Conditions. The characteristics of Power Resources under existing conditions are similar to those under the No Action Alternative. However, under existing conditions electrical power and energy are jointly managed with PG&E as per Contract 2948-A. The No Action Alternative assumes that this contract is not renewed. While this assumption does not have a major effect on the value of electricity generated, under No Action, electricity generation better matches preference power customer loads. Similar to the comparison to No Action, the reduction in value under the cumulative condition compared to existing condition is considered significant.

pg. 4-32

The following new section has been added to Section 4.1.14 immediately following Mitigation (new Table 4-3A and Figures 4-6 and 4-7 are included in Section 2.3 Changes to the DEIS/EIR Tables and Figures):

Reclamation Analysis of Preferred Alternative and October 5, 1999, Decision on Implementation of 3406(b)(2). Subsequent to the cumulative impact analysis conducted for the DEIS/EIS, Reclamation conducted a PROSIM analysis of the impacts of regulatory actions on CVP and SWP water supplies related to the Preferred Alternative and DOI's interpretation of 3406(b)2 water management as defined in the October 5, 1999, Decision on Implementation of Section 3406(b)(2) of the CVPIA. The study was conducted at a 1995

level of development using the hydrologic period from 1983 through 1993. Hydrologic conditions during this 11-year period range from critically dry to wet.

PROSIM simulations were conducted for four conditions representing increasing levels of regulatory actions. The four simulations included a pre-CVPIA 1995 water quality control plan (Bay-Delta WQCP), 3406(b)(2), and Preferred Alternative conditions. The conditions are additive, in that the 3406(b)(2) condition includes the Bay-Delta WQCP condition, and the Preferred Alternative includes both the Bay-Delta WQCP and 3406(b)(2) conditions. The Bay-Delta WQCP simulation represents conditions that are generally similar to the DEIS/EIR existing conditions. The Preferred Alternative simulation represents conditions that are generally similar to the cumulative impact analysis. The specific assumptions associated with each of the simulations are summarized in Table 4-3A.

The model results for the Preferred Alternative show an average annual allocation of 45 percent of full allocation for north of Delta CVP agricultural and 76 percent for northern M&I water service contractors, compared to 60 percent and 84 percent for the Bay-Delta WQCP condition, respectively. The majority of the decrease in allocations for the agricultural water service contractors is related to the implementation of 3406(b)(2). South of the Delta, agricultural water service contractor average annual allocations would be 36 percent compared to 63 percent for the Bay-Delta WQCP condition, and 74 percent compared to 86 percent for the M&I contractors. Again, the majority of the incremental decrease in allocations between the Bay-Delta WQCP and Preferred Alternative is related to the implementation of Section 3406(b)(2). SWP deliveries south of the Delta were the same between the Preferred Alternative and Bay-Delta WQCP simulations. Figures 4-6 and 4-7 show the comparison of average annual deliveries north and south of the Delta. As also shown on Figures 4-6 and 4-7, CVP deliveries to Sacramento River Settlement Contractors, San Joaquin River Exchange Contractors, and refuges are not affected by b(2) water management or the Preferred Alternative.

Although these results differ from the analyses conducted for the DEIS/EIR (due to differences in level of development and hydrologic period), they are consistent in that both sets of results show substantial reductions in CVP deliveries south of the Delta due to reduced available water supply and b(2) water management export restrictions.

4.2 Growth-inducing Impacts *(NO CHANGE)*

4.3 Irreversible and Irretrievable Commitments of Resources and Significant Impacts that Would Remain Unavoidable Even after Mitigation *(NO CHANGE)*

4.4 Short-term Uses of the Environment Versus Long-term Productivity *(NO CHANGE)*

4.5 Environmental Commitments and Mitigation and Significant Unavoidable Impacts **(CHANGES FOLLOW)**

pg. 4-38

Table 4-4 has been revised to include Hoopa Valley Tribe temperature objectives and mitigation. See Section 2.3 Changes to the DEIS/EIR Tables and Figures for revised Figure 4-4.

5.0 Consultation and Coordination *(SEE SUBSECTIONS)*

5.1 Lead and Participating Agencies *(SEE SUBSECTIONS)*

5.1.1 Applicable Laws, Policies, and Programs **(CHANGES FOLLOW)**

pgs. 5-4 and 5-5

California Environmental Quality Act. This document was prepared to comply with CEQA, based on the Trinity County's determination that the proposed action constitutes a "project" under CEQA (CEQA Guidelines Section 15378[a]). CEQA and NEPA are similar in many ways in terms of the identification of alternatives, potential mitigation measures, and adverse environmental impacts that cannot be avoided (see Chapter 1). This joint NEPA/CEQA document is meant to comply with both laws so as to reduce redundancy while providing the necessary documentation for both processes. Key among the CEQA provisions is the requirement to identify all significant impacts. Significance thresholds are identified for each issue area to allow the reader to clearly see at what point a given environmental impact was considered significant. For more information on CEQA, see Chapter 1 ~~and Technical Appendix G~~.

pgs. 5-5 and 5-6

Fish and Wildlife Coordination Act. The FWCA requires consultation with the Service and the fish and wildlife agencies of states when any water body is impounded, diverted, controlled, or modified for any purpose by any agency under a federal permit or license. The Service and state agencies charged with managing fish and wildlife resources are to conduct surveys and investigations to determine the potential damage to fish and wildlife and the mitigation measure to be taken. The Service may incorporate the concerns and findings of state agencies and other federal agencies. ~~Compliance with the FWCA will be coordinated with consultation for ESA, as described above.~~ By virtue of joint administration of the NEPA/CEQA process and joint development of the DEIS/EIR and FEIS/EIR, the federal and state consultation requirements of this act have been satisfied.

pg. 5-6

National Historic Preservation Act. Section 106 of the NHPA requires that federal agencies evaluate the effects of federal undertakings on historical, archeological, and cultural resources and afford the Advisory Council on Historic Preservation (ACHP) the opportunity to comment on the proposed undertaking. The first step in the process is to identify cultural resources included on (or eligible for inclusion on) the NRHP that are located in or near the project area. The second step is to identify the possible effects of proposed actions. The lead agency must examine whether feasible alternatives exist that would avoid such effects. The lead agencies have consulted under Section 106 of the National Historic Preservation Act with the appropriate tribes, Tribal Historic Preservation Office, and State Historic Preservation Office. Section 106 compliance in the form of a Programmatic Agreement will be executed prior to the execution of the ROD. Procedures and conditions contained in the Programmatic Agreement also satisfy the archaeological resources protection provisions of the Antiquities Act of 1906, the Reservoir Salvage Act of 1960, the Archaeological and Historic Preservation Act of 1974, and the Archaeological Resources Protection Act of 1979. ~~Compliance with the NHPA is discussed in Section 3.12.~~

pgs. 5-7 and 5-8

Wild and Scenic Rivers Act. The Wild and Scenic Rivers Act designates qualifying free-flowing river segments as wild, scenic, or recreational. The act establishes requirements applicable to water resource projects affecting wild, scenic, or recreational rivers within the National Wild and Scenic Rivers System, as well as rivers designated on the National Rivers Inventory. The Trinity River was designated a Wild and Scenic River due in part to its "outstandingly remarkable resource," the fishery (46 FR 7484). Implementation of the Preferred Alternative must be demonstrated to be consistent with this Act, under which it is the "policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. Therefore, ~~U~~under the act, a federal agency may not assist the construction of a water resources project that would have a direct and adverse effect on the free-flowing, scenic, and natural values of a wild or scenic river. If the project would affect the free-flowing characteristics of a designated river or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the area, such activities should be undertaken in a manner that would minimize adverse impacts, and should be developed in consultation with the NPS. ~~The Trinity River was designated a Wild and Scenic River due in part to its "outstandingly remarkable resource," the fishery (P.L. 90-542).~~ Impacts to the Trinity River are discussed in light of the designation and the Act. Final determinations of consistency must be made by those federal agencies responsible (NPS, BLM, and USFS) for the management of various segments of the Trinity River within the National Wild and Scenic River system. Wild and Scenic Rivers Act compliance will be documented prior to execution of the ROD.

pg. 5-8

The following new text has been added to the end of Section 5.1.1:

Clean Air Act (42 U.S.C. 7401) and Amendments of 1977. The majority of the amendments to the Clean Air Act were enacted in 1977 and are known as the Clean Air Amendments of 1977 (P.L. 95-95; 91 Stat. 685). The primary objective of the Clean Air Act is to establish federal standards for various pollutants from both stationary and mobile sources, and to provide for the regulation of polluting emissions via state implementation plans. In addition, the amendments are designed to prevent significant deterioration in certain areas where air quality exceeds national standards, and to provide for improved air quality in areas that do not meet federal standards ("nonattainment" areas). The Trinity River Basin lies within the North Coast Air Basin (NCAB), which is under the jurisdiction of the North Coast Unified Air Quality Management District (NCUAQMD). The air quality of the Trinity River Basin meets the national Ambient Air Quality Standards (AAQS) for all criteria pollutants. However, it is designated non-atttainment by the state with respect to PM_{10} in the Weaverville area during winter months, due to residential wood heating.

Site-specific environmental reviews would be conducted for all non-flow activities, e.g., channel rehabilitation projects, watershed protection projects, and spawning gravel placement. However, air quality impacts resulting from implementation of any of the

alternatives would be de minimus (see Mitigation on page 3-424 of the DEIS/EIR) and thus consistent with this Act.

Coastal Zone Management Act of 1972, as amended (16 U.S.C 1451-1464, chapter 33; P.L. 92-583). Coastal Zone Management Act of 1972, as amended, established a voluntary national program within the Department of Commerce to encourage coastal states to develop and implement coastal zone management plans. Consistent with the provisions of this act, the State of California's coastal plan has defined boundaries of the coastal zone, identified uses of the area to be regulated by the state, the mechanism (criteria, standards, or regulations) for controlling such uses, and broad guidelines for priorities of uses within the coastal zone. None of the alternatives would result in changes in land use within the Coastal Zone; thus, the proposed action is consistent with this act.

Farmland Protection Policy Act of 1981 (7 U.S.C. 420). The Farmland Protection Act requires identification of proposed actions that would affect any lands classified as prime and unique farmlands. The U.S. Natural Resources Conservation Service (formerly Soil Conservation Service) administers this act to preserve farmland. Consistent with this act, the lead agencies have identified actions that may affect agricultural lands in the DEIS/EIR and FEIS/EIR.

Federal Water Pollution Control Act (Clean Water Act) (33 U.S.C. 1251 et seq.)(Section 404 and Section 401 Water Quality Certification programs). Section 404 authorizes the Corps to issue permits for the discharge of dredged or fill material into navigable waters at specified disposal sites (33 U.S.C. 1344). EPA is authorized to prohibit the use of a site as a disposal site based on a determination that discharges would have an unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas, wildlife, or recreational uses. Applicants for federal permits or licenses for activities involving discharges into navigable waters are to provide a state certification that the proposed activity would not violate applicable water quality standards (33 U.S.C. 1341). Licenses and permits may not be granted if the state or interstate certification has been denied. Permits under Sections 401 and 404 are not required prior to the Secretary making a decision; however, permits would be required under Sections 401 and 404 if mechanical restoration projects were part of the program adopted under the Secretary's decision (actual implementation of the project would undergo a site-specific environmental review).

Federal Water Project Recreation Act (P.L. 89-72). This act recognizes recreation as a purpose in water development projects and states that federal agencies must consider potential outdoor recreational opportunities and potential fish and wildlife enhancement when planning navigation, flood control, reclamation, hydroelectric, or multi-purpose water resource projects. While the proposed project is not intended to develop new water, the Preferred Alternative would result in a modification of a Reclamation project that incorporates a substantial recreation component. As described in this DEIS/EIR, implementation of the Preferred Alternative would not adversely affect recreational activities on the river or at reservoirs.

Noise Control Act of 1972; Noise Pollution Abatement Act of 1970 (P.L. 91-604). It is not anticipated that project implementation would result in excessive noise because very few sensitive receptors are located within the project area. However, consistent with these acts, the lead agencies would comply with any state, interstate, and local requirements respecting

control and abatement of environmental noise to the same extent that any person is subject to such requirements.

Porter-Cologne Water Quality Control Act. Together, the federal Clean Water Act (33 U.S.C. § 1251 et. seq.) (CWA) and the state Porter-Cologne Water Quality Control Act (Wat. Code, § 13000 et seq.) (Porter-Cologne) regulate water quality in California's water bodies, including the Trinity River, the Sacramento River, and the Sacramento-San Joaquin Delta. The CWA sets a broad legal framework for protecting water quality throughout the nation, but gives states the opportunity to operate their own regulatory programs, provided that the resulting water quality control is sufficiently stringent to meet or exceed federal criteria. The Porter-Cologne Act and its programs serve this function within California. Porter-Cologne requires each of the state's nine Regional Water Quality Control Boards to adopt "basin plans" for areas within the affected region. (Wat. Code, § 13240.) These plans contain "water quality objectives" that, when approved by SWRCB and EPA, function as "water quality standards" under the CWA. Although water quality objectives typically regulate ambient waters and most frequently focus on traditional pollutants such as heavy metals, they also regulate permissible saline levels and turbidity, and set water temperatures needed to protect fisheries and other aquatic resources. In both the Trinity and Sacramento Rivers, the maintenance of temperature objectives is very important to the protection of fisheries.

To achieve and maintain water quality objectives, regional boards issue "waste discharge requirements" (WDRs) limiting pollutants levels in discharges to water bodies (Wat. Code, § 13260 et seq.). These WDRs are the equivalent of, and function as, National Pollutant Discharge Elimination System (NPDES) permits required by the CWA.

Compliance with the Porter-Cologne Water Quality Control Act and all applicable permits are discussed in Section 3.4 Water Quality.

Caltrans Encroachment Permits. California Streets and Highway Code Sections 670 through 675 authorize the California Department of Transportation (Caltrans) to issue permits allowing various kinds of alterations to state highways. Among the possible alterations are the making of openings or excavations, or the placing, changing, or renewing of "encroachment[s]." Through the issuance of such permits, Caltrans can allow the owner or developer of property adjacent to a highway to construct, alter, repair, or improve any portion of the highway for the purpose of improving local traffic access. In granting such permits, Caltrans has authority to require a permitee to fund the costs of the necessary improvements, and to ensure that the work at issue will not leave the highway worse off from either a physical or a safety standpoint. It is possible that channel restoration projects envisioned under various alternatives would create the need to obtain new points access to State Highways 3 or 299.

Trinity County Encroachment Permits. Section 12.04.010 of the Trinity County Code authorizes the Trinity County Transportation Department to require encroachment permits for new points of access to county roads or other activities that might damage the surface of county roads. Section 12.04.020 of the County Code allows the County to require as a permit condition that the county road be left in as good condition as it was before any change was made. Section 12.04.030 of the County Code allows the permit to be conditioned to require a bond or cash deposit to ensure that the permit conditions are met.

