

D R A F T

February 16, 2001

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

DECISION _____ .

In the Matter of
**FISHERY RESOURCES AND WATER RIGHT
ISSUES OF THE LOWER YUBA RIVER**

Involving Water Right Permits 15026
15027, and 15030 Issued on
Applications 5632, 15204, and 15574
of Yuba County Water Agency,

Licenses 3984 and 3985 Issued on
Applications 9927 and 12371 of
Cordua Irrigation District

License 4443 Issued on
Application 9899 of Hallwood
Irrigation District, and

Other Water Diversions by Various
Parties Under Claim of Riparian Rights,
Pre-1914 Appropriative Rights,
and Contractual Rights.

SOURCE: Yuba River Tributary to Feather River

COUNTY: Yuba

**DECISION REGARDING PROTECTION OF FISHERY RESOURCES
AND OTHER ISSUES RELATING TO DIVERSION AND USE
OF WATER FROM THE LOWER YUBA RIVER**

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CITING THE RECORD¹

Citations to the hearing record are indicated as follows:

Citation to Reporter's Transcript:

Citations to the Reporters Transcript are indicated by "R.T." followed by a Roman numeral for the volume of the transcript where applicable, followed by the beginning page and line number and the ending page and line number.

Example: (R.T.V, 10:5-11:2.)

Citations for the transcript for the hearing in the year 2000 are preceded by an S.

Example: (S-R.T. 10:5-11:2.)

Citation to Exhibits:

Citations to exhibits in the evidentiary hearing record are designated by the name or abbreviation for the party submitting the exhibit, followed by the exhibit number, followed by the page number or other location of the cited information in the exhibit.

Example: Yuba County Water Agency Exh. 4, page 3 would be cited as (YCWA 4, p. 3.)

Citations for exhibits introduced at the hearing in the year 2000 are preceded by an S.

Example: (S-YCWA 4, p. 3.)

¹ Citations the hearing record are provided solely for ease of reference. There is often other supporting evidence in the record that is not specifically cited in the decision.

Abbreviations used for the parties or sources of information:

Brophy.....	Brophy Water District
Browns Valley.....	Browns Valley Water District
Cook.....	Mr. Walter Cook
Cordua.....	Cordua Irrigation District
CSPA.....	California Sportfishing Protection Alliance
DWR.....	California Department of Water Resources
DFG.....	California Department of Fish and Game
Hallwood.....	Hallwood Irrigation Co.
NMFS.....	National Marine Fisheries Service
PG&E.....	Pacific Gas & Electric Co.
Ramirez.....	Ramirez Water District
Sierra.....	Sierra Club, Motherlode Chapter
South Yuba.....	South Yuba Water District
SYRCL.....	South Yuba River Citizens League
SWRCB.....	State Water Resources Control Board
USFWS.....	U. S. Fish and Wildlife Service ¹
YCWA.....	Yuba County Water Agency
YG.....	YG Development Co., Western Aggregates, Inc., and Western Water Co.

¹ In the resumed hearing in 2000, the exhibits presented by witnesses for the U. S. Fish and Wildlife Service were submitted as exhibits of the Department of the Interior, abbreviated as DOI.

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**DECISION REGARDING PROTECTION OF FISHERY RESOURCES
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BY THE BOARD:

1.0 INTRODUCTION

This decision is the result of an extensive review and lengthy evidentiary hearing process that began following the State Water Resources Control Board's (SWRCB) receipt of a complaint on February 23, 1988, regarding fishery protection and water right issues on the lower Yuba River. The complaint was filed by a coalition of fishery groups referred to as the United Groups. The complainants' main contention is that the instream flow requirements specified in Yuba County

Water Agency's (YCWA) water right permits and the existing fish screening facilities do not provide an adequate level of protection for fishery resources in the lower Yuba River. The complainants also raised questions about the adequacy of several parties' water rights. The Division of Water Rights investigated the issues raised in the complaint, but did not finalize its report until August 1991, after receiving the Lower Yuba River Fisheries Management Plan (DFG Plan) prepared by the California Department of Fish and Game (DFG).

The DFG Lower Yuba River Fisheries Management Plan was prepared pursuant to the Streamflow Protection Standards Act (Public Resources Code section 10001 et seq.). By letter dated May 8, 1991, DFG requested that the SWRCB revise existing streamflow and temperature requirements on the lower Yuba River in accordance with the recommendations set forth in the DFG Plan. Following receipt of the DFG Plan, the SWRCB scheduled a water right hearing to begin on November 13, 1991. YCWA filed suit in federal court to enjoin the SWRCB from considering revisions to the water temperature and instream flow requirements specified in its water right permits. The court denied the request for a preliminary injunction, but the suit resulted in postponing the water right hearing until February 10, 1992.

In 1992, the SWRCB held 14 days of hearing to receive testimony and other evidence regarding fishery issues in the lower Yuba River and other issues raised in the United Groups complaint. Following the close of the hearing, parties were allowed to submit legal briefs or closing statements. A draft decision was prepared for the SWRCB's consideration, but was not acted upon by the SWRCB. Copies of the draft decision dated April 28, 1996, were distributed to hearing participants and other interested parties on February 10, 1999.

The SWRCB scheduled a subsequent hearing for September 1999, to receive relevant new evidence not previously available. At the request of DFG and YCWA, the subsequent hearing was postponed in order to provide the parties an opportunity to reach a proposed settlement regarding interim flows and further studies to be undertaken. Following notification by DFG and YCWA that they could not reach agreement on a settlement proposal, the SWRCB conducted 13 additional

days of hearing from February 22 to May 17, 2000. Parties were allowed until July 10, 2000, to submit legal briefs and written closing statements. [A revised draft decision dated November 7, 2000, was distributed to the parties to the hearing and other interested persons. The SWRCB heard comments on the November 7 draft at public meetings on December 4, 2000, and January 11, 2001. This decision includes substantial revisions based on the SWRCB's consideration of issues raised in oral and written comments on the draft decision dated November 7, 2000.](#)

The subjects addressed in this ~~proceeding-~~[decision](#) are complex and the evidentiary record is extensive.² Based on the evidentiary record and applicable law, this decision establishes revised instream flow requirements in the lower Yuba River and requires specified actions to provide suitable water temperatures for anadromous fish and reduce fish losses at water diversion facilities. However, due to evidence that it is not always feasible to provide water of suitable temperatures for protection of chinook salmon and steelhead, this decision does not establish mandatory water temperature requirements [beyond the requirements previously agreed to in the 1965 agreement](#). The order also requires a number of actions to help ensure that water diversions from the lower Yuba River are made pursuant to valid water rights.

[The historic flows in the lower Yuba River have generally substantially exceeded the minimum flow requirements specified in a 1965 agreement between YCWA and DFG and have helped maintain current fish populations in the river.](#)³ [In most months, the revised flow standards established in this decision will not require an increase over the average flows that have been present historically, but will require higher flows than the minimum levels specified in the 1965 agreement.](#)⁴ [In view of the increasing demands for water from the lower Yuba River, the](#)

² The record for this proceeding includes the record from both the 1992 hearing and the 2000 hearing.

³ [Section 6.3 of this decision discusses fishery population trends following construction of New Bullards Bar Dam in 1969.](#)

⁴ [As discussed in Section 6.4 of this decision, the instream flow requirements currently specified in YCWA's water right permits for irrigation and other uses were based upon a 1962 agreement between YCWA and DFG. That agreement was superseded by a later agreement in 1965, but the water right permits were not amended to reflect the later agreement.](#)

importance of the Yuba River fishery, and continuing disputes over the quantity and timing of flows needed for protection of fish, it is imperative that the minimum instream flow requirements in YCWA's permits be revised to assure protection of fishery resources in the years ahead.

As explained in our findings below, the SWRCB concludes that the water resources of the lower Yuba River area are sufficient to protect public trust resources while continuing to meet reasonable water demands for agriculture and other uses. The SWRCB retains continuing authority to revise the requirements established in this decision in the event changed conditions warrant further action in the future.⁵

2.0 PARTICIPANTS IN EVIDENTIARY HEARING

Seventeen parties participated in the evidentiary portion of the water right hearing and presented evidence on a broad range of issues including: (1) operation of the Yuba River Development Project, (2) present and projected water demands, (3) water temperature and flow requirements for protection of fish, (4) the presence and effectiveness of fish screens at water diversions facilities, and (5) the basis and extent of water rights held by various parties.

In 1992, DFG appeared in support of the recommendations in its Lower Yuba River Fisheries Management Plan and other recommendations based upon subsequent work. DFG presented testimony from DFG staff and private consultants who had conducted the studies on which many of the DFG recommendations are based. Although several parties took issue with various recommendations in the Fisheries Management Plan, no other party presented comprehensive recommendations for protection of the Yuba River fishery at the 1992 hearing. At the subsequent hearing in 2000, DFG presented testimony that the flow requirements in the 1996 SWRCB Draft Decision are the minimum that should be adopted immediately, with additional provisions governing flow fluctuations. DFG also presented revised water temperature recommendations

⁵ The possibility of establishing water temperature requirements in the future is addressed in Section 6.6.5 below. ~~Section 7.2 addresses the possibility of revisions to instream flow requirements due to a substantial change in future water demands for offstream uses.~~

based on the need to protect all lifestages of fall and spring-run chinook salmon and steelhead, and based on a heightened concern about spring-run chinook salmon following its listing as a threatened species under the California Endangered Species Act.