Watershed restoration projects associated with county roads would undergo environmental review through the Trinity or Humboldt County Planning Departments and may require encroachment permits if an entity other than the Counties (Resource Conservation District, etc.) would be performing the work.

Surface Mining Control and Reclamation Act. The Surface Mining and Reclamation Act (Pub. Resources Code, § 2710 et seq.) (SMARA) embodies a comprehensive scheme regulating surface mining and mandating reclamation in California. SMARA generally requires that, except for those in place before 1976, mining operations must obtain use permits regulating the manner in which mining can occur. In addition, both old and new operations must obtain reclamation plans governing how mined lands will be eventually restored. Regulations implementing SMARA are promulgated by the State Mining and Geology Board (See Cal. Code Regs., tit. 14, § 3500 et seq).

Although the Flow Decision does not directly implicate SMARA, it is possible that the spawning gravel needed for placement below Lewiston Dam may create a demand for newly permitted gravel mining operations. Any such operations would be subject to their own environmental review process under CEQA, and thus need not be covered either by this first-tier EIS/EIR or by any second-tier document generated in connection with specific channel modification projects. If existing permitted mining operations are able to supply an adequate amount of spawning gravel, there would be no need to permit new mines.

Trinity County Floodplain Development Permits. Section 29.4 of the Trinity County Zoning Ordinance (Floodplain Management Ordinance) requires issuance of a Floodplain Development Permit for projects that alter the Trinity River floodplain on private lands within the jurisdiction of Trinity County. The proposed channel restoration projects and spawning gravel replacement projects on private lands would require issuance of Floodplain Development Permits. Such permits would be subject to environmental review under CEQA. The principal requirement of the permit is a certification by a registered professional engineer or architect that the proposed project will not adversely affect the flood-carrying capacity of the altered or relocated portion of said watercourse, and will not cumulatively raise the 100-year floodplain more than 1 foot. The Ordinance also requires notification of adjacent communities, CDFG, Corps, NCRWQCB, and DWR prior to such alteration or relocation of a watercourse, and the submission of evidence of such notification to the Federal Insurance Administration and Federal Emergency Management Agency.

5.2 Individuals Involved in Preparation of EIS/EIR (CHANGES FOLLOW) pgs. 5-9 through 5-12

The following agency representatives and individuals were consulted and/or were involved in the preparation of this EIS/EIR.

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[a] Fish Team = Fisheries and Channel Restoration Team
[b] Wildlife Team = Wildlife-Riparian-Wetlands Team
[c] Recreation Team = Recreation-~~Visual Resources~~ Resources Team
[d] Water Team = Water Management and Operations Team

6.0 References *(SEE SUBSECTIONS)*

6.1 Publications **(CHANGES FOLLOW)**

The following references have been added:

California Energy Commission. 2000. California Energy Demand 2000-2010, Staff Report. June.

California Energy Commission. 1999. High Temperatures & Electricity Demand: An Assessment of Supply Adequacy in California Trends & Outlook. A report of the California Energy Commission Staff. July.

Hoopa Valley Tribe. 2000. Water Quality Control Plan, Hoopa Valley Indian Reservation. Adopted by the Hoopa Valley Tribal Council. June 8.

National Marine Fisheries Service. 2000. Biological Opinion for the Trinity River Mainstem Fishery Restoration EIS and its effects on Southern Oregon/Northern California Coast coho salmon, Sacramento River winter-run chinook salmon, Central Valley spring-run chinook salmon, and Central Valley steelhead. Southwest Region. October.

Rowell, J., U.S. Bureau of Reclamation, Sacramento, CA. 1998. Personal communication with Tim Hamaker, Fisheries Biologist, CH2M HILL, Redding, CA. 10 July.

U.S. Bureau of Reclamation. 1976b. Final Environmental Impact Statement, San Felipe Division, Volume I, Sacramento, CA.

U.S. Fish and Wildlife Service. 2000. Reinitiation of Formal Consultation. Biological Opinion on the Effects of Long-term Operation of the Central Valley Project and State Water Project as Modified by Implementing the Preferred Alternative in the Draft Environmental Impact Statement/Environmental Impact Report for the Trinity River Mainstem Fishery Restoration Program. Also, a Request for Consultation on the Implementation of this Alternative on the Threatened Northern Spotted Owl, Northern Spotted Owl Critical Habitat, and the Endangered Bald Eagle within the Trinity River Basin and where Applicable, Central Valley Reservoirs. Sacramento, CA. October.

6.2 Legal Reference *(NO CHANGE)*

Attachments *(SEE SUBSECTIONS)*

Attachment A Glossary of Terms, Abbreviations, and Acronyms, and Conversion Tables **(CHANGES FOLLOW)**

pg. A-4

Cubic feet per second (cfs)—A measure of the volume rate of water movement. As a rate of streamflow, a cubic foot of water passing a reference section in 1 second of time. One cubic foot per second equals 0.0283 m3/s (~~7.48~~ 448.83 gallons per minute). One cubic foot per second flowing for 24 hours produces approximately 2 af.

pg. A-14

The following new glossary term has been added:

X2—An SWRCB water quality criteria for the Bay-Delta relating to the management of water with 2 parts-per-thousand (ppt) concentration of salt. X2 is measured as kilometers (km) from the Golden Gate Bridge. Higher X2 values indicate salt water intrusion into the Delta (greater distance inland from the Golden Gate Bridge).

pgs. A-15 through A-20

The following new acronyms and abbreviations have been added:

AEAM	Adaptive Environmental Assessment and Management
Bay-Delta WQCP	Bay-Delta Water Quality Control Plan (1995)
CWA	Clean Water Act
FPR	Forest Practice Rules
Hoopa Valley WQCP	Hoopa Valley Tribe Water Quality Control Plan
HVTC	Hoopa Valley Tribal Council
LKRP	Lower Klamath Restoration Partnership
NCUAMD	North Coast Unified Air Management District
NPDES	National Pollutant Discharge Elimination System
Porter-Cologne	Porter-Cologne Water Quality Control Act
SMARA	Surface Mining and Reclamation Act
WDR	Waste Discharge Requirements

Attachment B Index *(NO CHANGE)*

2.3 Changes to the DEIS/EIR—Tables and Figures

Tables

1-1 Trinity River Restoration Program Goals *(NO CHANGE)*

2-1 Water-year Class *(NO CHANGE)*

2-2 Operations, Policies, and Regulatory Requirements Assumed in the No Action Alternative **(CHANGES FOLLOW)**

2-3 Trinity River Salmon and Steelhead Hatchery Production *(NO CHANGE)*

2-4 Annual Volumes and Peak Releases—Maximum Flow Alternative **(CHANGES FOLLOW)**

2-5 Annual Volumes and Peak Releases—Flow Evaluation Alternative **(CHANGES FOLLOW)**

2-6 Annual Volumes and Peak Releases—Percent Inflow Alternative **(CHANGES FOLLOW)**

2-7 Projected Distribution of Percent Inflow Peak Releases Based on Historical Flows *(NO CHANGE)*

2-8 Estimated Harvest and Escapement for Trinity River Chinook Salmon at Varying Reductions of Ocean and Inriver Harvest Rates (numbers rounded to the nearest 100) *(NO CHANGE)*

2-9 Summary Description of Alternatives **(CHANGES FOLLOW)**

2-10 Implementation Costs *(NO CHANGE)*

3-1 Attributes of a Healthy Alluvial River System *(NO CHANGE)*

3-2 Predicted Riverine Conditions by Alluvial River Attribute for Each Alternative Relative to No Action *(NO CHANGE)*

3-3 Comparison of Impacts on Water Resources **(CHANGES FOLLOW)**

3-4 Summary of Impacts to Groundwater Resources *(NO CHANGE)*

3-5 NCRWQCB Temperature Objectives for the Trinity River *(NO CHANGE)*

3-5A Water Temperature Criteria (°C) of the Hoopa Valley Tribe WQCP for the Mainsten Trinity River

3-6 Temperature Standards Required by 1993 Biological Opinion for Winter Chinook Salmon *(NO CHANGE)*

3-7 Combinations of Discharge and Water Temperatures Necessary to Meet SWRCB Temperature Objectives for the Trinity River Under Median Climatic Conditions *(NO CHANGE)*

3-8 Water Quality Summary Table Trinity River Impacts **(CHANGES FOLLOW)**

3-8A Percentage of the Year that Water Temperatures of the Trinity River Would Meet the Water Temperature Objectives Identified in the Hoopa Valley WQCP

3-9 Water Quality Summary Table Sacramento River Impacts **(CHANGES FOLLOW)**

3-10 Life History and Habitat Needs for Anadromous Salmonid Fish in the Trinity River Basin **(CHANGES FOLLOW)**

3-11 Life History and Habitat Characteristics of Non-salmonid Native Anadromous Fish in the Trinity River and/or Klamath River Basins *(NO CHANGE)*

3-12 Trinity River Restoration Program Goals *(NO CHANGE)*

3-13 Comparison of TRRP Inriver Spawner Escapement Goals to Average Numbers of Naturally Produced Fish *(NO CHANGE)*

3-13A Estimates of Yurok and Hoopa Valley Tribal Harvest of Adult Coho Salmon, 1984-1999

3-14 Estimated Spawning Escapement and Production Index for Trinity River Naturally Produced Chinook, Coho, and Steelhead *(NO CHANGE)*

3-15 Percent Change in Temperature-related Losses of the Early Life Stages of Anadromous Salmonids in the Sacramento River *(NO CHANGE)*

3-16 Percent of Years with Delta Outflows at Least 10 Percent Less than the Baseline *(NO CHANGE)*

3-17 Qualitative Impact Analysis for Fishery Resources (compared to the No Action Alternative) *(NO CHANGE)*

3-18 Percent Changes in Reservoir Water Surface Areas During the Warmwater Fish Spawning and Rearing Months of March through July *(NO CHANGE)*

3-19 Ocean Salmon Sportfishing Trips and Angler Benefits (in 1997 dollars) **(CHANGES FOLLOW)**

3-20 Fish Harvest Estimates by Alternative **(CHANGES FOLLOW)**

3-21 Total Ocean Commercial Salmon Harvest Impacts Compared to No Action (in 1997 dollars) *(NO CHANGE)*

3-22 Partial List of Tribal Trust Assets *(NO CHANGE)*

3-23 Impacts to Tribal Trust Resources *(NO CHANGE)*

3-24 Special-status Plant Species Occurring or Potentially Occurring in Riparian, Wetland, and Riverine Habitat along the Trinity and Lower Klamath Rivers **(CHANGES FOLLOW)**

3-25 Special-status Plant Species Potentially Occurring in the Central Valley **(CHANGES FOLLOW)**

3-26 Healthy River Attributes and Associated Riparian Characteristics *(NO CHANGE)*

3-27	Vegetation Impacts Compared to the No Action Alternative	*(NO CHANGE)*
3-28	Special-status Wildlife Species Occurring or Potentially Occurring in Riparian and Riverine Habitat in the Trinity River Basin	*(NO CHANGE)*
3-29	Special-status Wildlife Species Occurring or Potentially Occurring in the Central Valley	*(NO CHANGE)*
3-30	Wildlife Impacts Compared to the No Action Alternative	*(NO CHANGE)*
3-31	Wetland Impacts Compared to the No Action Alternative	*(NO CHANGE)*
3-32	Preferred Recreation Flow Ranges/Thresholds	**(CHANGES FOLLOW)**
3-33	Riverine Recreation Opportunities – Trinity River	**(CHANGES FOLLOW)**
3-34	Summary of Impacts to Riverine Recreation Use and Benefits	*(NO CHANGE)*
3-35	Trinity Reservoir Elevations at which Facility Operations Are Adversely Affected	*(NO CHANGE)*
3-36	Summary of Impacts to Trinity, Shasta, and Folsom Reservoir Recreation Opportunities	**(CHANGES FOLLOW)**
3-37	Summary of Impacts to Reservoir Use and Benefits	**(CHANGES FOLLOW)**
3-38	Trinity, Shasta and Folsom Reservoir Recreation Opportunities, Use, and Benefits	**(CHANGES FOLLOW)**
3-39	Traffic Volume in the Trinity River Basin	*(NO CHANGE)*
3-40	Parcels and Bridges Inundated by Alternative and Site	*(NO CHANGE)*
3-41	Summary of Municipal Water Supply Economics	*(NO CHANGE)*
3-42	Comparison of Preferred Alternative and Existing Conditions Alternative Results	*(NO CHANGE)*
3-43	Crop Mix, Value per Acre, and Total Value of Crops Produced on Land Receiving CVP Water (1988)	*(NO CHANGE)*
3-44	Central Valley Agricultural Land Use, Water Use, and Revenue	*(NO CHANGE)*
3-45	Summary of Agricultural Land Use Impacts as Compared to the No Action Alternative	*(NO CHANGE)*
3-46	Property Value Impact Ranking Summary	**(CHANGES FOLLOW)**
3-47	Hydroelectric Generation Facilities	*(NO CHANGE)*
3-48	Western Customers by Agency and Sub-agency Type and Associated Firm Power	*(NO CHANGE)*
3-49	Power Resources Summary Table	**(CHANGES FOLLOW)**
3-50	Employment Data for Trinity River Basin	*(NO CHANGE)*

3-51 Employment Data for Lower Klamath River Basin/Coastal Area Regions, 1992

3-52 Employment Data for Central Valley Regions, 1991 *(NO CHANGE)*

3-53 Impact Thresholds by Analysis Type and Region *(NO CHANGE)*

3-54 Trinity River Basin Region (Defined as Trinity County for Up-front Impacts, and Trinity and Shasta Counties for Annual Impacts **(CHANGES FOLLOW)**

3-55 Lower Klamath River Basin/Coastal Area Regions **(CHANGES FOLLOW)**

3-56 Central Valley Regions *(NO CHANGE)*

4-1 CVP Contract Allocation Assumed to be Used in Existing Conditions, No Action, Preferred Alternative, and Cumulative Impacts Scenarios *(NO CHANGE)*

4-2 Comparison of CVP Deliveries in the Existing Conditions, No Action, Preferred Alternative, and Cumulative Impacts Simulations *(NO CHANGE)*

4-3 Comparison of SWP Deliveries in the Existing Conditions, No Action, Preferred Alternative, and Cumulative Impacts Simulations *(NO CHANGE)*

4-3A Modeling Assumptions

4-4 Summary of Significant Adverse Environmental Impacts and Proposed Mitigation **(CHANGES FOLLOW)**

5-1 Agency Participation *(NO CHANGE)*

Figures

1-1 Trinity River Basin (excluding portion upstream of Trinity Reservoir) *(NO CHANGE)*

1-2 Trinity River Inflows, Instream Releases, and Exports *(NO CHANGE)*

2-1 No Action Hydrograph *(NO CHANGE)*

2-2 Maximum Flow Hydrograph *(NO CHANGE)*

2-3 Flow Evaluation Hydrograph *(NO CHANGE)*

2-4 Trinity River Existing and Potential Channel Rehabilitation Sites **(CHANGES FOLLOW)**