The U.S. Fish and Wildlife Service (USFWS) presented testimony in 1992 supporting adoption of the DFG recommendations. USFWS witnesses expressed concern that DFG flows may be insufficient at some times of the year, but they did not present alternative flow recommendations. In 2000, the USFWS presented testimony that the minimum flow requirements in the 1996 Draft Decision represent an appreciable improvement over the present minimum flow requirements, but urged the SWRCB to implement the minimum flow requirements in their Anadromous Fish Restoration Program Working Paper, which are consistent with the flows in the DFG Fisheries Management Plan.

The National Marine Fisheries Service (NMFS) presented testimony at the hearing in 2000 that Central Valley steelhead and Central Valley spring-run chinook salmon are currently designated as threatened species under the federal Endangered Species Act. NMFS recommended that the minimum flow provisions of the 1996 Draft Decision be adopted immediately and recommended additional provisions regarding spawning flows for spring-run chinook salmon, lower maximum water temperature requirements, restrictions on flow fluctuations, and Chinook salmon outmigration studies.

The California Sportfishing Protection Alliance (CSPA), one of the organizations composing the United Groups which filed the complaint against YCWA in 1988, presented testimony generally in support of the DFG recommendations, but preferred more stringent requirements and argued that the SWRCB should consider public trust needs in the Sacramento-San Joaquin Delta when considering modifications to YCWA's permits.

YCWA presented evidence on numerous issues including operation of the Yuba River Development Project, present and anticipated water requirements within the YCWA service area,

estimated economic effects of adopting the DFG recommendations, and various aspects of lower Yuba River fishery requirements. YCWA questioned specific aspects of DFG's recommendations, but did not present alternative flow or temperature recommendations at the time of the 1992 hearing. Following review of the SWRCB's 1996 Draft Decision and additional work by environmental and engineering consultants, YCWA presented testimony in 2000 recommending adoption of alternative flow requirements.

~~In addition to the evidence on~~ Additional evidence regarding fish and wildlife issues, ~~evidence regarding~~ water rights, and water use within Yuba County was presented by Browns Valley Water District (Browns Valley), Cordua Irrigation District (Cordua), South Yuba Water District (South Yuba), Brophy Water District (Brophy), Ramirez Water District (Ramirez), YG Development, Western Aggregates, Inc., and Western Water Company. The water districts and other entities receiving water from YCWA share a general concern that their water supplies not be adversely affected by measures taken to protect lower Yuba River fisheries.

Pacific Gas and Electric Company (PG&E) presented evidence at the 1992 hearing regarding fishery issues and hydroelectric power production on the lower Yuba River.⁶ The Department of Water Resources (DWR) presented evidence in 1992 on potential long-term transfers of water from YCWA to DWR.⁷ Walter Cook, the South Yuba River Citizens League (SYRCL), and the Mother Lode Chapter of the Sierra Club presented evidence in support of adopting additional requirements for protection of fishery and other public trust values of the lower Yuba River.

⁶ PG&E participated in the 1992 hearing, but not at the continuation of the hearing in 2000.

⁷ DWR presented evidence in the 1992 hearing, but its participation as a party in the 2000 hearing was limited to addressing preliminary issues regarding the scope of the proceeding and a pending petition by YCWA to change the place of use and related conditions in its permits. The YCWA change petition is not the subject of this order.

3.0 BACKGROUND

3.1 Yuba River Watershed

The Yuba River is the fourth largest river in the Sacramento River Basin. The river provides water for agriculture, domestic use, hydroelectric power generation, and recreation, in addition to supporting numerous species of fish including salmon, steelhead and American shad. The focus of the hearing was the lower Yuba River, i.e., the 24-mile section of the river between Englebright Dam and the confluence with the Feather River south of Marysville. Figure 1 shows major features within the Yuba River watershed.

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FIGURE 1 -- Yuba River Development Project

3.1.1 Surface Water Supplies

The Yuba River watershed drains an area of approximately 1,350 square miles that has an average unimpaired runoff of approximately 2.4 million acre-feet. Annual unimpaired runoff has varied from a low of 369,300 acre-feet to a high of 4,926,000 acre-feet. (YCWA 2, p. 2.) The estimated unimpaired flow at Smartville for 63 years of record is shown in DFG Exhibit 26, included as Table IV-3 of the 1994 staff analysis.⁸ (DFG 26, p. 19.) The United States Geological Survey (USGS) maintains gages located near Smartville and near Marysville. Table 1 below shows the median of historic recorded flows at each of those gaging stations for the years specified.

**TABLE 1
MEDIAN FLOW OF HISTORICALLY RECORDED FLOWS
IN LOWER YUBA RIVER
(CFS)**

YEAR 1941-1997	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Median Flow at USGS #1141800 (Smartville)	1490	2450	2810	3350	3030	1570	864	710	608	634	670	996
YEAR 1943-1997	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Median Flow at USGS #1142100 (Marysville)	1670	3000	3320	3290	2570	1180	458	372	403	443	596	918

Flows in the lower Yuba River are significantly affected by the operation of New Bullards Bar Reservoir which has a storage capacity of 966,000 acre-feet and Englebright Reservoir which has a capacity of 67,000 acre-feet. Historic storage levels in New Bullards Bar and Englebright Reservoirs are shown in Figure IV-2 of the 1994 staff analysis.

⁸ State Water Resources Control Board, Division of Water Rights "Staff Analysis of the Hearing Record: Fishery Resources and Water Right Issues on the Lower Yuba River," July 1994, (hereafter referred to as "1994 staff analysis.")

Deer Creek flows into the Yuba River about 1.2 miles below Englebright Dam. On average, Deer Creek contributes about 170,000 acre-feet per annum to the lower Yuba River. ((S-YCWA 13, p. 2.) Lake Wildwood is located on Deer Creek about four miles upstream from the Yuba River. YCWA ~~stated~~presented testimony that the inflow of warm water released when Lake Wildwood is drawn down for maintenance occurs at a time when it is difficult to achieve ~~the~~DFG's recommended water temperatures in the lower Yuba River. (YCWA 2, p. 240.) No data were submitted to establish the extent of this problem.⁹

Dry Creek flows into the Yuba River about 10 miles downstream of Englebright Dam. The flow in Dry Creek is regulated to a large extent by Brown's Valley Irrigation District's operation of Merle Collins Reservoir (57,000 acre-feet capacity) located on Dry Creek about eight miles upstream of the confluence with the Yuba River.

3.1.2 Groundwater Supplies

The Yuba Groundwater Basin is hydraulically divided by the lower Yuba River into the Yuba-North Basin and the Yuba-South Basin. The Yuba-North Basin provides about forty percent and the Yuba-South Basin provides about sixty percent of the total groundwater storage capacity of the Yuba Groundwater Basin. Because of sufficient surface water supplies, significant groundwater pumping capacity has not been developed to meet irrigation demands in the Yuba-North Basin. Conversely, because surface water supplies were limited in the Yuba-South Basin until the development of the South Yuba Canal in the mid-1980s, significant groundwater pumping capacity has been developed in this area.¹⁰ (S-YCWA 17, p. 1.) Only limited groundwater is available in the foothills and mountainous area of eastern Yuba County.

⁹ The order at the conclusion of this decision directs SWRCB staff to meet with representatives of the Lake Wildwood Association, DFG, and YCWA to determine ways of operating Lake Wildwood to avoid adversely impacting water temperature in the lower Yuba River.

¹⁰ The Yuba-South Basin is bounded by the Yuba River on the north, the Feather River on the west, the Bear River on the south, and the groundwater basin boundary on the east.

In 1992, YCWA presented evidence that groundwater accounts for about 31 percent or 130,000 acre-feet of irrigation water use in the county. (YCWA 45, p. 2-2.) YCWA also submitted evidence showing that at least 385 wells located in the YCWA service area provide water for irrigation. In 1984, those wells provided about 200,000 acre-feet of water at a unit cost of between \$17 and \$36 per acre-foot. (YCWA 16, Table 3.) In recent years, YCWA has been providing surface water to areas previously served by groundwater, thereby decreasing demands on the groundwater basin. In 1991 and 1994, however, water users within YCWA increased their use of groundwater in order to allow YCWA to transfer surface water to the State Water Bank. Groundwater extractions were 82,018 acre-feet in 1991 and 26,033 acre-feet in 1994. (YCWA 2, p. 12; S-YCWA 15A, Table 10; S-YCWA 27.)

The communities of Marysville, Linda, Olivehurst, and Wheatland rely totally on groundwater for their municipal water supplies. (YCWA 2, p. 12.) No evidence was submitted that any municipality intends to discontinue its use of groundwater as the primary source of supply. YCWA presented testimony that additional development in the foothills would require more surface water because limited groundwater is available in those areas.