2-5 Percent Inflow Hydrograph Based on Representative Years *(NO CHANGE)*

2-6 State Permit Hydrograph *(NO CHANGE)*

2-7 No Action (and Mechanical Restoration) Long-term Average Annual Exports and Releases *(NO CHANGE)*

2-8 Long-term Average Annual Exports and Releases for Maximum Flow, Flow Evaluation, Percent Inflow, and State Permit Alternatives **(CHANGES FOLLOW)**

3-1 Relationship of Models Used for Resource Analyses *(NO CHANGE)*

3-2	Geographic Scope of EIS/EIR	*(NO CHANGE)*
3-3	Resource Linkage Overview	*(NO CHANGE)*
3-4	Idealized Geomorphic Environment, Including Riparian and Sediment Effects	*(NO CHANGE)*
3-5	1960 Aerial Photo of Junction City Pre-dam Geomorphology	**(CHANGES FOLLOW)**
3-6	Simplified Geomorphology, Pre-dam versus Current Conditions	*(NO CHANGE)*
3-7	1989 Aerial Photo of Junction City Post-dam Geomorphology	**(CHANGES FOLLOW)**
3-8	Flows Required for Creation of Alluvial River Attributes	**(CHANGES FOLLOW)**
3-9	Pre-dam Daily Flow Comparisons	*(NO CHANGE)*
3-10	Trinity River Division and Neighboring Shasta Division	*(NO CHANGE)*
3-11	Developed Profile, Trinity River Diversion	*(NO CHANGE)*
3-12	Central Valley Project Facilities, Regulated Rivers, and Divisions	*(NO CHANGE)*
3-13	Central Valley Project River Profile	*(NO CHANGE)*
3-14	Delta Waterways	*(NO CHANGE)*
3-15	How to Read a Frequency Distribution Curve	*(NO CHANGE)*
3-16	Simulated Frequency of Annual Flows in the Trinity River Below Lewiston and Annual Trinity River Basin Exports	*(NO CHANGE)*
3-17	Simulated Frequency of End-of-water-year Storage—Shasta, Trinity, and Folsom Reservoirs	*(NO CHANGE)*
3-18	Simulated Frequency of Annual Deliveries—CVP Water Service Contractors North of the Delta	*(NO CHANGE)*
3-19	Simulated Frequency of Annual Deliveries—CVP Water Service Contractors South of the Delta	*(NO CHANGE)*
3-20	Simulated Frequency of Annual Deliveries to SWP Agricultural and M&I Entitlement Holders South of the Delta	*(NO CHANGE)*
3-21	Aerial Extent of Land Subsidence in the Central Valley Due to Groundwater Elevations	*(NO CHANGE)*
3-22	Groundwater Study Area	*(NO CHANGE)*
3-23	Groundwater Elevations, No Action Alternative	*(NO CHANGE)*
3-24	Increase in Simulated Land Subsidence in Maximum Flow Alternative from No Action Alternative	*(NO CHANGE)*
3-25	Differences in Groundwater Elevations for Maximum Flow Alternative as Compared to No Action Alternative	*(NO CHANGE)*

3-26 Differences in Groundwater Elevations for Flow Evaluation Alternative as Compared to No Action Alternative *(NO CHANGE)*

3-27 Increase in Simulated Land Subsidence in Flow Evaluation Alternative from No Action Alternative *(NO CHANGE)*

3-28 Differences in Groundwater Elevations for Percent Inflow Alternative as Compared to No Action Alternative *(NO CHANGE)*

3-29 Increase in Simulated Land Subsidence in Percent Inflow Alternative from No Action Alternative *(NO CHANGE)*

3-30 Differences in Groundwater Elevations for State Permit Alternative as Compared to No Action Alternative *(NO CHANGE)*

3-31 Differences in Groundwater Elevations for Preferred Alternative as Compared to Existing Conditions *(NO CHANGE)*

3-32 Locations of Winter Chinook Salmon Biological Opinion Temperature Compliance *(NO CHANGE)*

3-33 Output Locations for Simulated Average Monthly Water Quality *(NO CHANGE)*

3-34 General Life History of Anadromous Salmonids *(NO CHANGE)*

3-35 Temporal Distribution of Anadromous Salmonid Reproduction **(CHANGES FOLLOW)**

3-36 Fall Chinook Spawner Escapement in the Mainstem Trinity River (1982-1997) *(NO CHANGE)*

3-37 Geographic Location of Coastal Study Area **(CHANGES FOLLOW)**

3-38 Trinity Basin Indian Reservations *(NO CHANGE)*

3-39 Habitat Change Pre-dam vs. Post-dam *(NO CHANGE)*

3-40 Habitat for Riverine Wildlife Species, Pre-dam and Present Conditions *(NO CHANGE)*

3-41 Trinity River Basin Land Ownership *(NO CHANGE)*

3-42 Flood Damage Study Site Locations *(NO CHANGE)*

3-43 1990 Normalized Irrigated Acres and Central Valley Irrigation Water Deliveries by Source from 1985-1992 *(NO CHANGE)*

3-44 1990 Agricultural Land Use in the Central Valley and San Felipe Unit *(NO CHANGE)*

3-45 CVP Power Generation Facilities and Associated Transmission Facilities *(NO CHANGE)*

3-46 Western Area Power Administration, Sierra Nevada Region, Marketing Area *(NO CHANGE)*

4-1 Trinity Reservoir Simulated Frequency End-of-water-year Storage, Water Years 1922-1990 *(NO CHANGE)*

4-2 Shasta Reservoir Simulated Frequency of End-of-water-year Storage, Water Years 1922-1990 *(NO CHANGE)*

4-3 Folsom Reservoir Simulated Frequency of End-of-water-year Storage, Water Years 1922-1990 *(NO CHANGE)*

4-4 American River below Natomas Simulated Monthly Flows *(NO CHANGE)*

4-5 Oroville Reservoir Simulated Frequency of End-of-water-year Storage, Water Years 1922-1990 *(NO CHANGE)*

4-6 PROSIM Average (1983-1993) CVP Allocations South of the Delta

4-7 PROSIM Average (1983-1993) CVP Allocations North of the Delta

TABLE 2-2
Operations, Policies, and Regulatory Requirements Assumed in the No Action Alternative

Issue or Policy	Description
Acreage Limitations in Contracts	Existing acreage limitation regulations adopted to implement Reclamation Reform Act of 1982.
CVP Operations	Continued operations as presented in CVP-OCAP 1992 and other operational procedures for CVP, adjusted for biological opinions and water quality standards. (Biological Opinion [May 1995] for winter chinook salmon and delta smelt. Biological Opinion for winter chinook salmon assumptions include maintenance of minimum Shasta Reservoir carryover storage of 1.9 maf in all years, except in driest 10 percent of years where reconsultation is needed. Monthly temperature targets at Bend Bridge and Jellys Ferry per the Biological Opinion, Bay-Delta Plan Accord, and SWRCB Order 95-06).
Contract Amounts for CVP (including shortage criteria)	Contracts would be renewed, per 1956 and 1963 Acts, prior to year 2020, including contracts with CVP and DWR associated with the Cross-Valley Canal.
	Maximum Contract Amount: Not-to-exceed existing contract amounts. Water deliveries not-to-exceed capacity of existing conveyance facilities.
	Agricultural Water Service Contracts, Water Rights Contracts, and Exchange Contracts: CVP water deliveries limited by maximum use between 1980 and 1993; projected use as addressed in environmental documentation; or maximum contract amount, whichever is less. Shortage criteria per, Operations Criteria and Plan (OCAP).
	Municipal and Industrial Water Service Contracts: Total demand based upon year 2020 demands in DWR Bulletin 160-93. CVP water deliveries limited by a) maximum use between 1980 and 1993; b) projected use as addressed in approved environmental documentation; or c) maximum contract amount, whichever is less. Shortage criteria with maximum shortage of 25 percent.
	Refuges: Delivery of Level 1 and Level 2 water supplies by existing suppliers. Shortage criteria using SWRCB Sacramento Valley 40-30-30 Index.
CVP Conservation Program	A long-term adaptive management program to address biological needs of special-status species, with an emphasis on habitat in areas affected by the CVP.
Coordinated Operations of CVP and SWP	Based upon COA framework with additional assumptions to implement new provisions of Bay-Delta Plan.
Delta Factors	Continued use of seasonal barriers at Old River and continued operation of Delta Cross-Channel gates.
Land Retirement	Retirement of 45,000 acres between 1992 and 2020 under existing State of California ***land retirement*** programs, per DWR Bulletin 160-93.
Minimum Instream Flow Requirements	**Sacramento River:** Per SWRCB Order 91-01 and the Winter-run Chinook Salmon Biological Opinion.

TABLE 2-2
Operations, Policies, and Regulatory Requirements Assumed in the No Action Alternative

Issue or Policy	Description
for CVP Facility	**American River:** Per Modified SWRCB D-1400 strategy of CVP operations with a fixed amount of flood control storage under the Corps interim requirements. **Stanislaus River:** Per SWRCB D-1422, including water quality standards on the San Joaquin River at Vernalis and ***dissolved oxygen*** requirements at Ripon; and 155,700 af/yr in all years but critically dry years, then 98,300 af/yr per initial studies conducted under the 1987 agreements with CDFG and the Service. **Trinity River:** Per Secretary's 1991 Decision ~~and CVPIA 3406(b)(23)~~ a flow not less then 340,000 af/yr in all years.
Shortage Criteria for State Water Project	Monterey agreement provisions for SWP.
Non-CVP Water Users	Use water demands in DWR Bulletin 160-93.
Power Marketing	Existing agreement between United States and Pacific Gas and Electric Company (PG&E) would not be renewed. Project use load met at all times.
Red Bluff Diversion Dam (RBDD) Gate Closure	Mid-May through mid-September per Winter-run Chinook Salmon Biological Opinion.
Tracy Direct Loss Mitigation Agreement	Reduces and offsets direct fish loss associated with operations of the Tracy Pumping Plant and Fish Facility.
Water Conservation	Water conservation levels based on assumptions presented in DWR Bulletin 160-93 for all water users, plus requirements by 1982 Reclamation Reform Act for CVP contractors.
CVP Rate Setting and Water Pricing	Existing rate setting and cost-allocation policies, and ability-to-pay policies per Reclamation Mid-Pacific Region Policies, including 1988 policies, and Reclamation Reform Act draft rules and regulations.
Water Transfer	CVP water can be transferred between ***CVP water service contractors***. SWP water can be transferred per the Monterey Agreement, and water rights holders can transfer water under SWRCB guidelines.
Water Rights	Total water rights would be delivered in all water-year classes (except in shortage conditions) even if water rights had not been previously fully utilized.
U.S. Department of Agriculture (USDA) Farm Commodities Program	Program would remain in place and would follow 1992 policies.

TABLE 2-4
Annual Volumes and Peak Releases—Maximum Flow Alternative

Water-year class	Acre-feet	Peak Flow ~~(af)~~ (cfs)
Critically dry	463,000	2,000
Dry	889,000	3,800
Normal	1,206,000	5,429
Wet	1,508,000	6,786
Extremely wet	2,146,000	30,000

Peak flow releases and timing: 30,000 cfs/5 days in May (extremely wet years only)

TABLE 2-5
Annual Volumes and Peak Releases—Flow Evaluation Alternative

Water-year Class	Acre-feet	Peak Flow ~~(af)~~ (cfs)
Critically dry	369,000	1,500
Dry	453,000	4,500
Normal	~~636,000~~ 647,000	6,000
Wet	701,000	8,500
Extremely wet	815,000	11,000

Peak flow releases and timing: 11,000 cfs/5 days in May (extremely wet water-year class only)

TABLE 2-6
Annual Volumes and Peak Releases—Percent Inflow Alternative

Water-year Class	Acre-feet	Peak Flow ~~(af)~~ (cfs)
Critically dry	165,000	696
Dry	325,000	1,306
Normal	443,000	1,740
Wet	655,000	2,476
Extremely wet	978,000	3,745

Peak flow over modeled hydrologic record: 11,000 cfs

TABLE 2-9
Summary Description of Alternatives

Features	Alternatives					
	No Action	**Maximum Flow**	**Flow Evaluation**	**Percent Inflow**	**Mechanical Restoration**	**State Permit**
Water Management Trinity River instream flows	Not less than 340,000 af in all water-year classes	Critically dry 463,000 af Dry 889,000 af Normal 1,206,000 af Wet 1,508,000 af Extremely wet 2,146,000 af	Critically dry 369,000 af Dry 453,000 af Normal ~~636,000~~ 647,000 af Wet 701,000 af Extremely wet 815,000 af	Critically dry 165,000 af Dry 325,000 af Normal 443,000 af Wet 655,000 af Extremely wet 978,000 af	Same as No Action	120,500 af in all water-year classes
Peak flow releases and duration	2,000 cfs for 17 days in May	30,000 cfs for 5 days in May (extremely wet water year)	11,000 cfs for 5 days in May (extremely wet water year)	Estimated peak release of 11,000 cfs for 1 week (based on historical records)	Same as No Action	250 cfs for 30 days in November
Water Operations	Maintain current operation of CVP as identified in CVP-OCAP (including current Biological Opinions & December 15, 1994 Bay/Delta Accord Principles).	No diversions through Clear Creek Tunnel; assumes appropriate revisions to OCAP and endangered species consultation as necessary. Water-year determinations would likely need to emphasize storage-based criteria in addition to predicted Trinity inflow.	Timing of diversions through Clear Creek Tunnel would be shifted to the summer/ early fall period; assumes appropriate revisions to OCAP and endangered species as necessary.	Timing of diversions through Clear Creek Tunnel would be shifted to the summer/early fall period; assumes appropriate revisions to OCAP and endangered species consultation as necessary.	Same as No Action	Greater quantity of water would be diverted through the Clear Creek Tunnel; assumes appropriate revisions to OCAP and endangered species consultation as necessary.
Carryover storage	400,000 af	Same as No Action	600,000 af	600,000 af	Same as No Action	Same as No Action
Watershed Protection	Maintain sediment control structures Administer existing land management plans and enforce Trinity County grading ordinance Implement South Fork Trinity River Action Plan Enforce CDF Forest Practice Rules	Same as No Action	Same as No Action	Same as No Action	No Action measures plus additional maintenance and rehabilitation of road system within the watershed	Same as No Action
Fish Habitat Management						
Mechanical Channel Rehabilitation						
Maintain 27 existing rehabilitation projects	X				X	
Construct 47 additional rehabilitation projects			X	X	X	
Maintain existing and proposed projects mechanically					X	
Maintain existing and proposed projects with flow			X	X		
Place spawning gravel (quantity/ frequency) (note – the figures are estimates, actual volumes could vary by plus/minus 50 percent or greater)	Place 3,400 yd^3/yr of gravel (assumes gravel placement associated with Safety of Dam releases)	Water-year Class — yd^3/yr Critically dry 0 Dry 150 Normal 1,500 Wet 14,550 Extremely wet >100,000 (assumes that placement of spawning gravel associated with Safety of Dam releases does not occur)	Water-year Class — yd^3/yr Critically dry 0 Dry 200 Normal 2,000 Wet 14,200 Extremely wet 49,100 (assumes that placement of spawning gravel associated with Safety of Dam releases does not occur)	Water-year Class — yd^3/yr Critically dry 0 Dry 0 Normal 50 Wet 1,350 Extremely wet 4,650 (assumes that placement of spawning gravel associated with Safety of Dam releases does not occur)	Same as No Action	Place 3,700 yd^3/yr of gravel (assumes gravel placement associated with Safety of Dam releases)
Sediment dredging pools	Grass Valley Creek ponds	Same as No Action	Same as No Action	Same as No Action	No Action measures plus 10 pools in mainstem	Same as No Action
Fish Population Management	Maintain current fishing policies	Same as No Action	Same as No Action	Same as No Action	Same as No Action	Same as No Action
Trinity Dam Modifications	No	Yes	No	No	No	No

TABLE 3-3
Comparison of Impacts on Water Resources

Parameter	Hydrologic Conditions[a]	Alternatives Compared to No Action: No Action	Maximum Flow	Flow Evaluation	Percent Inflow	Mechanical Restoration	State Permit	Existing Conditions	Preferred Alternative to Existing Conditions
Trinity Reservoir elevation (ft)	Dry	~~2,255~~	~~34~~	~~11~~	~~19~~	0	~~22~~	2,267	-1
		2,264	25	2	10		13		
May 30	Wet	~~2,352~~	~~-43~~	~~-3~~	~~-8~~	0	~~6~~	2,357	-8
		2,357	–48	–8	-13		1		
	Average	~~2,319~~	~~-33~~	~~4~~	~~2~~	0	~~16~~	2,325	-2
		2,325	–39	–2	-4		10		
September 30	Dry	~~2,207~~	~~-64~~	~~18~~	~~25~~	0	~~11~~	2,217	8
		2,214	57	11	18		4		
	Wet	~~2,318~~	~~-18~~	~~-2~~	~~-2~~	0	~~4~~	2,320	-4
		2,319	–19	–3	-3		3		
	Average	~~2,282~~	~~-9~~	~~2~~	~~4~~	0	~~11~~	2,287	-3
		2,285	–12	–1	1		8		
Shasta Reservoir elevation (ft)	Dry	995	-22	-7	-3	0	0	998	-10
May 30	Wet	1,062	-3	-3	-1	0	1	1,062	-3
	Average	1,045	-5	-3	-1	0	1	1,046	-4
September 30	Dry	933	-65	-11	-1	0	3	939	-17
	Wet	1,020	-15	-6	-2	0	2	1,020	-6
	Average	992	-15	-3	0	0	4	995	-6
San Luis Res. elevation (ft)	Dry	467	4	1	1	0	-3	463	5
May 30	Wet	511	-2	1	0	0	1	520	-8
	Average	487	4	1	0	0	0	491	-3
September 30	Dry	381	-3	-2	0	0	-5	373	6
	Wet	430	-10	1	-1	0	1	445	-14
	Average	396	-2	-2	0	0	0	401	-7
Trinity River Exports (af/yr)	Dry	540,000	-100%	-30%	-2%	0%	39%	530,000	-28%
	Wet	1,110,000	-100%	-33%	-26%	0%	17%	1,100,000	-33%
	Average	870,000	-100%	-28%	-16%	0%	23%	870,000	-28%
Trinity Reservoir storage (af)	Dry	730,000	60%	5%	14%	0%	5%	750,000	3%
September 30	Wet	1,720,000	-15%	-2%	-2%	0%	2%	1,730,000	-2%
	Average	1,390,000	-12%	-4%	-1%	0%	6%	1,400,000	-4%

TABLE 3-3
Comparison of Impacts on Water Resources

Parameter	Hydrologic Conditions[a]	Alternatives Compared to No Action: No Action	Maximum Flow	Flow Evaluation	Percent Inflow	Mechanical Restoration	State Permit	Existing Conditions	Preferred Alternative to Existing Conditions
Shasta Reservoir storage (af)	Dry	1,690,000	-30%	-8%	-1%	0%	2%	1,780,000	-12%
September 30	Wet	3,290,000	-10%	-4%	-1%	0%	1%	3,280,000	-4%
	Average	2,770,000	-8%	-2%	0%	0%	2%	2,810,000	-4%
San Luis Reservoir storage (af)	Dry[b]	390,000	-5%	-3%	0%	0%	-10%	340,000	12%
September 30	Wet	850,000	-13%	0%	-1%	0%	1%	990,000	-14%
	Average	540,000	-6%	-4%	-2%	0%	-2%	590,000	-12%
CVP deliveries north of Delta[b] (af/yr)	Dry[b]	2,680,000	-6%	-4%	0%	0%	2%	2,390,000	8%
	Wet	3,240,000	-1%	0%	0%	0%	0%	2,880,000	13%
	Average	3,120,000	-4%	-1%	0%	0%	1%	2,780,000	11%
CVP deliveries south of Delta[b] (af/yr)	Dry[b]	1,580,000	-13%	-3%	1%	0%	13%	1,630,000	-6%
	Wet	2,960,000	-3%	-1%	0%	0%	0%	2,980,000	-1%
	Average	2,570,000	-13%	-2%	0%	0%	2%	2,600,000	-3%
Exports, Tracy Pumping Plant (af/yr)	Dry	1,810,000	-13%	-5%	0%	0%	10%	1,830,000	-6%
	Wet	2,850,000	-1%	0%	0%	0%	0%	2,870,000	-1%
	Average	2,640,000	-12%	-2%	0%	0%	2%	2,670,000	-3%
Exports, Banks Pumping Plant (af/yr)	Dry	1,860,000	-2%	~~1%~~ 2%	0%	0%	3%	1,880,000	1%
	Wet	4,060,000	-1%	-1%	0%	0%	-1%	3,160,000	27%
	Average	3,310,000	-1%	0%	0%	0%	0%	2,890,000	14%
Exports, Tracy and Banks Pumping Plants (af/yr)	Dry	3,670,000	-5%	-2%	0%	0%	6%	3,710,000	-3%
	Wet	6,910,000	-1%	-1%	0%	0%	0%	6,030,000	14%
	Average	5,950,000	-6%	-1%	0%	0%	1%	5,560,000	6%

TABLE 3-3
Comparison of Impacts on Water Resources

Parameter	Hydrologic Conditions[a]	Alternatives Compared to No Action						Existing Conditions	Preferred Alternative to Existing Conditions
		No Action	Maximum Flow	Flow Evaluation	Percent Inflow	Mechanical Restoration	State Permit		
Delta Inflow (af/yr)	Dry	11,830,000	-2%	-1%	0%	0%	2%	11,850,000	~~0%~~ -1%
	Wet	29,730,000	-4%	-1%	-1%	0%	1%	29,690,000	-1%
	Average	22,570,000	-4%	-1%	-1%	0%	1%	22,550,000	-1%
Delta Outflow (af/yr)	Dry	6,320,000	-1%	0%	0%	0%	-1%	6,320,000	0%
	Wet	20,890,000	-5%	-1%	-1%	0%	1%	21,770,000	-5%
	Average	14,710,000	-3%	-1%	-1%	0%	1%	15,120,000	-4%
Trinity River releases (af/yr)	Critically dry	340,000[b]	36%	8.5%	-51%	0%	-65%	340,000	8.5%
	Dry	340,000[b]	160%	33%	-4.7%	0%	-65%	340,000	33%
	Normal	340,000[b]	250%	~~87~~ 90%	30%	0%	-65%	340,000	87%
	Wet	340,000[b]	340%	110%	93%	0%	-65%	340,000	110%
	Extremely wet	340,000[b]	530%	140%	190%	0%	-65%	340,000	140%

[A]"Dry" is based on hydrology in the dry period (1928-34); "wet" is based on a wet period (1967-71); and "average" is based on the long-term average (1922-90).

[B]Plus additional releases as required by U.S. Bureau of Reclamation Safety of Dams criteria, if needed.

TABLE 3-5A
Water Temperature Criteria (°C) of the Hoopa Valley Tribe WQCP for the Mainstem Trinity River

Water-year Class	Time Periods				
Extremely Wet, Wet, and Normal	May 23 - Jun 4	Jun 5 - Jul 9	Jul 10 - Sep 14	Sep 15 - Oct 31	Nov 1 - May 22
Criteria [a]	15.0	17.0	22.1	19.0	13.0
Dry and Critically Dry	May 23 - Jun 4	Jun 5 – Jun 15	Jun 16 - Sep 14	Sep 15 - Oct 31	Nov 1 - May 22
Criteria [a]	17.0	20.0	23.5	19.0	15.0

[a]Criteria represent 7-day running averages and are not to be exceeded.

TABLE 3-8A
Percentage of the Year that Water Temperatures of the Trinity River Would Meet the Water Temperature Objectives Identified in the Hoopa Valley Tribe WQCP

Water Year	Expected No. of Occurrences Per 100 Years	Modeled Year	Alternatives							
			State Permit	No Action	Percent Inflow	Flow Evaluation	Maximum Flow	Exist. Contd.	Cum. 400K[a]	Cum. 600K[a]
C.Dry	12	1977	88	88	87	92	100	88	88	92
Dry	28	1990	85	92	88	94	98	92	94	94
Normal	20	1989	65	69	71	85	94	69	81	87
Wet	28	1986	69	73	77	92	94	73	92	92
E.Wet	12	1983	94	100	94	100	90	100	100	100
Wt. Avg.	-	-	78	83	82	92	96	83	91	93

[a]Flow schedules are identical to the Flow Evaluation Alternative. These alternatives, which utilize different minimum carryover storages in Trinity Reservoir, were evaluated for the influence of altered diversion patterns on the Hoopa EPA criteria.

TABLE 3-9
Water Quality Summary Table Sacramento River Impacts

	No Action	Maximum Flow	Flow Evaluation	Percent Inflow	Mechanical Restoration	State Permit	Existing Conditions
Sacramento River Violations[a]							
Percentage of months with violations	~~19.7%~~ 15.9%	22.8%	20.5%	20.1%	~~19.7%~~ 15.9%	16.4%	14.3%
Shasta Carryover Storage Violations							
Percentage of years less than 1.9 maf	11.6%	14.5%	11.6%	11.6%	11.6%	10.1%	8.7%
Average Modeled Position of X2 in Delta, Distance from Golden Gate Bridge (km)							
Average Period (1922-1990)	75.2	75.6	75.3	75.3	75.2	75.1	74.9
Wet Period (1967-1971)	70.1	71.0	70.5	70.3	70.1	70.0	69.6
Dry Period (1928-1934)	80.7	80.8	80.6	80.7	80.7	80.7	80.7

[a]As established in the Sacramento Winter-run Biological Opinion. Temperature standards are enforced April through October.

TABLE 3-10
Life History and Habitat Needs for Anadromous Salmonid Fish in the Trinity River Basin

Name	Migration	Spawning	Rearing	Rearing Habitat Description
Chinook (spring)	Spring-Summer	Early Fall	Winter-Spring-Summer	Shallow, slow-moving waters adjacent to higher water velocities for feeding.
Chinook (fall)	Fall	Fall	Winter-Spring-Summer	Shallow, slow-moving waters adjacent to higher water velocities for feeding.
Steelhead (winter)	Fall-winter	February-April	Year round	Areas of clean cobble where there is refuge from high velocities; juveniles overwinter for 1-2 or more years.
Steelhead (summer)	Spring-Summer	February-April	Year round	Areas of clean cobble where there is refuge from high velocities; juveniles overwinter for 1-2 or more years.

TABLE 3-13A
Estimates of Yurok and Hoopa Valley Tribal Harvest of Adult Coho Salmon, 1984-1999

Year	Yurok Harvest[a]	Hoopa Harvest[b]	Total	Escapement above Willow Creek Weir[c]
1984	360	376	736	4,486
1985	1,894	1,115	3,009	29,717
1986	163	85	248	9,063
1987	904	608	1,512	51,826
1988	573	210	783	36,173
189	511	477	988	18,462
1990	377	88	465	3,485
1991	391	105	496	8,859
1992	122	52	174	7,961
1993	1,164	111	1,275	5,048
1994	25	25	50	239
1995	826	38	864	1,547
1996	738	208	946	35,391
1997	75	58	133	1,984
1998	180	136	316	
1999	235	101	336	
Average	**534**	**237**	**771**	

[a]Yurok Tribe unpublished data; 1999 annual report in preparation.

[b]Personal communication, George Kautsky, Fishery Biologist, Hoopa Valley Tribe Fisheries Department.

[c]Escapement of adult coho salmon into Trinity River above Willow Creek weir operated by California Department of Fish and Game. From CDFG Annual Performance Report, Trinity River Basin Salmon and Steelhead Monitoring Project, 1997-1998, Includes inriver spawners, hatchery returns, and angler harvest.