Data developed by DWR indicate that, from 1950 to 1980, excessive pumping of groundwater created localized decreases in the groundwater levels (cones of depression) beneath Ramirez Water District, Brophy Water District, and South Yuba Water District. (YCWA 2, fig. 8-E.) Before surface water deliveries from YCWA began in 1983, these districts relied entirely on groundwater. (YCWA 2, p. 12.)

Figure 9A of YCWA Exhibit 2 illustrates the effect of surface water deliveries on groundwater elevations. The figure shows the groundwater elevation in a representative well located in the southern cone of depression within the Brophy Water District. As indicated by the exhibit, the groundwater level fell 120 feet between 1948 and 1982. YCWA began delivery of surface water to Brophy Water District in 1983 and to South Yuba Water Districts in 1986. Since that time, the

water table has risen approximately 65 feet. The recovery of the groundwater level in recent years resulted from importation of surface water for irrigation and reduction in groundwater pumping. Figure 2 below graphically depicts the groundwater storage in the Yuba-South Basin area for water years 1960 to 1998. (S-YCWA 17, pp. 6-7; Figure 4.)

FIGURE 2
ESTIMATED GROUNDWATER STORAGE
IN THE YUBA-SOUTH BASIN AREA (1960-1998)
(Based on 200,000 acre-feet storage in 1960)

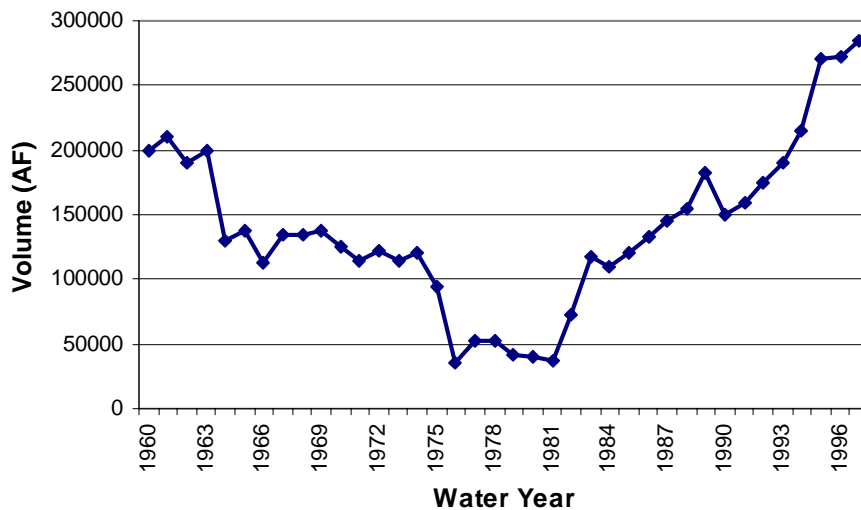


Figure 2 illustrates that, since Brophy Water District and South Yuba Water District began receiving surface water, there has been a net gain of groundwater storage in the Yuba-South Basin area. The decrease in groundwater storage in 1991 resulted from an increase in groundwater pumping undertaken to allow for transfer of surface water to the State Water Bank. (See Section 7.1.) The Yuba-South Basin's annual groundwater recharge rate was estimated to be 15,100 acre-feet per annum in years corresponding to a drying period in the long-term hydrologic cycle (1982-1990) and 21,200 acre-feet per annum in years corresponding to a wetter period in the long-term hydrologic cycle (1991-1998). (S-YCWA 17, pp. 9-11.)

YCWA presented a study of the opportunities for substituting groundwater for surface water in the Yuba-South Basin. The study estimates that the cost of pumping groundwater in the Yuba-South Basin is currently \$14 to \$18 per acre-foot including variable operation and maintenance costs, [and that these costs rise \\$1.20 to \\$1.60 per acre-foot for each 10 feet increase in pumping lift.](#) (S-YWCA 17, p. 11.) Based on information from the 1992 hearing, the YCWA consultants estimated that the annual fixed cost of maintaining pumping capacity is an additional \$11.30 per acre-foot. The YCWA study concluded that during drought periods, agricultural water users in a portion of the YCWA service area could pump groundwater as a substitute for reduced surface water supplies. The YCWA study recognizes that “when operated conjunctively with surface water, groundwater storage can be used to increase YCWA’s service reliability.” (S-YCWA 17, pp. 2 and 11.)

Due to the higher cost of using groundwater, surface water has been the preferred source of supply for irrigation in the YCWA service area when available. The record establishes that significant quantities of groundwater are available for use in a conjunctive use program, particularly in the Yuba-South Basin area where the groundwater pumping capacity and rising groundwater levels are present.

3.2 Summary of Water Rights and Diversion Facilities

YCWA is the largest water right holder on the Yuba River. Various water districts, irrigation districts, water companies and individuals contract with YCWA for delivery of water. Some of the parties that receive water from YCWA also have their own appropriative or riparian rights for diversion of water.¹¹ For the reasons explained in Section 9.7 below, this decision does not address water right issues involving diversions on the upper reaches of the Yuba River.

YCWA diverts water for consumptive uses under Water Right Permits 15026, 15027, and 15030. The permits authorize diversion of water to storage at New Bullards Bar Reservoir and direct

¹¹ Table II-1 of the 1994 staff analysis provides a summary of water right claimants and their respective claims.

diversion of water for consumptive use at downstream locations. YCWA's permits authorize direct diversion at a total rate of 1,550 cubic feet per second (cfs) from the lower Yuba River from September 1 to June 30 for irrigation and other uses, and diversion to storage in New Bullards Bar Reservoir of 961,300 acre-feet from October 1 to June 30.

In addition to providing water for consumptive use, water is released for power generation at the Colgate Powerhouse and at the Narrows 1 and Narrows 2 Powerhouses. (See Figure 1.) Hydroelectric power is generated at those locations under authorization from the Federal Energy Regulatory Commission (FERC) and eight water right licenses issued by the State. The October 18, 1991 supplemental hearing notice clarified that the current proceeding addresses diversions under YCWA's consumptive use permits, but does not involve consideration of amendment of YCWA's water right licenses for hydroelectric power production.

Water diverted under YCWA's water right permits is delivered to Browns Valley, Cordua, Hallwood, Ramirez, Brophy, and South Yuba. Browns Valley receives water at the Pumpline Diversion Facility located nine-tenths of a mile upstream of Daguerre Point Dam. Cordua, Hallwood, and Ramirez receive water via the Hallwood-Cordua Canal (North Canal) from the north side of the Yuba River just upstream of the north abutment of Daguerre Point Dam. Brophy and South Yuba receive water via the South Yuba Canal (South Canal) from the south side of the Yuba River just upstream of the abutment of the Daguerre Point Dam. The location of these diversion facilities is shown in Figure 1.

In addition, YCWA began serving water to the Dry Creek Mutual Water Company in 1998. Several private parties pump water from the lower Yuba River downstream of Daguerre Point Dam in an area known as the Dantoni Area. The basis and extent of the water rights held by the various water districts and other parties who receive water from YCWA or divert water from the lower Yuba River are addressed below in Sections 10.0 through 10.9.

3.3 Operation of Yuba River Development Project

The Yuba River Development Project is a multiple-use project utilized for flood control, generation of hydroelectric power, irrigation, recreation, and protection of fish and wildlife. The key component of the project is New Bullards Bar Reservoir, completed in 1970, which has a storage capacity of 966,000 acre-feet. Englebright Dam and Daguerre Point Dam were not constructed by YCWA as part of the Yuba River Development Project, but are used [by YCWA](#) in delivering water for project purposes.

Englebright Reservoir is located on the Yuba River about six miles downstream of New Bullards Bar Reservoir and about 26 miles east of Marysville. The dam was completed by the California Debris Commission ([a division of the U.S. Army Corps of Engineers](#)) in 1941 as a debris barrier, ~~and is now under the jurisdiction of the U.S. Army Corps of Engineers.~~ Englebright Reservoir serves as the afterbay for [YCWA's](#) New Colgate Powerhouse and the forebay for power generation at the Narrows 1 and Narrows 2 Powerhouses. PG&E has direct diversion rights to 700 cfs and storage rights to divert 45,000 acre-feet per year from October 1 through March 1 for power generation at Narrows 1 Powerhouse. (Application 8794, License 6388.)

Daguerre Point Dam was constructed in 1906 by the California Debris Commission to prevent debris from reaching the navigable channels of the Feather and Sacramento Rivers. [The dam is still owned and operated by the U.S. Army Corps of Engineers.](#) The dam currently provides no significant storage capacity due to siltation, [but the dam serves to raise the water elevation in the immediate upstream area and thereby enables diversion of water into the three major canals through which YCWA delivers water for offstream use.](#) Water is diverted at Daguerre Point Dam to water districts located both north and south of the Yuba River. There are extensive dredger tailings in the vicinity of Daguerre Point Dam in an area commonly referred to as the Yuba Goldfields.