TABLE ~~3-20~~ 3-19
Fish Harvest Estimates by Alternative

	Alternatives					
	No Action	**Maximum Flow**	**Flow Evaluation**	**Percent Inflow**	**Mechanical Restoration**	**State Permit**
Ocean Salmon Commercial Fishery						
Northern /Central Oregon						
Trinity River naturally produced	1,390	21,520	17,330	4,810	3,440	0
Total	369,100	580,300	565,500	517,700	511,600	197,500
KMZ-Oregon						
Trinity River naturally produced	50	1,280	990	220	150	0
Total	2,500	27,100	25,200	18,800	17,900	0
KMZ-California						
Trinity River naturally produced	50	1,070	860	190	120	0
Total	2,100	23,800	22,100	16,500	15,800	0
Mendocino						
Trinity River naturally produced	150	3,480	2,710	630	430	0
Total	13,700	96,600	85,600	49,800	45,200	0
San Francisco						
Trinity River naturally produced	1,030	4,470	4,170	2,330	1,910	0
Total	199,300	208,200	208,200	208,200	208,200	144,700
Monterey						
Trinity River naturally produced	800	3,480	3,240	1,820	1,490	0
Total	155,100	155,100	155,100	155,100	155,100	112,300
Totals for All Regions						
Trinity River naturally produced	3,470	35,300	29,300	10,000	7,540	0
Total	741,800	1,091,100	1,061,700	966,100	953,800	454,500
Ocean Salmon Sport Fishery						
Northern/Central Oregon	99,200	156,000	152,100	139,200	137,600	53,100
KMZ-Oregon	3,600	38,700	36,000	26,900	25,600	3,600
KMZ-California	4,000	45,200	42,000	31,300	30,000	4,000
Mendocino	2,200	15,600	13,800	8,000	7,300	2,200
San Francisco	73,800	77,100	77,100	77,100	77,100	53,600
Monterey	50,000	50,000	50,000	50,000	50,000	36,200
Total for All Regions	**232,800**	**382,600**	**371,000**	**332,300**	**327,600**	**152,700**

TABLE ~~3-19~~ 3-20
Ocean Salmon Sportfishing Trips and Angler Benefits (in 1997 dollars)

		Change Compared to No Action					Change to Existing Conditions	
Trips and Benefits by Region of Activity	**No Action**	**Maximum Flow**	**Flow Evaluation**	**Percent Inflow**	**Mechanical Restoration**	**State Permit**	**1995 Existing Conditions**	**2020 Preferred Alternative**
Northern/Central Oregon[a]								
Total Trips	186,710	207,050	205,830	201,720	201,170	161,880	150,740	205,830
Angler benefits	$13,443,120	$14,907,600	$14,819,400	$14,523,840	$14,484,240	$11,655,720	$10,853,640	$14,819,400
Net change in angler benefits		$1,464,480	$1,376,280	$1,080,720	$1,041,120	-$1,787,400		$3,965,760
Percent change in angler benefits		11%	10%	8%	8%	-13%		37%
KMZ-Oregon[a]								
Total Trips	56,970	95,970	94,390	88,280	87,300	49,330	38,960	94,390
Angler benefits	$4,101,840	$6,909,840	$6,796,080	$6,356,160	$6,285,600	$3,551,760	$2,805,120	$6,796,080
Net change in angler benefits		$2,808,000	$2,694,240	$2,254,320	$2,183,760	-$550,080		$3,990,960
Percent change in angler benefits		68%	66%	55%	53%	-13%		142%
KMZ-California[a]								
Private boat trips	40,930	50,080	49,540	47,430	47,130	32,890	27,720	49,540
Private boat angler benefits	$2,516,400	$3,605,760	$3,566,880	$3,414,960	$3,393,360	$2,367,360	$1,879,200	$3,566,520
Net change in angler benefits[a]		$1,089,360	$1,050,480	$898,560	$876,960	-$149,040		$1,687,320
Percent change in angler benefits		43%	42%	36%	35%	-6%		90%
Charter boat trips	1,290	2,250	2,210	2,070	2,050	1,170	1,020	2,210
Charter boat angler benefits	$92,880	$162,000	$159,120	$149,040	$147,600	$84,240	$73,440	$159,120
Net change in angler benefits[a]		$69,120	$66,240	$56,160	$54,720	-$8,640		$85,680
Percent change in angler benefits		74%	71%	60%	59%	-9%		117%
Mendocino[a]								
Private boat trips	29,700	39,680	38,970	35,970	35,440	22,170	21,060	38,970
Private boat angler benefits	$2,137,680	$2,856,960	$2,805,840	$2,589,840	$2,551,680	$1,596,240	$1,516,320	$2,805,840
Net change in angler benefits		$719,280	$668,160	$452,160	$414,000	-$541,440		$1,289,520
Percent change in angler benefits		34%	31%	21%	19%	-25%		85%
Charter boat trips	4,020	6,270	6,110	5,390	5,290	2,580	2,860	6,110
Charter boat angler benefits	$290,160	$451,440	$439,920	$388,080	$380,880	$185,760	$205,920	$439,920
Net change in angler benefits		$161,280	$149,760	$97,920	$90,720	-$104,400		$234,000

TABLE ~~3-19~~ 3-20
Ocean Salmon Sportfishing Trips and Angler Benefits (in 1997 dollars)

		Change Compared to No Action					Change to Existing Conditions	
Trips and Benefits by Region of Activity	**No Action**	**Maximum Flow**	**Flow Evaluation**	**Percent Inflow**	**Mechanical Restoration**	**State Permit**	**1995 Existing Conditions**	**2020 Preferred Alternative**
Percent change in angler benefits		56%	52%	34%	31%	-36%		114%
San Francisco[a]								
Private boat trips	57,100	57,100	57,100	57,100	57,100	54,330	44,800	57,100
Private boat angler benefits	$4,110,480	$4,110,480	$4,110,480	$4,110,480	$4,110,480	$3,911,760	$3,225,600	$4,110,480
Net change in angler benefits		$0	$0	$0	$0	-$198,720		$884,880
Percent change in angler benefits		0%	0%	0%	0%	-5%		27%
Charter boat trips	82,310	83,390	83,390	83,390	83,390	76,930	64,600	83,390
Charter boat angler benefits	$5,926,320	$6,004,080	$6,004,080	$6,004,080	$6,004,080	$5,538,960	$4,651,200	$6,004,080
Net change in angler benefits		$77,760	$77,760	$77,760	$77,760	-$387,360		$1,352,880
Percent change in angler benefits		1%	1%	1%	1%	-7%		29%
Monterey[a]								
Private boat trips	89,070	89,070	89,070	89,070	89,070	84,890	56,040	89,070
Private boat angler benefits	$6,413,040	$6,413,040	$6,413,040	$6,413,040	$6,413,040	$6,112,080	$4,034,880	$6,413,040
Net change in angler benefits		$0	$0	$0	$0	-$300,960		$2,378,160
Percent change in angler benefits		0%	0%	0%	0%	-5%		59%
Charter boat trips	43,710	43,710	43,710	43,710	43,710	40,610	27,500	43,710
Charter boat angler benefits	$3,147,120	$3,147,120	$3,147,120	$3,147,120	$3,147,120	$2,923,920	$1,980,000	$3,147,120
Net change in angler benefits		$0	$0	$0	$0	-$223,200		$1,167,120
Percent change in angler benefits		0%	0%	0%	0%	-7%		59%
Totals for All Regions								
Total trips	591,820	674,570	670,320	654,130	651,650	526,780	435,300	670,320
Total angler benefits	$42,179,040	$48,568,320	$48,261,960	$47,096,640	$46,918,080	$37,927,800	$31,225,320	$48,261,960

[a]For Oregon ports, only one model for predicting the number of boat (both private and charter) trips taken by sportfishers was available; for California ports, separate models for predicting trips taken by charter and private boats were available for analyzing benefits of ocean sportfishing activity.

TABLE 3-24
Special-status Plant Species Occurring or Potentially Occurring in Riparian, Wetland, and Riverine Habitat along the Trinity and Lower Klamath Rivers

Common Name	Scientific Name	Status		
		CNPS	CA	Federal
Rattan's milk-vetch[a]	*Astragalus rattanii* var. *rattanii*	4	C	C
Bottlebrush sedge[a]	*Carex histricina*	2	C	C
Fox sedge	*Carex vulpinoidea*	2	C	C
California lady's-slipper[a]	*Cypripedium californicum*	4	C	C
Clustered lady's-slipper[a]	*Cypripedium fasciculatum*	4	C	FSC
Heckner's lewisia[a]	*Lewisia cotyledon* var. *heckneri*	1B	C	FSC
Showy raillardella[a]	*Raillardella pringlei*	1B	C	FSC
Great burnet[a]	*Sanguisorba officinalis*	2	C	C
English peak greenbriar[a]	*Smilax jamesii*	1B	C	C

[a]Known to occur in the general area of the project.

Status Definitions:
CNPS California Native Plant Society
1B Plants considered rare, threatened, or endangered ~~throughout their range~~ in California and elsewhere
2 Plants considered rare, threatened, or endangered in California, but more common elsewhere
4 Plants of limited distribution
FSC ***Federal Species of Concern***

TABLE 3-25
Special-status Plant Species Potentially Occurring in the Central Valley

Common Name	Scientific Name	Status		
		CNPS	CA	Federal
Suisun marsh aster	*Aster lentus*	1B	C	FSC
Fox sedge	*Carex vulpinoidea*	2	C	C
Suisun thistle	*Cirsium hydrophilum* var. *hydrophilum*	1B	C	FE
Soft bird-s beak	*Cordylanthus mollis* ssp. *mollis*	1B	CR	FE
Silky cryptantha	*Crypthantha crinita*	1B	C	FE
Rose-mallow	*Hibiscus lasiocarpus*	2	C	C
Northern California black walnut	*Juglans californica* var. *hindsi*	1B	C	FSC
Mason-s lilaeopsis	*Lilaeopsis masoni*	1B	CR	FSC
Delta mudwort	*Limosella subulata*	2	C	C
Eel-grass pondweed	*Potamogeton zosteriformes*	2	C	C
Sandford-s arrowhead	*Sagittaria sanfordii*	1B	C	FSC

Status Definitions:
FE Listed and endangered under federal Endangered Species Act
FSC Federal Species of Concern
CR Considered as rare by the State of California
CNPS California Native Plant Society
1B ~~List 1B species:~~ Plants considered rare, threatened, or endangered in California and elsewhere ~~throughout their range~~
2 ~~List 2 species:~~ Plants considered rare, threatened, or endangered in California, but more common elsewhere

TABLE 3-32
Preferred Recreation Flow Ranges/Thresholds[a]

Activity	Preferred Flow Ranges (cfs)
Canoeing	200-1,500
Drift-boat and drift-raft fishing	200-1,500
White-water activities (i.e., kayaking, canoeing, and rafting)	~~300~~450-8,000
Recreational mining	350-600
Shore fishing	300-800
Swimming/inner-tubing	150-800
Wading	300-800
Campground Use Precluded	**Flow Threshold**
Steel Bridge, Douglas City	8,000 or greater
Steiner Flat, North Fork	10,000 or greater
Poker Bar	12,000 or greater

[a]Trinity River flows in the Preferred Flow/Threshold range during the primary recreation season (Memorial Day to Labor Day) as measured at the Lewiston gage.

TABLE 3-33
Riverine Recreation Opportunities – Trinity River

		Recreation Opportunity Constraints During the Primary Recreation Season[a, b]					
Resource Concern	**Preferred Flow Range (cfs)**	**No Action/Existing Conditions**	**Maximum Flow**	**Flow Evaluation**	**Percent Inflow**	**Mechanical Restoration**	**State Permit**
Canoeing	200-1,500	No constraint[c]	Constrained 8 weeks in **extremely wet** and **wet** years. Constrained 6 weeks in **normal** and **dry** years. Constrained 5 weeks in **critically dry** years.	Constrained 7 weeks in **extremely wet**, **wet** years and **normal** years. Constrained 1 week in **dry** years. Not constrained during **critically dry** years.	Constrained 8 weeks in **extremely wet**, **wet**, **normal**, and **dry** years. Constrained 10 weeks in **critically dry** years.	No constraint	Constrained 15 weeks (the entire primary recreation season) in **all** water-year classes.
Camping							
Steel Bridge, Douglas City	8,000 or less	No constraint	No constraint	Constrained 1 week in **extremely wet** years.	No constraint	No constraint	No constraint
Steiner Flat, North Fork	10,000 or less	No constraint	No constraint	No constraint	No constraint	No constraint	No constraint
Poker Bar	12,000 or less	No constraint	No constraint	No constraint	No constraint	No constraint	No constraint
Drift-boat fishing	300-1,500	No constraint	Constrained 8 weeks in **extremely wet** and **wet** years. Constrained 6 weeks in **normal** and **dry** years. Constrained 5 weeks in **critically dry** years.	Constrained 7 weeks in **extremely wet**, **wet** and **normal** years. Constrained 1 week in **dry** years. Not constrained during **critically dry** years.	Constrained 9 weeks in **extremely wet, wet** and **normal** years. Constrained 10 weeks during **dry** years. Constrained 12 weeks during **critically dry** years.	No constraint	Constrained 15 weeks (the entire primary recreation season) in **all** water-year classes.
Drift-raft fishing	200-1,500	No constraint	Constrained 8 weeks in **extremely wet** and **wet** years. Constrained 6 weeks in **normal** and **dry** years. Constrained 5 weeks in **critically dry** years.	Constrained 7 weeks in **extremely wet**, **wet** and **normal** years. Constrained 1 week in **dry** years. Not constrained during **critically dry** years.	Constrained 8 weeks in **extremely wet, wet, normal,** and **dry** years. Constrained 10 weeks in **critically dry** years.	No constraint	Constrained 15 weeks (the entire primary recreation season) in **all** water-year classes.
White-water (i.e., kayaking, canoeing, and rafting)	~~300~~450-8,000	No constraint	No constraint	Constrained 1 week in extremely **wet** years.[d] Not constrained in wet, normal, dry, and critically dry years.	Constrained ~~4~~ 6 weeks in **extremely wet** years. Constrained ~~7~~ 9 weeks in **wet** years. Constrained ~~9~~ 10 weeks in **normal** years. Constrained ~~10~~ 11 weeks in **dry** years. Constrained ~~12~~ 14 weeks in **critically dry** years.	No constraint	Constrained 15 weeks (the entire primary recreation season) in **all** water-year classes.
Recreational mining	350-600	Constrained 3 weeks in **all** water-year classes.	Constrained 10 weeks in **extremely wet** years. Constrained 15 weeks (entire recreation season) in **wet, normal, dry,** and **critically dry** years.	Constrained 8 weeks in **extremely wet**, **wet**, and **normal** years. Constrained 3 weeks in **dry** and **critically dry** years.	Constrained 13 weeks in **extremely wet**, **wet**, **dry**, and **critically dry** years. Constrained 14 weeks in **normal** years.	Constrained 3 weeks in **all** water-year classes.	Constrained 15 weeks (the entire primary recreation season) in **all** water-year classes.

TABLE 3-33
Riverine Recreation Opportunities – Trinity River

		Recreation Opportunity Constraints During the Primary Recreation Season[a, b]					
Resource Concern	**Preferred Flow Range (cfs)**	**No Action/Existing Conditions**	**Maximum Flow**	**Flow Evaluation**	**Percent Inflow**	**Mechanical Restoration**	**State Permit**
Swimming/inner-tubing	150-800	Constrained 2 weeks in **all** water-year classes.	Constrained 9 weeks in **extremely wet** years. Constrained 11 weeks in **wet** years. Constrained 8 weeks in **normal** and **dry** years. Constrained 15 weeks (entire recreation season) in **critically dry** years.	Constrained 7 weeks in **extremely wet**, **wet**, and **normal** years. Constrained 3 weeks in **dry** and **critically dry** years.	Constrained 9 weeks in **extremely wet** years and **dry** years. Constrained 10 weeks in **wet, normal** and **critically dry** years.	Constrained 2 weeks in **all** water-year classes.	No constraint
Shore fishing	300-800	Constrained 2 weeks in **all** water-year classes.	Constrained 9 weeks in **extremely wet** years. Constrained 11 weeks in **wet** years. Constrained 8 weeks in **normal** and **dry** years. Constrained 15 weeks in **critically dry** years.	Constrained 7 weeks in **extremely wet**, **wet**, and **normal** years. Constrained 3 weeks in **dry** and **critically dry** years.	Constrained 12 weeks in **all** water-year classes.	Constrained 2 weeks in **all** water-year classes.	Constrained 15 weeks (the entire primary recreation season) in **all** water-year classes.
Wading	300-800	Constrained 2 weeks in **all** water-year classes.	Constrained 9 weeks in **extremely wet** years. Constrained 11 weeks in **wet** years. Constrained 8 weeks in **normal** and **dry** years. Constrained 15 weeks in **critically dry** years.	Constrained 7 weeks in **extremely wet**, **wet**, and **normal** years. Constrained 3 weeks in **dry** and **critically dry** years.	Constrained 12 weeks in **all** water-year classes.	Constrained 2 weeks in **all** water-year classes.	Constrained 15 weeks (the entire primary recreation season) in all water-year classes.

[a]See Recreation Resources Technical Appendix D for more specific information about weekly flows impacts to recreation opportunities.

[b]The primary recreation season is defined as Memorial Day to Labor Day (approximately the last week in May to the end of the first week in September).

[c]Flows within preferred range during the entire primary recreation season for all year classes.

[d]White-water kayaking and rafting are constrained during the last week of May during the extremely wet water-year class when the Trinity River flows exceed the upper preferred threshold of 8,000 cfs. In general, however, those who prefer flows on the higher end of the preferred range would experience improved conditions compared to No Action.

TABLE 3-36
Summary of Impacts to Trinity, Shasta, and Folsom Reservoir Recreation Opportunities

	Projected Recreation Facility Availability During the Recreation Season[a]												
	No Action	**Maximum Flow**	**Percent Change**	**Flow Evaluation**	**Percent Change**	**Percent Inflow**	**Percent Change**	**Mechanical Restoration**	**Percent Change**	**State Permit**	**Percent Change**	**Existing Conditions**	**Preferred Alternative Percent Change from Existing Conditions**
Facility and Threshold Elevation (msl)													
Trinity Reservoir													
Stuart Fork Ramps (2,320)	~~42~~ 45	9	~~-33~~ -36	42	~~0~~ -3	41	~~-1~~ -4	~~42~~ 45	0	56	~~14~~ 11	46	4
Fairview Ramp & Major Marina Relocations Required (2,310)	~~52~~ 52	18	~~-34~~ -36	52	~~0~~ -2	50	~~-2~~ -4	~~52~~ 54	0	62	~~10~~ 8	55	3
Trinity Center Ramp (2,295)	~~62~~ 63	35	~~-27~~ -28	63	~~1~~ 0	59	~~-3~~ -4	~~62~~ 63	0	72	~~10~~ 9	63	1
Campground Use (2,270)	~~74~~ 78	64	~~-10~~ -14	79	~~5~~ 1	80	~~6~~ 2	~~74~~ 78	0	84	~~10~~ 6	80	6
Minersville Ramp (2,170)	~~99~~ 100	99	~~0~~ -1	100	~~1~~ 0	100	~~1~~ 0	~~99~~ 100	0	100	~~1~~ 0	100	1
Shasta Reservoir													
McCloud Arm Ramps (952)	92	89	-3	90	-2	90	-2	92	0	92	0	93	1
Sacramento Arm Ramps (950)	92	89	-3	91	-1	92	0	92	0	92	0	94	2
Sacramento Arm Marina (937)	93	89	-4	93	0	94	1	93	0	94	1	95	2
Pit Arm Ramps (907)	98	93	-5	96	-2	98	0	98	0	99	1	98	0
Centimudi Ramp (844)	100	97	-3	100	0	100	0	100	0	100	0	100	0
Folsom Reservoir													
Last boat ramp out of operation (360)	98	99	1	98	0	98	0	98	0	98	0	99	1
Limited lake surface area (boating constrained at 400)	87	89	-10	83	-4	86	-1	87	0	89	2	89	2
Marina closes (405)	80	82	-8	76	-4	79	-1	80	0	83	3	82	2
Decline in campground/picnicking use (430)	56	56	-3	53	-3	54	-2	56	0	55	-1	56	0
Beach area inundated (450)	31	32	-2	30	-1	30	-1	31	0	31	0	32	1

[a]The primary recreation season is defined as approximately Memorial Day to Labor Day.

TABLE 3-37
Summary of Impacts to Reservoir Use and Benefits[a]

	No Action	Maximum Flow		Flow Evaluation		Percent Inflow		Mechanical Restoration	State Permit		Existing Conditions[b]	
Resource Concern		**Amount**	**Percent Change from No Action**	**Amount**	**Percent Change from No Action**	**Amount**	**Percent Change from No Action**		**Amount**	**Percent Change from No Action**	**Amount**	**Preferred Alternative Percent Change from Existing Conditions**
Trinity Reservoir												
Recreation Benefits[c] (million $)	~~8.7~~ 8.8	8.4	~~-4~~ -5	~~8.7~~ 8.8	1 0	8.8	~~2~~ 1	Same as No Action	9.2	~~6~~ 5	5.3	66
Visitor Days	~~796,200~~ 803,600	766,200	~~-4~~ -5	802,800	~~1~~ 0	809,700	~~2~~ 1	Same as No Action	841,000	~~6~~ 5	484,900	66
Shasta Reservoir												
Recreation Benefits (million $)	61.9	56.9	-8	60.9	-2	61.8	0	Same as No Action	63.1	2	38.0	60
Visitor Days	5,682,700	5,216,500	-8	5,583,400	-2	5,673,600	0	Same as No Action	5,786,800	2	3,483,100	60

[a] Long-term average water conditions only.
[b] 1995 existing conditions.
[c] All benefits are expressed in 1997 dollars.

Notes:
Impacts shown for long-term average water conditions only. See Recreational Technical Appendix D for dry water conditions.

TABLE 3-38
Trinity, Shasta, and Folsom Reservoir Recreation Opportunities, Use, and Benefits [a,b]

	Recreation Facility Availability During the Recreation Season											
	Existing Conditions	No Action	Maximum Flow		Flow Evaluation		Percent Inflow		Mechanical Restoration		State Permit	
	Facility Availability (Percentage)	Facility Availability (Percentage)	Facility Availability (Percentage)	Percent Change from No Action	Facility Availability (Percentage)	Percent Change from No Action	Facility Availability (Percentage)	Percent Change from No Action	Facility Availability (Percentage)	Percent Change from No Action	Facility Availability (Percentage)	Percent Change from No Action
Trinity Reservoir												
Stuart Fork Ramps (2,320 msl)	46	~~42~~ 45	9	~~-33~~ -36	42	~~0~~ -3	41	~~-1~~ -4	42 45	0	56	~~14~~ 11
Fairview Ramp & major marina relocations (2,310 msl)	55	~~52~~ 54	18	~~-34~~ -36	52	~~0~~ –2	50	~~-2~~ –4	52 54	0	62	~~10~~ 8
Trinity Center Ramp (2,295 msl)	63	~~62~~ 63	35	~~-27~~ -28	63	~~1~~ 0	59	~~-3~~ -4	62 63	0	72	~~10~~ 9
Campground use (2,270 msl)	80	~~74~~ 78	64	~~-10~~ -14	79	~~5~~ +1	80	~~6~~ +2	74 78	0	84	~~10~~ 6
Minersville Ramp (2,170 msl)	100	~~99~~ 100	99	~~0~~ -1	100	~~1~~ 0	100	~~1~~ 0	99 100	0	100	~~1~~ 0
Shasta Reservoir												
McCloud Arm Ramps (952 msl)	93	92	89	-3	90	-2	90	-2	92	0	92	0
Sacramento Arm Ramps (950 msl)	94	92	89	-3	91	-1	92	0	92	0	92	0
Sacramento Arm Marina (937 msl)	95	93	89	-4	93	0	94	1	93	0	94	1
Pit Arm Ramps (907 msl)	98	98	93	-5	96	-2	98	0	98	0	99	1
Centimudi Ramp (844 msl)	100	100	97	-3	100	0	100	0	100	0	100	0
Folsom Reservoir												
Last boat ramp out of operation (360 msl)[c]	99	98	95	-3	98	0	98	0	98	0	98	0
Limited lake surface area (boating constrained at 400 msl)	89	87	77	-10	83	-4	86	-1	87	0	89	2
Marina closes (405 msl)	82	80	72	-8	76	-4	79	-1	80	0	83	3
Decline in campground/picnicking use (430 msl)	56	56	53	-3	53	-3	54	-2	56	0	55	-1
Beach area inundated (450 msl)	32	31	29	-2	30	-1	30	-1	31	0	31	0

	Estimated Annual Recreation Use and Change in Benefits Compared to No Action												
	Existing Conditions	No Action	Maximum Flow		Flow Evaluation			Percent Inflow		Mechanical Restoration		State Permit	
			Amount	Percent Change from No Action	Amount	Percent Change from No Action	Percent Change from Existing Conditions	Amount	Percent Change from No Action	Amount	Percent Change from No Action	Amount	Percent Change from No Action
Trinity Reservoir													
Recreations Benefits (million $)	5.3	~~8.7~~ 8.8	8.4	~~-4~~ -5	8.8	~~1~~ 0	66	8.8	~~2~~ 1	~~8.7~~ 8.8	0	9.2	~~6~~ 5
Visitor Days[d]	484,900	~~796,200~~ 803,600	766,200	~~-4~~ -5	802,800	~~1~~ 0	66	809,700	~~2~~ 1	~~796,200~~ 803,600	0	841,000	~~6~~ 5
Shasta Reservoir													
Recreations Benefits (million $)	38.0	61.9	56.9	-8	60.4	-2	60	61.8	0	61.9	0	63.1	2
Visitor Days	3,483,100	5,682,700	5,216,500	-8	5,583,400	-2	60	5,673,600	0	5,682,700	0	5,786,800	2

[a] Estimated annual recreation use and change in benefits were identified for only Trinity and Shasta Reservoirs given they were assumed to be the reservoirs most directly affected by the change in Trinity and Shasta Division operations.
[b] Long-term average water conditions.
[c] Data Source: Draft PEIS. U.S. Bureau of Reclamation, 1997.
[d] Number of recreation visitor days (RVDs).

TABLE 3-46
Property Value Impact Ranking Summary

		Compared to the No Action Alternative					Compared to Existing Conditions	
Locations/Measures	**No Action**	**Maximum Flow**	**Flow Evaluation**	**Percent Inflow**	**Mechanical Restoration**	**State Permit**	**Existing Conditions**	**Preferred Alternative**
Trinity Reservoir Rankings								
Short-term Annual Average								
Water level	~~2,298~~ 2,302	2,284	2,303	2,301	~~2,298~~ 2,302	2,311	2,302	2,303
Change in water level		~~-14~~ -18	~~+5~~ +1	~~+3~~ -1	0	~~+13~~ +9		+1
NEPA rank	~~(4)~~ (3)	(5)	(2)	~~(3)~~ (4)	~~(4)~~ (3)	(1)		
Long-term Annual Range								
Water level	~~159~~ 155	102	123	125	~~159~~ 155	151	154	123
Change in water level		~~-57~~ -53	~~-36~~ –32	~~-34~~ -30	0	~~-8~~ –4		-31
NEPA rank	(5)	(1)	(2)	(3)	(5)	(4)		
Monthly Range								
Water level	~~61~~ 66	36	60	62	~~61~~ 66	64	66	60
Change in water level		~~-25~~ -30	~~-1~~ –6	~~+1~~ -4	0	~~+3~~ –2		-6
NEPA rank	~~(3)~~ (5)	(1)	(2)	~~(4)~~ (3)	~~(3)~~ (5)	~~(5)~~ (4)		
Overall Rank:	~~4~~ 5	**2**	**1**	~~3~~ 4	~~4~~ 5	**3**	**n/a**	**n/a**
Shasta Reservoir Rankings:								
Short-term Annual Average								
Water level	1,016	1,006	1,013	1,015	1,016	1,018	1,018	1,013
Change in water level		-10	-3	-1	0	+2		-5
NEPA rank	(2)	(5)	(4)	(3)	(2)	(1)		
Long-term Annual Range								
Water level	109	193	125	111	109	111	108	125
Change in water level		+84	+16	+2	0	+2		+17
NEPA rank	(1)	(4)	(3)	(2)	(1)	(2)		
Monthly Range								
Water level	67	86	88	67	67	65		
Change in water level		+19	+21	0	0	-2	65	88
NEPA rank	(2)	(3)	(4)	(2)	(2)	(1)		+23
Overall Rank:	**2**	**5**	**4**	**3**	**2**	**1**	**n/a**	**n/a**
~~**River Rankings**~~								
~~Fish harvest~~	~~1,820~~	~~18,200~~	~~15,100~~	~~5,250~~	~~3,830~~	~~0~~	~~1,820~~	~~15,100~~
~~Change in harvest~~		~~+16,380~~	~~+13,280~~	~~+3,430~~	~~+2,010~~	~~-1,820~~		~~+13,280~~
~~NEPA rank~~	~~(5)~~	~~(1)~~	~~(2)~~	~~(3)~~	~~(4)~~	~~(6)~~	~~n/a~~	~~n/a~~

[a] Change in annual inriver natural harvest of chinook, coho, and steelhead fish populations.

TABLE 3-49
Power Resources Summary Table

CVP Operations		No Action	Percent Change from the No Action Alternative: Maximum Flow	Flow Evaluation	Percent Inflow	Mechanical Restoration	State Permit	Percent Change from Preferred Alternative: Existing Conditions	Existing Condition Percent Change Compared to Preferred Alternative
Operations									
Capacity (MW)	Average (1922-199~~09~~)	1,603	-2%	0%	0%	0%	4%	1,668.50	-4%
	Dry (1928-1934)	~~1,276~~ 1,334	~~-10~~ -8%	~~-2~~ -1%	1%	0%	~~11~~ 9%	1,394.08	-10%
	Wet (1967-1971)	1,766	-2%	0%	~~0~~ -2%	0%	0%	1,778.00	-1%
Energy (GWh)[a]	Average (1922-199~~09~~)	5,169	-21%	-6%	-3%	0%	4%	5,217.00	-6%
	Dry (1928-1934)	~~2,946~~ 3,300	-25%	-7%	~~1~~ -1%	0%	~~0~~ 7%	2,985.00	-8%
	Wet (1967-1971)	6,490	-20%	-7%	-5%	0%	3%	6,525.00	-8%
Project Use (GWh)	Average (1922-199~~09~~)	1,394	-11%	-2%	0%	0%	1%	1,401.00	-3%
	Dry (1928-1934)	~~901~~ 990	~~-10~~ -13%	~~-6~~ -5%	0%	0%	~~8~~ 6%	882.00	-4%
	Wet (1967-1971)	1,502	0%	1%	0%	0%	0%	1,519.00	0%
Power Marketing									
Average Year Energy Available for Sale by Month (GWh)	January	192	-7%	-2%	-3%	0%	6%	201	-6%
	February	212	1%	-1%	-3%	–	6%	222	-6%
	March	235	-1%	-4%	-4%	–	4%	240	-6%
	April	300	-4%	-7%	-1%	–	3%	309	-10%
	May	473	-22%	-10%	-10%	–	3%	474	-10%
	June	541	-27%	-16%	-10%	–	2%	535	-15%
	July	609	-31%	-7%	-6%	–	4%	609	-7%
	August	492	-33%	-2%	2%	–	6%	491	-2%
	September	234	-34%	17%	12%	–	25%	236	-16%
	October	187	-58%	-22%	-10%	–	6%	194	-24%
	November	127	-41%	-13%	-5%	–	8%	131	16%
	December	176	-30%	-8%	-2%	–	7%	182	-10%
	TOTAL	3,779	-24%	-7%	-4%	0%	6%	3,825	-8%
Synthetic Dry-year Firm Load-carrying Capacity (MW)	Capability available for sale	1,229	-16%	3%	-3%	–	-2%	1,167	9%
	Generation-limited months per year with 50 MW reduction	None	6	1	2	–	–	1	–
Cost (or benefits) of Changes in Power Production Based on Value of Replacement Power ($1,000)	Bay Area	40.3%	-$10,493	-$2,242	-$2,830	–	$2,393	$1,397	~~1,397~~ -$3,639
	Other	4.2%	-$1,093	-$234	-$295	–	$249	$146	~~146~~ -$379
	Sacramento Valley	45.5%	-$11,850	-$2,532	-$3,196	–	$2,702	$1,577	~~1,577~~ -$4,110
	San Joaquin Valley	8.8%	-$2,280	-$487	-$615	–	$520	$303	~~303~~ -$791
	Trinity County	1.2%	-$321	-$69	-$87	–	$73	$43	~~43~~ -$111
	TOTAL	100.0%	-$26,037	-$5,564	-$7,023	–	$5,937	$3,466	~~3,466~~ -$9,029
Change in Cost per Unit of Electricity ($/MWh)	Average customer	–	$0.96	$0.21	$0.26	–	-$0.22	~~-$0.33~~	~~$.54~~ -$0.33
	High-allocation customer	–	$5.86	$1.25	$1.58	–	-$1.34	~~-$3.90~~	~~$5.15~~ -$3.90

[a]GWh = gigawatt hour.