The operation of the Yuba River Development Project is subject to provisions of various permits, licenses and contracts including water right permits and licenses administered by the SWRCB,

Federal Power License 2246, the 1966 Power Purchase Contract with PG&E, a 1965 contract with the Department of Fish and Game concerning instream flows, and a 1966 contract with the Department of Water Resources under the Davis-Grunsky Act. (YCWA 2, pp. 3 and 4.) YCWA determines project operations based on a year-to-year analysis. (R.T. VII, 132:13-132:14.) Several of the uses served by the project are addressed below in Sections 3.3.1 through 3.3.7.

3.3.1 Hydroelectric Power

YCWA operates the Yuba River Development Project to generate hydroelectric power pursuant to the provisions of Federal Power License 2246 administered by the Federal Energy Regulatory Commission (FERC), its water right licenses for power production, and the 1966 Power Purchase Contract between YCWA and PG&E. Most water released from New Bullards Bar Reservoir flows through the Colgate Powerhouse into Englebright Reservoir. The Colgate Powerhouse operates as a peaking facility which may be run at full capacity for a few hours each day. (YCWA 18, p. 10.) There is a fish bypass requirement of 5 cfs to be released into the Yuba River below New Bullards Bar.

Englebright Reservoir serves as an afterbay for the Colgate Powerhouse and a forebay for Narrows 1 and Narrows 2 Powerhouses. Narrows 1 Powerhouse is operated pursuant to a federal power license held by PG&E and Narrows 2 Powerhouse is operated pursuant to a federal power license held by YCWA. The operation of Narrows 1 and 2 Powerhouses depends upon the water level, or "head," in Englebright Reservoir and the amount of water being released. The two powerhouses have a combined capacity of 4,100 cfs.

The 1966 YCWA/PG&E Power Purchase Contract contains criteria governing operation of the Yuba River Development Project. Appendix C of the contract defines minimum monthly quota for generation of power at the Colgate Power Plant and critical end-of-month storage levels in New Bullards Bar Reservoir. The operational criteria specified in the contract can be modified by mutual agreement of PG&E and YCWA. (YCWA 2, p. 10.)

Since the mid-1980s, the Yuba River Development Project has been operated to reduce winter energy production when storage or forecasted runoff is low in order to conserve water for power generation during summer months. (YCWA 14, p. 3: R.T. V, 114:6-114:25; YCWA 36.) This practice allows for generation of more hydroelectric power during the summer months when it is more valuable. (S-YCWA 11, p. 6.) In addition, New Bullards Bar Reservoir storage ~~normally~~ frequently has been maintained above the minimum storage levels. Recent operating practices ~~are not representative-~~ have not followed all of the criteria specified in the Power Purchase Contract.

In 1993, FERC issued a new license (Project No. 1403-004) to PG&E for the operation of the Narrows 1 Powerhouse. The SWRCB may take official notice of the FERC order pursuant to section ~~761~~648.2 of title 23 of the California Code of Regulations. Table 2 shows the minimum required flows under Article 402 of PG&E's federal power license.

TABLE 2
YUBA RIVER FLOWS AT SMARTVILLE
AS SPECIFIED IN FEDERAL POWER LICENSE 1403

OPERATING PERIOD	REQUIRED FLOW AT SMARTVILLE GAGE(CFS)
October 1 - March 31	700
April 1 - April 30	1,000
May 1 - May 31	2,000
June 1 - June 30	1,500
July 1 - September 30	450

The flow standards specified by FERC are numerically equal to the flows recommended by DFG in the Fisheries Management Plan. However, DFG recommends that the minimum flows be maintained at the Marysville gage rather than the Smartville gage as required in the FERC order. The FERC license allows for reductions in the specified flows under certain conditions. (February 11, 1993, FERC Order on Project No. 1403-004, pp. 23-25.) Therefore, it is difficult to determine the impact of the new FERC license requirements on flows in the lower Yuba River. However, the FERC order cites an analysis that indicates: (1) PG&E can substantially increase the

frequency of meeting DFG recommended flows in April, May, and June; (2) flows in the winter months frequently exceed the specified flows; and (3) release of water for irrigation during the summer would exceed the minimum flow requirements. (February 11, 1993, FERC Order on Project No. 1403-004, pp. 7 and 8.)

Under the YCWA/PG&E Power Purchase Contract, PG&E pays YCWA \$8 million per year for all power generated. (YCWA 6, p.2.)¹² This annual payment is not contingent on the amount of power produced in any given year. PG&E will receive all the hydroelectric power generated by the Project at the prices specified in the 1966 Power Purchase Contract until 2016. Therefore, any reduction in the economic value of power produced until the year 2016 is a direct cost to PG&E rather than to YCWA. After 2016, changes in the value of hydroelectric power due to changes in instream flow requirements would affect YCWA. (S-YCWA 11, p. 7.)

Legislation passed in ~~1998~~1996 created a deregulated market for electricity in California beginning in 1998 under which the wholesale price of electricity varies on an hourly basis. ~~YCWA did not provide an analysis of the potential hourly impacts of changes in instream flow requirements on the operation of the YCWA hydroelectric facilities or a forecast of hourly power and ancillary services prices. Absent such an assessment,~~ (Public Utilities Code §§ 330 to 397.) The SWRCB takes official notice of the fact that the recent electrical energy market in California has been in a state of turmoil. (Cal. Code Regs., tit. 14, §648.2; Evidence Code § 451(f).) Therefore any prediction of the effect on hydroelectric revenue due to changes in instream flow requirements would be ~~pure speculation~~ highly speculative. (See also S-YCWA-12, p. 7.)

¹² The money received from PG&E is used to pay off the Series A revenue bonds that were used to finance the majority of YCWA's project development costs. The Series A bonds are expected to be retired in 2015. (YCWA 8, p. 7.)

3.3.2 Flow and Temperature Requirements Currently Applicable to Yuba River Development Project

YCWA currently operates its facilities to meet the instream flows specified in the 1965 agreement with DFG which requires flows in the lower Yuba River immediately below Daguerre Point Dam as specified in Table 3 below. (S-YCWA 13, p. 3.)

**TABLE 3
FLOWS SPECIFIED IN 1965 DFG/YCWA AGREEMENT**

TIME PERIOD	FLOW REQUIREMENT BELOW DAGUERRE POINT DAM (CFS)
January 1 - June 30	245
July 1 - September 30	70
October 1 - December 31	400

Releases required by the 1965 Agreement are subject to reductions in critical dry years, which are defined as those years for which the DWR April 1 forecast predicts that annual unimpaired flow in the lower Yuba River at Smartville will be 50 percent or less of normal. The water release curtailments for critical dry years are release reductions of 15, 20, and 30 percent when Yuba River unimpaired flow forecasts are, respectively, 50, 45, and 40 percent or less of normal. The critical year provision is effective from the time of the forecast until April 1 of the following year. However, in no event may water releases be reduced to less than 70 cfs. (DFG 26, pp. 187-188.)

The 1965 agreement with DFG also provides that:

“The AGENCY [YCWA] shall so locate and operate the power intake and outlet works of New Bullards Bar Dam so as to provide water temperatures of the releases from New Bullards Bar Dam comparable to or better than present values with regard to fishery resources.” (DFG 26, p. 190.)

In 1966, YCWA received a \$4.4 million grant from DWR under the Davis-Grunsky Act to assist in the construction of the Yuba River Development Project. The grant provided funds for fishery

enhancement and recreational facilities. Section 21 of the grant contract specifies conditions relating to flow and temperature standards for protection of the lower Yuba River fishery. The contract requires that from October 1 through March 31 YCWA must:

“. . . regulate the water releases through the multi-level intake facility in the dam (New Bullards Bar) so as to provide, to the maximum extent possible, water temperatures between 46 degrees Fahrenheit and 56 degrees Fahrenheit in the spawning area and shall make all reasonable efforts to maintain a constant temperature of 52 degrees Fahrenheit in the spawning area.” (CSPA Exhibit AA, pp. 39-42.)

The reservoir control gates at New Bullards Bar Dam provide the ability to release water from different levels at the dam, from near the surface elevation at elevation 1,956 feet to a low-level outlet at elevation 1,638 feet. (S-YCWA-18, p. 7.) In 1992, YCWA presented testimony that it ~~operates~~ had operated the multi-level outlet as directed by DFG, releasing cooler water from the low level outlet in September and warmer water from the high level outlet in April.

(R.T. V, 72:9-72:17.) YCWA presented testimony in 2000, however, that under ~~current~~ revised operational procedures which were established by the Water Temperature Advisory Committee in 1993, the low level outlet at New Bullards Bar Dam ~~is~~ has been used for water releases throughout the year since 1993. (S-YCWA 11, pp. 2-3; S-YCWA 18, p. 7; S-R.T. 1349:12-1349:13.)¹³

YCWA also presented testimony that it may be extremely difficult to meet the proposed DFG daily temperature standards for the lower Yuba River. (R.T. V, 90:16-90:20.) As discussed in Section 6.6 below, YCWA recently submitted a proposal for funding for a project that would allow for release of water from the lower level of Englebright Reservoir. If constructed, the project may allow for reducing the temperature of releases from Englebright Reservoir by from 2 to 6 degrees Fahrenheit from May through October. (S-SWRCB 12.)