TABLE 3-54
Trinity River Basin Region (Defined as Trinity County for Up-front Impacts, and Trinity and Shasta Counties for Annual Impacts ~~These Analyses~~)

Time of Impact/ Impact Measures/ Economic Sectors	Units	Comparison Bases		Action Alternatives						
		Existing Conditions	No Action Alternative	Maximum Flow	Flow Evaluation	Percent Inflow	Mechanical Restoration	State Permit	Preferred Alternative	
				Change from No Action Alternative in 2020						Change from Existing Conditions
Up-front Impacts		**Year 1995 Totals**	**Year 2001 Totals**							
Output/Sales	M$	344.2	350.6	6.2/5.5/3.6[a]	1.28	1.23	2.14	0	2.14	8.54
Income	M$	186.1	189.5	2.95/2.65/1.75[a]	0.66	0.63	1.11	0	1.10	4.5
Employment	Jobs	4,955	5,045	77/70/45[a]	22	21	37	0	37	127
Most Impacted Sectors:										
Construction	Jobs	375	380	18/16/11	0	0	0	0	0	5
Wholesale trade	Jobs	105	105	7/6/4[a]	1	1	2	0	2	2
Eating & drinking	Jobs	225	230	8/7/4[a]	3	3	5	0	5	10
Auto & service stations	Jobs	55	55	11/10/6[a]	0	0	0	0	0	0
Annual Impacts		**Year 1995 Totals**	**Year 2020 Totals**							
Output/Sales	M$	6,078.2	8,693.7	~~6.3~~ -6.6	~~3.2~~ 3.0	~~0.5~~ -0.8	~~0.11~~ 0.13	~~5.9~~ -6.2	~~3.2~~ 3.0	~~2,618.7~~ 2,618.5
Income	M$	3,377.4	4,830.7	~~2.6~~ -2.7	~~2.0~~ 1.8	~~0.3~~ -0.4	~~0.06~~ 0.07	~~3.5~~ -3.6	~~2.0~~ 0.8	~~1,455.3~~ 1,455.1
Employment	Jobs	83,280	119,110	-66 -70	66 62	-8 -12	2	-115 -119	66 62	35,896 35,892
Most Impacted Sectors:										
Wholesale trade	Jobs	4,900	7,010	-9	2	-1	0	-4	2	2,112
Retail trade	Jobs	15,880	22,710	~~-25~~ -26	~~21~~ 20	~~-3~~ -4	1	~~-38~~ -39	~~21~~ 20	~~6,851~~ 6,850
Lodging places	Jobs	1,440	2,060	~~-5~~ -6	~~20~~ 19	~~-1~~ -2	1	~~-32~~ -33	~~20~~ 19	~~640~~ 639

[a]Three estimates reflect dam modification options. See Section 2.1.3.
M$ = million dollars.

TABLE 3-55
Lower Klamath River Basin/Coastal Area Regions

Impact Subregion/Impact Measures/Economic Sectors	Units	Comparison Bases		Action Alternatives						
		Existing Conditions (1995)	No Action Alternative (2020)	Maximum Flow	Flow Evaluation	Percent Inflow	Mechanical Restoration	State Permit	Preferred Alternative	
				Change from No Action Alternative in 2020						Change from Existing Conditions
Monterey Coastal Area										
Total output	M$	34,214.6	51,714.2	0	0	0	0	-13.3	0	17,499.6
Income	M$	19,297.0	29,166.8	0	0	0	0	-5.4	0	9,869.8
Employment	Jobs	473,210	715,190	0	0	0	0	-166	0	241,980
Most Impacted Sectors:										
Commercial fishing	Jobs	210	210	0	0	0	0	-27	0	0
Seafood processing	Jobs	2,450	2,450	0	0	0	0	-57	0	0
Wholesale trade	Jobs	18,920	28,600	0	0	0	0	-8	0	9,680
Retail trade	Jobs	77,010	116,390	0	0	0	0	-24	0	39.380
Lodging places	Jobs	12,390	18,720	0	0	0	0	-2	0	6,330
San Francisco Coastal Area										
Total output	M$	351,700	430,900	-159.6	-32.6	-12.3	2.28	13.2	-32.6	79,167
Income	M$	199,900	245,000	-79.2	-16.2	-6.4	0.91	7.9	-16.2	45,084
Employment	Jobs	3,652,600	4,560,500	-1,540	-310	-120	25	110	-310	907,590
Most Impacted Sectors:										
Vegetables	Jobs	1,423	1,776	-165	-1	-9	0	27	-1	352
Canned fruit and vegetables	Jobs	3,281	4,097	-125	-24	-7	0	21	-24	792
Retail and wholesale trade	Jobs	746,600	932,218	-327	-65	-30	6	21	-65	185,553
Services	Jobs	1,154,925	1,441,977	-420	-85	-41	6	38	-85	286,967
Commercial Fishing	Jobs	1,276	1,593	3	0	-3	3	-20	0	317
Mendocino Coastal Area										
Total output	M$	3,111.5	4,267.1	11.1	9.6	4.9	4.3	-2.1	9.6	1,165.2
Income	M$	1,560.4	2,140.0	5.1	4.4	2.3	2.0	-1.0	4.4	584.0
Employment	Jobs	43,630	59,835	127	110	57	50	-25	110	16,315

TABLE 3-55
Lower Klamath River Basin/Coastal Area Regions

Impact Subregion/Impact Measures/Economic Sectors	Units	Comparison Bases		Action Alternatives						
		Existing Conditions (1995)	No Action Alternative (2020)	Maximum Flow	Flow Evaluation	Percent Inflow	Mechanical Restoration	State Permit	Preferred Alternative	
				Change from No Action Alternative in 2020						Change from Existing Conditions
Most Impacted Sectors:										
Commercial fishing	Jobs	180	180	33	29	14	13	-5	29	29
Seafood processing	Jobs	180	180	31	27	13	12	-5	27	27
Wholesale trade	Jobs	1,360	1,870	6	5	3	2	-1	5	515
Retail trade	Jobs	8,130	11,150	18	15	8	7	-5	15	3,035
Lodging places	Jobs	1,710	2,350	2	2	1	1	-1	2	642
KMZ-California Coastal Area										
Total Output	M$	5,086.9	6,072.5	3.0	2.9	2.0	1.9	-0.3	2.9	988.5
Income	M$	2,752.4	3,285.7	1.5	1.5	1.0	0.9	-0.2	1.5	534.8
Employment	Jobs	73,760	88,050	37	36	24	23	-4	36	14,326
Most Impacted Sectors:										
Commercial fishing	Jobs	520	520	8	7	5	5	-1	7	7
Seafood processing	Jobs	460	460	7	6	4	4	-1	6	6
Wholesale trade	Jobs	3,210	3,830	2	2	2	1	0	2	622
Retail trade	Jobs	13,820	16,490	8	8	5	5	-1	8	2,678
Lodging places	Jobs	1,390	1,650	2	2	1	1	0	2	262
KMZ-Oregon Coastal Area										
Total Output	M$	572.4	848.4	3.9	3.7	2.8	2.6	-0.5	3.7	279.7
Income	M$	289.9	429.7	1.7	1.6	1.2	1.0	-0.2	1.6	141.4
Employment	Jobs	9,100	13,490	62	58	45	43	-8	58	4,448
Most Impacted Sectors:										
Commercial fishing	Jobs	130	130	13	12	9	8	-1	12	12
Seafood processing	Jobs	110	110	9	8	6	6	-1	8	8
Wholesale trade	Jobs	330	490	4	3	3	3	0	3	163
Retail trade	Jobs	2,080	3,080	18	17	14	13	-3	17	1,017
Lodging places	Jobs	500	740	3	3	3	2	-1	3	243

TABLE 3-55
Lower Klamath River Basin/Coastal Area Regions

Impact Subregion/Impact Measures/Economic Sectors	Units	Comparison Bases		Action Alternatives						
		Existing Conditions (1995)	No Action Alternative (2020)	Maximum Flow	Flow Evaluation	Percent Inflow	Mechanical Restoration	State Permit	Preferred Alternative	
				Change from No Action Alternative in 2020						Change from Existing Conditions
Northern/Central Oregon Coastal Area										
Total output	M$	20,757.5	27,094.0	51.1	47.5	36.0	35.7	-41.8	47.5	6,384.0
Income	M$	10,549.2	13,768.8	19.3	17.9	13.6	~~15.4~~ 13.4	-15.8	17.9	3,237.5
Employment	Jobs	290,960	379,760	601	559	423	419	-494	559	89,559
Most Impacted Sectors:										
Commercial fishing	Jobs	900	900	109	102	77	74	-89	102	102
Seafood processing	Jobs	1,730	1,730	181	168	127	127	-147	168	168
Wholesale trade	Jobs	11,260	14,700	36	34	26	26	-30	34	3,474
Retail trade	Jobs	56,410	73,630	92	86	65	64	-77	86	17,306
Lodging places	Jobs	6,370	8,320	6	5	4	4	-5	5	1,955

M$ = million dollars.

TABLE 4-3A

Modeling Assumptions

	Pre-CVPIA	Bay-Delta WQCP	3406 (b)(2)	Preferred Alternative
Trinity River Minimum Instream Flow Requirement	340 taf annual minimum instream flow pattern all year classes	340 taf annual minimum instream flow pattern all year classes	340 taf annual minimum instream flow pattern all year classes	360-815 taf depending on year type
Sacramento River Operations	SWRCB Water Rights Orders 90-05 and 91-01; NMFS Winter-run Biological Opinion	SWRCB Water Rights Orders 90-05 and 91-01; NMFS Winter-run Biological Opinion	SWRCB Water Rights Orders 90-05 and 91-01; NMFS Winter-run Biological Opinion; Nov. 20, 1997, Administrative Paper Actions	SWRCB Water Rights Orders 90-05 and 91-01; NMFS Winter-run Biological Opinion; Nov. 20, 1997, Administrative Paper Actions
Delta Operations	SWRCB Decision 1485 and NMFS Winter-run Biological Opinion	NMFS Winter-run Biological Opinion and SWRCB Water Rights Order 95-06 (Bay-Delta Accord)	NMFS Winter-run Biological Opinion; SWRCB Water Rights Order 95-06 (Bay-Delta Plan Accord); Nov. 20, 1997, Administrative Paper Actions[a].	NMFS Winter-run Biological Opinion; SWRCB Water Rights Order 95-06 (Bay-Delta Plan Accord); Nov. 20, 1997, Administrative Paper Actions[a].
CVP Contract Allocations Ag/M&I/Refuges/ Water Rights	Ag minimum water deliveries can go to zero percent. M&I can go to 75 per-cent. Refuges cut like Ag. Water Rights only cut in critical year's deliveries to 75 percent.	Ag minimum water deliveries can go to zero percent. M&I can go to 50 per-cent. Water rights and refuges only cut in critical year's deliveries to 75 percent.	Ag minimum water deliveries can go to zero percent. M&I can go to 50 per-cent. Water rights and refuges only cut in critical year's deliveries to 75 percent.	Ag minimum water deliveries can go to zero percent. M&I can go to 50 per-cent. Water Rights and refuges only cut in critical year's deliveries to 75 percent.

[a]The 1999 3406(b)(2) decision required some accounting and post-processing; additional Delta actions were required to meet the 800 taf. Assumed restricted pumping that affected the south of Delta users.

TABLE 4-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		Water Resources	
Groundwater			
Maximum Flow Flow Evaluation Percent Inflow	Significant declines in groundwater levels could occur in the Sacramento Valley and Tulare Basin regions, primarily in areas receiving CVP agricultural service contract water.	Although changes to surface water supply *per se* were not considered an impact, the development of additional water supplies to meet demands would lessen the associated impacts (e.g., groundwater impacts). A number of demand- and supply-related programs are currently being studied across California, many of which are being addressed through the ongoing CALFED and CVPIA programs and planning processes. Although none of these actions would be directly implemented as part of the alternatives discussed in this DEIS/EIR, each could assist in offsetting impacts resulting from decreased Trinity River exports. Examples of actions being assessed in the CALFED and CVPIA planning processes include: • Develop and implement additional groundwater and/or surface-water storage. Such programs could include the construction of new surface reservoirs and groundwater storage facilities, as well as expansion of existing facilities. Potential locations include sites throughout the Sacramento and San Joaquin Valley watersheds, as well as the Delta. • Purchase long- and/or short-term water supplies from willing sellers (both in-basin and out-of-basin) through actions including, but not limited to, temporary or permanent land fallowing. • Facilitate willing buyer/willing seller inter- and intra-basin water transfers that derive supplies from activities such as conservation, crop modification, land fallowing, land retirement, groundwater substitution, and reservoir re-operation. • Promote and/or provide incentive for additional water conservation to reduce demand. • Decrease demand through purchasing and/or promoting the temporary fallowing of agricultural lands. • Increase water supplies by promoting additional water recycling.	Significant

TABLE 4-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
Maximum Flow Flow Evaluation Percent Inflow	The groundwater level declines could result in increased land subsidence within limited areas within the San Joaquin Valley and Tulare Basin regions.	See above.	Significant
Maximum Flow Flow Evaluation Percent Inflow	Additional groundwater pumping could result in upwelling of groundwater high in ~~TSD~~ TDS into productive groundwater zones within limited areas within the San Joaquin Valley and Tulare Basin regions.	See above.	Significant
		Water Quality	
Flow Evaluation Mechanical Restoration Percent Inflow	The channel rehabilitation projects would result in short-term Trinity River turbidity impacts.	• A 401 water quality certification would be obtained from the NCRWQCB, and a construction procedure would be developed to meet the Basin Plan turbidity requirements. Monitoring would be conducted as specified by the NCRWQCB, and efforts would be taken to reduce levels if they are 20 percent or more over background (e.g., isolating the work area and/or slowing or halting construction until the 20-percent level is achieved). • Notify individual diverters with state diversion permits within 2 miles downstream of any mechanical channel rehabilitation activity at least 2 days in advance of activities likely to produce turbidity.	Less than significant
Maximum Flow Flow Evaluation Percent Inflow	Violate temperature objectives and carryover storage criteria established in the Sacramento River winter run chinook salmon Biological Opinion.	Significant[a] impacts identified for the increased frequency of temperature and carryover storage violations ~~would need to be~~ were evaluated by ~~the~~ NMFS. ~~Such consultation could result in modification of the existing Biological Opinion. Given the result of this consultation is unknown, this significant impact is considered to be unmitigable at this time.~~ See mitigation for water quality fish-related impacts under Fishery Resources. (See also water supply related impacts under Groundwater.)	Significant[a]
Maximum Flow Percent Inflow State Permit	Violate state temperature objectives established for the Trinity River.	Significant impacts identified for violation of state temperature objectives would be evaluated by the NCRWQCB. Consultation with NMFS would occur pursuant to Trinity River coho salmon. Bypassing the Trinity Powerplant could offset impacts to temperature in the Trinity River. Preliminary analysis of powerplant bypasses indicates that pulling colder water from lower in the reservoir could alleviate temperature impacts. Further evaluation of the benefits and costs would be needed before a full assessment could be made. Given the result of consultations and bypass analysis is unknown, this significant impact is considered to be unmitigable at this time.	Significant

TABLE 4-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
Maximum Flow Percent Inflow State Permit	Violate Hoopa Valley Tribe temperature objectives established for the Trinity River.	Significant impacts identified for violation of tribal temperature objectives would be evaluated by the Hoopa Valley EPA. Consultation with NMFS would occur pursuant to Trinity River coho salmon. Bypassing the Trinity Powerplant could offset impacts to temperature in the Trinity River. Preliminary analysis of powerplant bypasses indicates that pulling colder water from lower in the reservoir could alleviate temperature impacts. Further evaluation of the benefits and costs would be needed before a full assessment could be made. Given the result of consultations and bypass analysis is unknown, this significant impact is considered to be unmitigable at this time.	Significant
		Fishery Resources	
Native Anadromous Species			
State Permit	Would affect native anadromous species utilizing the Trinity River due to inadequate habitat conditions and water temperature.	Anticipated significant impacts to native anadromous salmonids in the Trinity River from implementation of this alternative would be unmitigatable.	Significant
Maximum Flow Flow Evaluation Percent Inflow	Violate temperature objectives and carryover storage criteria established in the Sacramento River winter run chinook salmon Biological Opinion.	(See mitigation for water quality related impacts under Water Quality.) ~~Consult with NMFS and implement any required conservation measures. Given the result of this consultation is unknown, this significant impacts is considered to be unmitigable at this time.~~ Significant impacts requiring mitigation for adverse effects to anadromous salmonids in the Sacramento River system associated with Maximum Flow and Percent Inflow Alternatives would need to be addressed during reconsultation with NMFS. Significant impacts related to temperature objectives and carryover storage criteria established in the Sacramento River winter-run chinook salmon BO for the Flow Evaluation (Preferred Alternative) were addressed through reconsultation under ESA with NMFS. Per the NMFS' Biological Opinion (2000; under separate cover), implementation of the Preferred Alternative is not likely to jeopardize Southern Oregon/Northern California Coast (SONCC) coho salmon, Sacramento River winter-run chinook salmon, Central Valley spring-run chinook salmon, or Central Valley steelhead. The NMFS does anticipate that SONCC coho salmon habitat adjacent to and downstream of the channel rehabilitation projects associated with the Preferred Alternative may be temporarily degraded during construction. Construction of these projects, which will create a substantial amount of additional suitable habitat, may temporarily displace an unknown number of juvenile coho salmon but is not	Significant[a]

TABLE 4-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		expected to result in a lethal take. The NMFS does not anticipate that the implementation of the proposed action will incidentally take Central Valley spring-run chinook or Central Valley steelhead, but that the Preferred Alternative will result in a minute increase in the level of Sacramento River winter-run chinook incidentally taken in all years except critically dry years. In such years, Reclamation would be required to reinitiate consultation per the existing Winter-run Central Valley Project Operations Criteria and Plan to develop year-specific temperature control plans. Implementation of the following reasonable and prudent measures specified in the NMFS BO to minimize the effects of incidental take shall be non-discretionary and will result in minimizing impacts of incidental take of SONCC coho salmon and Sacramento River winter-run chinook salmon in all years including critically dry years: The Service and Reclamation shall: 1. Implement the flow regimes included in the proposed action (as described in the DEIS/EIR, page 2-19, Table 2-5) as soon as possible. 2. Ensure that NMFS is provided the opportunity to be represented during implementation of the Adaptive Environmental Assessment and Management program. 3. Ensure that the replacement bridges and other infrastructure modifications, needed to fully implement the proposed flow schedule, are designed and completed as soon as possible. 4. Periodically coordinate with NMFS during the advanced development and scheduling of the habitat rehabilitation projects described in the DEIS/EIR. 5. Complete “the first phase of the channel rehabilitation projects” (U.S. Fish and Wildlife Service and U.S. Bureau of Reclamation, 2000) in a timely fashion. 6. Implement emergency consultation procedures during implementation of flood control or “safety of dams” releases from Lewiston Dam to the Trinity River.	

TABLE 4-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		7. In dry and critically dry water-year classes, Reclamation and Service shall work cooperatively with the upper Sacramento River Temperature Task Group to develop temperature control plans that provide for compliance with temperature objectives in both the Trinity and Sacramento Rivers. Implementation of these measures will be non-discretionary.	
Resident Native and Non-native Fish			
State Permit	Increased water temperatures, which would reduce non-native Trinity River fish habitat.	Anticipated significant impacts to resident fish in the Trinity River from implementation of this alternative would be unmitigatable.	Significant
Maximum Flow Flow Evaluation Percent Inflow	Impacts to Delta smelt and Sacramento splittail as a result of changes in Delta inflow to export ratios.	~~Consult with Service and implement any required conservation measures. Given the result of this consultation is unknown, this significant impact is considered to be unmitigable at this time.~~ Significant impacts requiring mitigation related to changes in Delta inflow and export ratios associated with Maximum Flow and Percent Inflow Alternatives would need to be addressed during reconsultation with NMFS. Significant impacts related to changes in Delta inflow and export ratios for the Flow Evaluation (Preferred Alternative) were addressed through consultation under ESA with the Service. Per the Service's Biological Opinion (2000; under separate cover), implementation of the Preferred Alternative is not likely to jeopardize delta smelt and Sacramento splittail or adversely modify critical habitat for delta smelt. The Service has concurred with the determination that implementing the Preferred Alternative will not likely adversely affect the bald eagle and northern spotted owl. It is anticipated that delta smelt and Sacramento splittail will be adversely affected by implementing the Preferred Alternative and that incidental take may be affected in manner or extent not analyzed in the March 6, 1995 Biological Opinion on the Long-term Operation of the CVP and SWP. Therefore, the following reasonable and prudent measure to minimize the effects of incidental take was developed: 1. U.S. Bureau of Reclamation (Reclamation) shall minimize the effects of reoperating the Central Valley Project resulting from the implementation of the Preferred Alternative within the Trinity River Basin on listed fish in the Delta. Implementation of this measure will be non-discretionary.	Significant[a]

TABLE 4-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
Reservoirs			
Maximum Flow	Impacts to largemouth and smallmouth bass spawning in Trinity Reservoir due to reduced water surface levels.	A smallmouth and largemouth bass stocking program shall be instituted similar to the existing stocking program for coldwater species.	Less than significant
Ocean Fisheries Economics			
State Permit	Reduced angler benefits and net income of charter boat operators in the Mendocino Region.	No mitigation is available.	N/A
State Permit	Reduced commercial fishing harvests and related economic benefits.	No mitigation is available.	N/A
		Tribal Trust	
State Permit	Reduced flows would lead to further decline in tribal access to trust resources.	No mitigation is available.	Significant
		Vegetation, Wildlife, and Wetlands	
Vegetation			
Maximum Flow Flow Evaluation Percent Inflow Mechanical Restoration	Ground disturbing activities could result in a loss of vegetation and special-status plant populations.	Conduct site-specific environmental reviews prior to mechanical ground-disturbing activities. Such reviews shall, when appropriate, include surveys for federal and state endangered, threatened, and proposed species, or for other species if required by permitting agencies (e.g., USFS). If such species are present, actions shall be taken to avoid impacts. Develop and implement a revegetation plan for all ground-disturbing activities (excluding channel rehabilitation sites). Revegetation shall use plant species found adjacent to the impact area or from similar habitats, subject to land-owner and/or agency concurrence. Replacement ratios and monitoring plans, if determined necessary, will be developed in cooperation with the Corps, Service, and CDFG.	Less than significant
State Permit	Further degradation of riparian vegetation due to reduced flows.	No mitigation is available.	Significant
Wildlife			
Flow Evaluation Percent Inflow Mechanical Restoration	Direct mortality of foothill yellow-legged frogs or egg masses, adult western pond turtles and hatchlings, or willow flycatcher	Conduct site-specific environmental reviews prior to mechanical ground-disturbing activities. Such reviews shall, when appropriate, include surveys for federal and state endangered, threatened, and proposed species, or for	Less than significant

TABLE 4-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
	nests and young during construction (and maintenance for the Mechanical Restoration) of the channel rehabilitation sites.	other species if required by permitting agencies (e.g., USFS). If such species are present, actions shall be taken to avoid impacts (e.g., delay construction until after willow flycatcher chicks fledge).	
State Permit	Continued degradation and reduction of habitat as a result of reduced flows.	No mitigation is available.	Significant
Wetlands			
Flow Evaluation Percent Inflow Mechanical Restoration	The mechanical channel rehabilitation projects could impact wetland resources.	Conduct pre-construction delineation of wetland areas at sites that may contain wetlands. Consult with the Corps on potential impacts to wetland resources. No mitigation is available.	Less than significant
		Recreation	
Riverine			
Maximum Flow Flow Evaluation Mechanical Restoration State Permit Percent Inflow	Impacts from flows to a number of recreation activities for at least a portion of the recreation season.	Flow-related significant impacts would be unmitigable without changing the flow release schedule which is inherent to the alternative.	Significant
Maximum Flow Flow Evaluation State Permit Percent Inflow	Impacts to public safety from river flows that are too high or too low (i.e., outside the preferred range for boating).	Post signs at river access points showing daily flows. Offer a toll-free telephone number so recreationalists can call to obtain daily flow information. Post daily flows on the Internet.	Less than significant
Maximum Flow Flow Evaluation Percent Inflow Mechanical Restoration	Impacts to recreation activities from turbidity associated with the construction (and maintenance for Mechanical Restoration) of the channel rehabilitation sites.	(See mitigation for water quality related impacts under Water Quality.)	Less than significant
Reservoirs			
Maximum Flow Flow Evaluation	Increase the frequency at which Trinity Reservoir boat ramps are unusable, which would indirectly impact marinas and campgrounds.	All affected boat ramps should be extended a sufficient distance to accommodate the new water levels. Marina owners should be compensated for additional costs associated with moving their facilities or to construct new facilities to accommodate the new water levels. Campground facilities should be modified or funding provided to accommodate the revised operational approach.	Less than significant

TABLE 4-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		Land Use	
Residential/Municipal and Industrial			
Maximum Flow Flow Evaluation Percent Inflow	Increased flooding of Trinity River structures and/or residences.	Property owners could be compensated at fair market value for all flood-related structure/improvement losses incurred, or funding would be provided to retrofit structures/improvements to withstand peak flows. Property owners who have parcels with buildable sites outside of the current 100-year floodplain that would be regularly inundated could be compensated at fair market value for the loss of development rights to that parcel. Given funding for these efforts is not yet been determined, this significant impact is considered to be unmitigable at this time.	Significant
Maximum Flow	Potentially significant M&I related impacts as a result of decreased surface-water supplies.	(See water supply related impacts under Groundwater.)	Significant
Agriculture			
Maximum Flow Flow Evaluation	Substantially decrease irrigated acreage within the San Felipe Unit.	(See water supply related impacts under Groundwater.)	Significant
		Power	
Maximum Flow Flow Evaluation Percent Inflow	Potentially significant power-related impacts from decreased surface-water supplies.	(See water supply related impacts under Groundwater.) Power-related benefits associated with such programs would only occur if operations were conducted to provide increased generation; otherwise, implementation of such programs could negatively affect power resources). Operating criteria would be established to allow Western to respond to various emergency situations in accordance with their obligations to the North American Electric Reliability Council. This commitment would also provide for exemptions to a given alternative's operating criteria during search and rescue situations, special studies and monitoring, dam and powerplant maintenance, and spinning reserves. Such exemptions for responding to various emergency situations would be consistent with the Presidential Memorandum, dated August 3, 2000, directing federal agencies to work with the State of California to develop procedures governing the use of backup power generation in power shortage emergencies.	Significant

TABLE 4-4
Summary of Significant Adverse Environmental Impacts and Proposed Mitigation

DEIS/EIR Action Alternative	Description of Significant Impact	Mitigation	Level of Significance after Mitigation
		Cultural Resources	
Maximum Flow Flow Evaluation Percent Inflow Mechanical Restoration	Impacts to cultural resources.	Conduct cultural resource surveys of project areas (including areas of ancillary activities, such as staging areas, gravel mining areas, etc.) prior to ground disturbance. Areas containing cultural resources shall be demarcated and activities planned to avoid these areas. If cultural resources cannot be avoided, additional research or test excavations (as appropriate) will be undertaken to determine whether the resources meet CEQA and/or NRHP significance criteria. Unavoidable impacts on significant resources would be mitigated for in a manner that is deemed appropriate. Mitigation for significant resources may include, but is not limited to, data recovery, public interpretation, performance of a Historic American Building Survey or Historic American Engineering Record, or preservation by other means.	Less than significant
		Air Quality	
Maximum Flow Flow Evaluation Percent Inflow Mechanical Restoration	Spawning gravel placement and other heavy equipment work associated with the alternatives would result in potentially significant PM_{10} impacts as a result of fugitive dust.	Implement a dust control program, which includes: watering of stockpiles, roads, etc. as necessary, and identify an individual to monitor dust control and to respond to citizen complaints.	Less than significant

[a]These impacts were identified as “significant” per the CEQA-related significance threshold standards described in Chapter 3.