3.3.3 Flood Control

New Bullards Bar Reservoir is operated in accordance with a 1966 contract with the U. S. Army Corps of Engineers (Corps of Engineers) that requires YCWA to maintain required flood control

storage space in the reservoir. (YCWA 2, p. 3.) ~~The operational criteria governing flood control at New Bullards Bar are not a major factor during drought years. (R.T. V, 81:21-81:25.)~~ In accordance with the 1966 contract, the Corps of Engineers provided \$12.6 million toward construction of New Bullards Bar Reservoir. (YCWA 2, p. 10.) Englebright Reservoir has a gross storage capacity of 67,000 acre-feet and a usable storage capacity of 45,000 acre-feet. There presently is no low level outlet. Englebright Reservoir is drawn down in the fall to provide additional flood protection. (YCWA 2, p. 6.) The reservoir is operated jointly by YCWA and PG&E under terms of the YCWA's 1966 contract with the Corps of Engineers. (YCWA 2, p. 5; YCWA 3, p. 14.)

3.3.4 Irrigation

YCWA currently supplies water to the Hallwood, Cordua, Ramirez, Browns Valley, Brophy, South Yuba, Naumes, Inc., Wilbur Ranches, and Dry Creek Mutual Water Company.

(S-YCWA 27.) Some of the YCWA contracts allow for delivery of less water in dry years, based on the percentage of normal run-off forecast by DWR. (YCWA 14, Table 2.) For example, if the DWR forecast shows that runoff will be less than 40 percent of normal, YCWA can impose up to a 50 percent deficiency in water deliveries to Cordua Irrigation District, Hallwood Irrigation District, and the Dantoni area, including water delivered for fall flooding of rice fields.

In addition to water deliveries under existing contracts, YCWA has plans to deliver water to the Wheatland Water District and an area referred to as the “Wheatland Detachments,” neither of which yet has a water distribution system or water service contract with YCWA. (S-YCWA [15](#), p. 7.) YCWA's water demand for irrigation is addressed further in Section 7.1 below.

3.3.5 Recreation

In addition to storing and releasing water for other uses, New Bullards Bar Reservoir and Englebright Reservoir are used for boating, fishing, and camping. There was general testimony

¹³ The Water Temperature Advisory Committee was formed in 1993 with representatives of YCWA, DFG, and USFWS.

that recreational use is enhanced by keeping the reservoirs as full as possible, particularly in the summer, but no detailed evidence was presented regarding operational criteria for recreational uses at either reservoir.

3.3.6 Use of Water Outside of YCWA Service Area

In addition to uses within the Yuba River watershed, water from the Yuba River serves important uses downstream. Prior to initiation of a series of short-term water transfers beginning in 1987, the water released from New Bullards Bar Reservoir that was not used in the YCWA service area flowed from the Yuba River into the Feather River, then into the Sacramento River, and then into the Sacramento-San Joaquin River Delta (Delta). As with water reaching the Delta from other tributaries, flow from the Yuba River was available for satisfying other water rights or meeting Delta outflow requirements.

In the late 1980s, YCWA made water available to water users outside of Yuba County in accordance with statutory provisions encouraging water transfers. Water Code section 109 sets forth legislative policy encouraging voluntary water transfers where consistent with the public welfare of the place of export and the place of import. When applicable statutory requirements are met, the SWRCB has supported the concept of utilizing water transfers as an effective method of meeting water needs throughout the State, particularly during drought conditions.

Between 1987 and 1991, the SWRCB approved all 12 requests for water transfers which were submitted by YCWA in accordance with Water Code section 1725 et seq.¹⁴ The SWRCB approved transfer of a total of 822,700 acre-feet of water, of which approximately 725,700 acre-feet was delivered to a variety of water users. These transfers resulted in approximately \$30 million in revenue to YCWA. In most instances, YCWA and DFG were able to agree on terms to prevent unreasonable effects on fish and wildlife that were included as conditions of the orders approving the temporary transfers. Since 1992, hydrologic conditions

¹⁴ The quantities of water, the parties involved, and the SWRCB orders approving the transfers are summarized in Table I-1 of the 1994 Staff Analysis.

have been relatively wet and YCWA has participated in only two out of county transfers, one in 1994 and another in 1997. YCWA has received inquiries about potential transfers from several other water districts. (S-YCWA 11, p. 9.)

3.4 Relation of Present Proceeding to Previous Temporary Water Transfers

The present proceeding was initiated to consider the recommendations of the DFG Fisheries Management Plan and to address other issues raised by the 1988 United Groups complaint. The fishery study on which many of the DFG recommendations are based was initiated in 1986 prior to the YCWA water transfers approved by the SWRCB. This proceeding is not directed at consideration of proposed future water transfers or reconsideration of previously approved transfers. Rather, this proceeding addresses measures necessary to protect fisheries in the lower Yuba River on an ongoing basis.¹⁵

Nevertheless, representatives of YCWA have attempted to tie this proceeding to YCWA's past water transfers and have suggested that the SWRCB has been critical of YCWA for having engaged in water transfers. (e.g., R.T. IV, 26:4-26:12.) In view of the potential importance of water transfers for meeting water needs throughout the state, we believe it is imperative to avoid any misconception regarding SWRCB support of water transfers meeting statutory requirements. The SWRCB approved all 14 requests for water transfers submitted by YCWA. The SWRCB's position has been that consideration of fish and wildlife effects of temporary transfers should focus on the effects of the particular transfer in question. (SWRCB Order WR 88-12, p. 14.) Prior to the proceedings leading to this decision, correspondence from YCWA indicates the agency was in agreement with the standard used by the SWRCB in evaluating effects of proposed water transfers

¹⁵ Although transfers of water outside the place of use presently authorized in YCWA's permits were not the subject of this hearing, the SWRCB acknowledges that establishing well-supported instream flow requirements as a requirement of YCWA's permits could help expedite processing of any future petitions for water transfers under YCWA's permits.

on fish and wildlife. (SWRCB 1, letter dated July 12, 1989 from attorney Paul Bartkiewicz to Walt Pettit.)¹⁶

In summary, the record demonstrates that the concern regarding protection of the lower Yuba River fishery predates SWRCB actions on temporary water transfers by YCWA. The SWRCB supports the concept of water transfers and has approved all temporary water transfer proposals presented by YCWA. The SWRCB is also on record, however, as recognizing the need to address long-term measures needed to protect fishery resources in the lower Yuba River. Our commitment to address long-term Yuba River fishery issues in the context of this proceeding was appropriately cited by YCWA as reason not to address those issues in the context of previous proceedings on temporary water transfers. In view of the SWRCB's record of support for temporary water transfers, there is no basis for any suggestion that the present proceedings were initiated due to opposition to water transfers.

4.0 STATUTORY PROVISIONS REGARDING PROTECTION OF FISHERY RESOURCES

Congress and the California Legislature have enacted several state and federal statutes that are particularly relevant to consideration of fishery protection measures on the lower Yuba River. State statutes include Fish and Game Code section 5937; the Streamflow Protection Standards Act; the Salmon, Steelhead Trout and Anadromous Fisheries Program Act; and the California Endangered Species Act. Key federal statutes are the Central Valley Project Improvement Act and the Federal Endangered Species Act. Those statutes are described below.

¹⁶ Prior to the start of the 1992 hearing, YCWA is on record expressing its appreciation for SWRCB staff's expeditious processing of two water transfer petitions. (Staff 1, letter dated May 1, 1989 from Paul Bartkiewicz to Dave Cornelius.) During the SWRCB's consideration of a YCWA water transfer proposal in 1991, several parties urged the SWRCB to apply the flow requirements of the DFG Fisheries Management Plan. YCWA responded that it would not be appropriate to consider those issues when the SWRCB had previously indicated that long-term flows in the Yuba River would be examined in a publicly noticed hearing. (SWRCB 1, letter dated July 30, 1991 from attorney Alan Lilly to Bert Parkinson of the SWRCB Division of Water Rights.) Thus, prior to this proceeding, YCWA appeared to recognize the distinction between addressing issues related to temporary water transfers and addressing issues related to long-term flow requirements in the lower Yuba River.

4.1 Fish and Game Code Section 5937

The basic statutory requirement for release of water from a dam to protect downstream fish is set forth in Fish and Game Code section 5937 which provides, in pertinent part:

"The owner of a dam shall allow sufficient water at all times to pass through a fishway, or in the absence of a fishway, allow sufficient water to pass over, around or through a dam to keep in good condition any fish that may be planted or exist below the dam."

4.2 Streamflow Protection Standards Act

The DFG Lower Yuba River Fisheries Management Plan was prepared in response to the Streamflow Protection Standards Act (Public Resources Code § 10000 et seq., enacted in 1982). The act directs DFG to identify streams and watercourses throughout the state for which minimum flow levels need to be established to assure the continued viability of stream-related fish and wildlife resources. (Public Resources Code § 10001.) In developing minimum flow requirements, DFG is directed to consult with state officials, local governments, and any private individuals or groups deemed advisable. DFG is directed to transmit its proposed requirements to the SWRCB. (Public Resources Code § 10002.)

Water Code section 1257.5 directs the SWRCB to consider the flow requirements proposed by DFG when acting upon applications to appropriate water and authorizes the SWRCB to "establish such streamflow requirements as it deems necessary to protect fish and wildlife as conditions in permits and licenses." Either on its own motion or at the request of the SWRCB, DFG may review streamflow requirements and propose modifications of those requirements. (Public Resources Code § 10003.) DFG's recommendations should also be considered by the SWRCB in the exercise of its continuing authority to supervise the diversion and use of water in order to protect public trust resources. (See Section 5.2 below.)

4.3 Salmon, Steelhead Trout and Anadromous Fisheries Program Act

Legislative policy with respect to protection of anadromous fisheries is set forth in the Salmon, Steelhead Trout, and Anadromous Fisheries Program Act enacted in 1988. The Act emphasizes

the importance of protecting and increasing the naturally spawning salmon and steelhead trout of the State in order to provide a valuable public resource, a large statewide economic benefit, and employment opportunities not otherwise available. (Fish and Game Code § 6901.) The act establishes state policy to "significantly increase the natural production of salmon and steelhead trout by the end of this century." (Fish and Game Code § 6902(a).) The act also declares that "existing natural salmon and steelhead trout habitat shall not be diminished further without offsetting the impacts of the lost habitat." (Fish and Game Code § 6902(c).) In establishing fishery protection flows for the lower Yuba River, the SWRCB is obligated to consider the Legislature's policy regarding the importance of protecting salmon and steelhead trout and increasing natural production of those fish.

DFG presented evidence that the lower Yuba River is one of the most important locations in the state for natural production of chinook salmon. (R.T. I, 53:1-54:22.) The flows in the lower Yuba River have generally been significantly higher than the minimum levels specified in the 1965 agreement between YCWA and DFG. To allow flows to be reduced to the levels specified in the 1965 agreement would be contrary to the Legislature's declared policy of maintaining and improving salmon habitat. (Fish and Game Code §§ 6901(g) and 6902(c).)¹⁷

Pursuant to the Salmon, Steelhead Trout and Anadromous Fisheries Program Act, DFG developed the Steelhead Restoration and Management Plan for California in 1996. (S-DFG 29.) That plan recommends management of the Yuba River as a wild steelhead fishery, with no hatchery stocking. The plan also recommends that DFG continue to seek adequate flows, temperatures and other restoration measures included in the 1991 Yuba River Fisheries Management Plan. (DFG 26.)

¹⁷ Section 6.4 of this decision addresses the inadequacy of the 1965 agreement flows for fishery protection.

4.4 California Endangered Species Act

The California Endangered Species Act (CESA) establishes various requirements and protections regarding species listed as threatened or endangered under State Law. (Fish and Game Code §§ 2050-2068.) The exercise of authority by state agencies in actions involving threatened or endangered species is governed by Fish and Game Code section 2055 which provides:

“The Legislature further finds and declares that it is the policy of this state that all state agencies, boards, and commissions shall seek to conserve endangered species and threatened species and shall utilize their authority in furtherance of the purposes of [CESA].”

Sacramento spring-run chinook salmon, which occur in the lower Yuba River, were listed as a threatened species on February 5, 1999 under the CESA. (S-DFG 1, pp. 1-2; S-DFG 13, p. 1; S-R.T. 1944:23-1945:1; S-R.T. 1961:24-1962:4.) Thus, in exercising authority over water rights in the lower Yuba River, the California Endangered Species Act requires the SWRCB to seek to conserve spring-run chinook salmon.

4.5 Federal Endangered Species Act

The federal Endangered Species Act (ESA) is designed to preserve endangered and threatened species by protecting individuals of the species and their habitat, and by implementing measures to promote their recovery. Under the ESA, an endangered species is defined as one that is in danger of extinction in all or a significant part of its range, and a threatened species is one that is likely to become endangered in the near future. (16 U.S.C. § 1532.)

In 1997, NMFS completed a status review of chinook salmon in the west coast states and concluded that Central Valley spring-run chinook salmon are in danger of extinction or are likely to become endangered in the near future. (S-NMFS 2, p. 251.) NMFS cited habitat problems as the most important ongoing risk. The general degradation of conditions in the Sacramento River Basin (including elevated water temperatures, agricultural and municipal diversions and returns, restricted and regulated flows, entrainment of migrating fish into unscreened or poorly screened diversions, and the poor quality and quantity of remaining habitat) were cited as severely impacting juvenile rearing habitat and migration corridors. (S-NMFS 2, p. 251.) On September

16, 1999, NMFS designated Central Valley spring-run chinook salmon as a threatened species under the ESA. (S-NMFS 1a, p. 2; S-NMFS 4; S-R.T. 123:15-123:17.)¹⁸

In 1996, NMFS completed a status review of steelhead trout in Washington, Idaho, Oregon, and California and concluded that Central Valley steelhead are presently in danger of extinction. (S-NMFS 5, p. 169.) Habitat concerns cited include widespread degradation, destruction, and blockage of freshwater habitats within the region. (S-NMFS 5, p. 169.) On March 19, 1998, NMFS designated Central Valley steelhead as a threatened species under provisions of the ESA. (S-NMFS 1a, pp. 2-3; S-NMFS 7; S-R.T. 123:21-123:23.)

NMFS designated critical habitat for Central Valley spring-run chinook salmon and Central Valley steelhead on February 16, 2000. The designated area includes the lower Yuba River from Englebright Dam to the confluence with the Feather River. (S-NMFS 13; S-R.T. 123:18-123:20; S-R.T. 123:24–124:2.) Flow quality and quantity are considered constituent elements of critical habitat. (S-R.T. 124:3-124:5.)

Section 9 of the ESA prohibits certain activities that directly or indirectly affect endangered species. (16 U.S.C. § 1538.) The prohibitions apply to all individuals, organizations, and agencies subject to U.S. jurisdiction. (16 U.S.C. § 1532 (13).) Section 4(d) of the ESA provides that regulations for conservation of threatened species may include any or all of the prohibitions applicable to threatened species. NMFS intends to issue protective regulations pursuant to Section 4(d) for Central Valley spring-run chinook. (S-NMFS-4, p. 50413.) On December 30, 1999, NMFS issued a proposed rule identifying the regulations NMFS believes necessary and advisable to conserve Central Valley steelhead trout that occur in the lower Yuba River. (S-DFG-37.) On July 10, 2000, NMFS issued a final Section 4(d) rule applicable to take of Central Valley steelhead. (50 CFR Part 223 Vol. 65 No.132, pp. 42422-42481.)

¹⁸ On September 16, 1999, NMFS determined that listing Central Valley fall-run and late fall-run chinook salmon as threatened or endangered species was not warranted at this time, but designated these runs as candidate species under the federal ESA. (S-NMFS 4, p. 50394.)

In the final rule, NMFS defined categories of activities very likely to injure or kill salmonids and result in a violation of the take prohibitions provided in the rule. Types of activities defined in the rule that occur on the lower Yuba River include: (1) constructing or maintaining barriers that eliminate or impede a listed species' access to habitat or ability to migrate; (2) removing water or otherwise altering streamflow when it significantly impairs spawning, migration, feeding or other essential behavior patterns; (3) constructing or operating dams or water diversion structures with inadequate fish screens or fish passage facilities in a listed species' habitat; and (4) altering lands or waters in a manner that promotes unusual concentrations of predators. The rule states that persons or entities who conclude that their activity is likely to injure or kill protected fish are encouraged to immediately adjust that activity to avoid take and seek NMFS' authorization for incidental take under: (1) an ESA section 10 incidental take permit, (2) an ESA section 7 consultation, or (3) a limit on the take prohibitions provided in the rule.

YCWA and SYWD presented testimony suggesting that, in the Feather River basin, spring-run chinook salmon are not genetically distinct from fall-run chinook salmon. (S-SYWD 6; S-R.T. 933:6-933:17; S-R.T. 2881:16-2884:23.) A DFG witness responded that the conclusion about the genetic characteristics of fall-run and spring-run chinook salmon in the Yuba River referred to by YCWA and SYWD was based on results of a preliminary study that has not been peer-reviewed. (S-R.T. 2168:11-2170:3.) DFG also noted that during the federal ESA status review, NMFS concluded that spring-run chinook salmon in the Feather River were genetically distinct from fall-run chinook. (S-R.T. 2141:14-2141:20; S-R.T. 2170:4-2170:17.)

The classification of species and designation of critical habitat under the state and federal Endangered Species Acts are not within the jurisdiction of the SWRCB. Unless the designations of threatened species or critical habitat are revised or overturned, the SWRCB will give appropriate consideration to the status of Central Valley spring-run chinook salmon and Central Valley steelhead as threatened species and the inclusion of the lower Yuba River in the critical habitat designations.

5.0 AUTHORITY OF STATE WATER RESOURCES CONTROL BOARD

The State Water Resources Control Board has broad authority to establish minimum flows and take other measures needed for protection of fisheries and other public trust resources. That authority is provided by article X, section 2 of the California Constitution, Water Code sections 100 and 275, the public trust doctrine as articulated by the California Supreme Court in *National Audubon Society v. Superior Court* (1983) 33 Cal.3d 419 [189 Cal. Rptr. 346], and Water Code sections 1243 and 1253.

5.1 Reasonableness Doctrine

Article X, section 2 of the California Constitution and Water Code section 100 prohibit the waste, unreasonable use, unreasonable method of use or unreasonable method of diversion of water. Water Code section 275 directs the SWRCB to take all appropriate proceedings or actions to prevent violations of the reasonable use standard. The limitations of article X, section 2 of the California Constitution apply to all water users of the state and serve as a limitation on every water right and every method of diversion. (*Peabody v. Vallejo* (1935) 2 Cal.2d 351, 367, 372 [40 P. 2d, 486, 491, 498-499].) The SWRCB's jurisdiction to regulate water diversion and use in accordance with article X, section 2 extends to pre-1914 rights. (*Imperial Irrigation District v. State Water Resources Control Board* (1986) 186 Cal.App.3d 1160 [231 Cal.Rptr. 283].)

Article X, section 2 of the California Constitution provides that the general welfare requires that the State's water resources be put to beneficial use to the fullest extent to which they are capable. Therefore, in determining the reasonableness of a particular use of water or method of diversion, other competing water demands and beneficial uses of water must be considered. A particular water use or method of diversion may be determined to be unreasonable based on its impact on fish, wildlife, or other instream beneficial uses. (*Environmental Defense Fund, Inc. v. East Bay Municipal Utility District* (1980) 26 Cal.3d 183, [161 Cal.Rptr. 466].)

5.2 Public Trust Doctrine

Under the public trust doctrine, the State retains ongoing supervisory control over navigable waters and the lands beneath those waters. The purpose of the public trust is to protect navigation, fishing, recreation, fish and wildlife habitat, and aesthetics. (*National Audubon Society v. State Water Resources Control Board*, *supra*, 33 Cal.3d at 434-435, 437 [189 Cal. Rptr. at 356, 358]; cert. denied, 464 U.S. 977.) Fish and Game Code section 5937 is a legislative expression concerning the public trust doctrine that should be taken into account when the SWRCB acts under its public trust authority. (See *California Trout, Inc. v. State Water Resources Control Board* (1989) 207 Cal.App.3d 585, 626, 631 [255 Cal. Rptr. 209, 212].)

In applying the public trust doctrine, the State has the power to reconsider past water allocations even if the State considered public trust impacts in its original water allocation decision. Thus, the fact that minimum flow requirements were included as conditions of YCWA's water right permits does not prevent the SWRCB from reevaluating the subject of fishery protection based on more recent evidence and changed conditions. The State has the duty of continuing supervision over the taking and use of appropriated water and an affirmative duty to protect public trust uses whenever feasible. (*National Audubon Society v. Superior Court*, *supra* 33 Cal.3d at 445-448 [189 Cal.Rptr. at 363-366].)

YCWA recognizes that the SWRCB may reconsider past water right decisions that were made after consideration of public trust values if a past decision was incorrect in light of current knowledge or is inconsistent with current needs. (YCWA closing brief, p. 14.) However, YCWA argues that “[n]either the public trust doctrine nor Fish and Game Code section 5937 authorizes the [SWRCB] to require Yuba to release water stored in New Bullards Bar Reservoir to augment flows that would otherwise occur in the lower Yuba River, to attempt to mitigate the adverse impacts of Englebright Dam.” (YCWA closing brief, p. 17.)

For the reasons discussed below, the SWRCB concludes that in the present case, as in several prior cases, application of the public trust doctrine requires amendment of YCWA’s water right permits

to establish instream flow requirements that involve release of water from storage during some periods. The instream flow requirements and other provisions of this decision will protect fish and fish habitat in the lower Yuba River and will partially mitigate for the ongoing adverse effects of Englebright Dam, Daguerre Point Dam, and ongoing diversions of water under YCWA's permits.

Englebright Dam and Daguerre Point Dam were incorporated into the design of, and are integral parts of, YCWA's Yuba River Development Project. Englebright Reservoir is jointly operated by YCWA and PG&E. (YCWA 2, p. 5, YCWA 3, p. 14.) The reservoir is operated as an afterbay for YCWA's Colgate Powerhouse and a forebay for YCWA's Narrows 2 Powerhouse and PG&E's Narrows 1 Powerhouse. Englebright Reservoir receives the widely fluctuating releases of water back into the Yuba River from the Colgate Powerhouse and allows YCWA to regulate its release of water for downstream irrigation deliveries. (YCWA 2, p. 5.)

Current operations of the Yuba River Development Project are dependent upon the continued presence of Englebright Reservoir which allows YCWA to regulate releases for downstream diversion at the three major diversion canals located near Daguerre Point Dam. Daguerre Point Dam serves as a diversion dam for the majority of the irrigation diversions under YCWA's permits. (YCWA 2, p. 5.) Thus, although YCWA did not build Englebright Dam or Daguerre Point Dam, YCWA is involved in the ongoing operation of Englebright Reservoir, and both dams are integral parts of the project authorized by YCWA's water rights.

The impacts of Englebright Dam and Daguerre Point Dam on Yuba River fisheries are not limited to past injuries at the time of construction. Rather, the impacts of the dams are more accurately viewed as a continuing harm to the fishery. As long as the dams continue to block or impede free passage of anadromous fish, they continue to harm anadromous fisheries by preventing or impeding migration to upstream areas that provide spawning and rearing habitat formerly utilized by salmon and steelhead. Due to the dams and reservoirs on the Yuba River, fish that would otherwise be able to migrate to upstream habitat are now dependent on maintenance of suitable conditions downstream.

The extent to which a project developer may be required to provide mitigation for adverse effects on public trust resources caused by unrelated prior projects need not be decided in the present case. In this instance, YCWA benefits from, and participates in, the ongoing operation of previously constructed facilities that eliminate or reduce access to suitable upstream habitat for anadromous fish. Moreover, although the record shows that overall fish populations have stabilized or slightly increased following YCWA's construction of New Bullards Bar Dam, the record is also clear that diversion of water under YCWA permits has resulted, and is continuing to result, in the loss of thousands of young salmonids annually. (See Sections 6.7 through 6.7.4.)

Full restoration of the Yuba River fishery and fish habitat to pre-development conditions would require removal of Englebright Dam and other facilities and a substantial reduction in water diversions. Due to the role of dams and diversion facilities in making water available for consumptive uses and hydropower production, however, restoration of pre-development fishery conditions on the Yuba River is not feasible. However, as is the case on many California rivers with major reservoirs, the release of stored water into the lower Yuba River helps provide conditions downstream of the reservoirs that serve to replace, in part, the fishery habitat that would otherwise be available upstream.¹⁹ (See, e.g., SWRCB WR 90-5 at p. 18 [discussing the effect of Shasta and Keswick dams], SWRCB Order WR 86-9 at p. 11 [discussing applicability of the public trust doctrine to require releases from a reservoir to protect downstream fisheries where dams and diversions have modified the watercourse].)

¹⁹ The 1993 FERC order applicable to PG&E's Narrows 1 project, discussed in Section 3.3.1 above, requires PG&E to release up to 45,000 acre-feet of stored water in order to meet the instream flow requirements established by FERC for protection of fish downstream of Englebright Dam. (February 11, 1993, FERC Order on Project No. 1403-004.) As explained in Section 6.5.9 below, this decision establishes minimum instream flow requirements to be measured at the Marysville gage. Thus, the flow requirements established in this decision will ensure that a larger portion of the water released for fish by PG&E remains in the river downstream of YCWA's points of diversion near Daguerre Point Dam. During periods when the combination of natural flow and any water released from storage by PG&E is not sufficient to meet the requirements of this decision, then YCWA will have to supplement flow from those sources with storage releases from New Bullards Bar.

Due to factual differences regarding public trust resources and competing uses of water in different situations, the effect of the public trust doctrine differs in each situation in which it is applied.²⁰ In the present situation, where anadromous fish and fish populations are influenced by a variety of factors and where projects operated by YCWA have had both beneficial and harmful effects on fish in the lower Yuba River, it would be unreasonable to charge YCWA with full restoration of conditions that benefited the fisheries that once existed on the Yuba River. However, it is reasonable to require YCWA to regulate its diversions and releases of water in a manner that protects the remaining fish and fish habitat to the extent feasible. Sections 8.0 through 8.4 below discuss the effects of the revised instream flow requirements on YCWA's use of water for other purposes.²¹ Section 8.3.2 addresses the relationship between the revised instream flow requirements and generation of hydroelectric power. As discussed in 8.3.2, the SWRCB concludes that in view of the current power shortages in California, the public interest in maintaining flexibility for hydroelectric power generation justifies deferring the effective date of the long-term instream flow requirements established in this decision for a period of five years. During that period, this decision requires compliance with lower instream flow requirements on an interim basis. This decision provides a reasonable balance and protection of competing uses, including public trust uses, in accordance with the physical solution doctrine and the mandate of article X, section 2 of the California Constitution to maximize reasonable and beneficial uses of water.²²

²⁰ See Gregory S. Weber, *Articulating the Public Trust: Text, Near Text and Context*, 27 Arizona Law Review 1155, 1241). In explaining why it is unlikely that the courts will develop a specific set of "rules" for application of the public trust doctrine, the author stresses that each diversion presents different water use alternatives and each ecosystem presents unique trust characteristics thereby making it likely that the decision in each case will depend upon circumstances unique to that case.

²¹ Protection of public trust resources in other instances has had a relatively greater effect on the availability of water for competing uses. Protection of fish and other public trust resources in the Mono Basin, for example, is expected to result in an estimated reduction in diversions to the City of Los Angeles by a long-term average of approximately 43,700 acre-feet per year. (SWRCB Decision 1631, p. 164.) In Marin County, revised instream flow requirements for protection of fish in Lagunitas Creek reduced the amount of water available for diversion for municipal use in Marin Municipal Water District by between 1,650 and 2,000 acre-feet per year in a water short area where the cost of replacement water ranged from \$350 to \$1,800 per acre-foot. (SWRCB Order WR 95-17, pp.102-105.)

²² The physical solution doctrine is based upon the constitutional goal of promoting maximum beneficial use of the State's water resources. Previous SWRCB decisions discuss application of the physical solution doctrine as a basis for (continued next page)

5.3 Water Code Sections 1243 and 1253

Water Code section 1243 provides:

"The use of water for recreation and preservation and enhancement of fish and wildlife resources is a beneficial use of water. In determining the amount of water available for appropriation for other beneficial uses, the board shall take into account, whenever it is in the public interest, the amounts of water required for recreation and the preservation and enhancement of fish and wildlife resources."

Water Code section 1253 states:

"The board shall allow the appropriation for beneficial purposes of unappropriated water under such terms and conditions as in its judgment will best develop, conserve, and utilize in the public interest the water sought to be appropriated."

As discussed in Sections 5.1 and 5.2 above, the state has continuing authority to regulate water use under the public trust doctrine and the reasonable use provisions of the California Constitution. In addition to other applicable statutes, exercise of the SWRCB's continuing authority over water diversion and use is guided by the legislative directives of Water Code sections 1243 and 1253.

6.0 PROTECTION OF FISHERY RESOURCES IN THE LOWER YUBA RIVER

6.1 Anadromous Fish Occurring in the Lower Yuba River

As discussed in Section 4.3 above, the California Legislature has established [the](#) state policy in support of protection and restoration of natural stocks of chinook salmon and steelhead. (Fish and Game Code § 6900 et seq.) In the lower Yuba River, the primary species of concern identified by DFG, USFWS, and the NMFS are fall and spring-run chinook salmon and steelhead trout. (DFG 26, p. 1; R.T. I, 187:17-187:25; R.T. II, 63:5-63:15; R.T. III, 94:18-95:3; S-NMFS 1A; S-DOI 7; S-DFG 1; S-DFG 13; S-DFG 27; S-R.T. 123:15-124:2; S-R.T. 252:18-253:21; S-R.T.

1952:19-1953:4.) Fall-run chinook salmon are the most abundant anadromous fish in the lower Yuba River and support significant sport and commercial fisheries. (DFG 26, p. 7.) The Central

[establishing a flow regime for protection of fish in which the required release of water from a reservoir at a particular time may exceed the rate of inflow to the reservoir. \(See Decision 1631, p. 10 and Water Right Order, WR 90-16.\)](#)

Valley fall-run chinook salmon is identified as a candidate species under the federal Endangered Species Act. (S-NMFS 4, p. 50394.) Central Valley spring-run chinook salmon, which occur in the lower Yuba River, have been listed as a threatened species under both the state and federal Endangered Species Acts, due to significant population declines throughout its range.

(S-NMFS 1a; S-NMFS 4; S-DFG 13, p. 1.) Central Valley steelhead trout, which occur in the lower Yuba River, have been listed as threatened under the federal Endangered Species Act, also due to significant population declines. (S-NMFS 1a, S-NMFS 7.) In addition, DFG is concerned with protection of the American shad fishery in the lower Yuba River. (DFG 26, p. 1.)

New Bullards Bar and Englebright reservoirs also support significant fishery resources. In accordance with Legislative directives and policy of the Fish and Game Commission, however, DFG places a greater emphasis on protection of anadromous species in the lower Yuba River than on protection of the reservoir fisheries. (R.T. II, 168:18:169:24.) Figure 3 shows the reaches of the lower Yuba River used by anadromous fish, as defined in the DFG anadromous fish studies. Figure 4 identifies periods during the year when the various species of anadromous fish are present, and Figure 5 shows the sections of the river used during the various life stages of each species. Anadromous fish occurring in the lower Yuba River include fall-run chinook salmon, late fall-run chinook salmon, spring-run chinook salmon, steelhead, and American shad. The life history of each of these species is summarized below.

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FIGURE 3 - Lower Yuba River

FIGURE 4 – Periods when lifestages of various species of fish are present in lower Yuba River

FIGURE 5 – Sections of lower Yuba River used by lifestages of various species of fish

6.1.1 Fall-Run Chinook Salmon

Fall-run chinook salmon are the most abundant anadromous fish in the lower Yuba River. Central Valley fall-run chinook salmon support significant sport and commercial fisheries. The Sacramento River system, of which the Yuba River is a part, has historically been an important spawning area for fall-run chinook salmon. In the past, the Yuba River supported up to 15 percent of the annual run of fall chinook in the Sacramento River system. (DFG 26, p. 7.)

Fall-run adults typically migrate into the lower Yuba River from late September through January, with peak adult migration occurring in late October and November. Low flows and high water temperatures may delay upstream migration and spawning in the lower Yuba River. (DFG 26, p. 7; S-YCWA 51; S-R.T. 2635:23-2638:13.) Spawning can begin as early as October 1. (R.T. I, 129:9-129:16; S-YCWA 51.) Normally, spawning begins in mid-October with peak spawning during November and December. (DFG 26, pp. 7 and 62.) [During spawning, salmon construct redds \(nests\) in the gravel where they deposit their eggs.](#) Eggs incubate in the gravel into February, followed by hatching and emergence of fry into March. (DFG 26, p. 9.) Fry may emigrate within a few weeks of emergence while others may rear in-river as late as June before emigrating as smolts. (DFG 26, p. 9; YCWA 20, Fig. 3-4; R.T. II, 16:7-17:4; R.T. III, 20:14-24:5; R.T. VIII, 57:13-59:14.)

Spawning habitat occurs from the lower end of the Narrows Reach downstream to about two and one-half miles below the Marysville gage. (DFG 26, pp. 62, 65-66.) Generally, about 60 percent of the fall-run chinook salmon spawn between the Highway 20 bridge and Daguerre Point Dam, but from 1975 to 1979, most spawning occurred downstream of Daguerre Point Dam. (DFG 26, p. 7; R.T. I, 60:5-60:6; YCWA 80, DFG November 18, 1980 memo.) Fry utilize all reaches of the lower Yuba River downstream of the Narrows Reach for rearing. The largest concentration appears to be upstream of Daguerre Point Dam in the Garcia Gravel Pit Reach.(DFG 26, p. 26.)

6.1.2 Late Fall-Run Chinook Salmon

Although late fall-run chinook salmon occur primarily in the upper Sacramento River, incidental populations are known to occur in the lower Yuba River. (R.T. II, 245:8-245:20; R.T. III, 24:7-24:20; USFWS 7, p. 5.) Adult late fall-run chinook salmon migrate into fresh water from January into March. Spawning and egg incubation occur from January into June. Fry emigration, juvenile rearing and juvenile emigration occur from April into December. (R.T. II, 245:8-245:20; USFWS 7, p. 5.) Spawning and nursery areas preferred by late fall-run chinook salmon are expected to be similar to steelhead since both species enter the river about the same time and rearing occurs through the summer. Some spawning activity has been observed in the Yuba Goldfields area downstream of Daguerre Point Dam. (USFWS 7, p. 5.)

6.1.3 Spring-Run Chinook Salmon

Adult spring-run chinook salmon migrate into the lower Yuba River from March through June or July (DFG 26, p. 10; S-R.T. 1949:11-[1949:12](#).) Peak migrations occur in May and June. (DFG 26, p. 11.) Adults spend the summer in deep pools in the Narrows Reach and spawn primarily from late September through early November. (DFG 26, p. 11.) In recent years, spring-run spawning has been observed to begin approximately the second week of September. (S-DFG 8; S-DFG 9; S-R.T. 1949:17-1949:19.) Spawning occurs within the Garcia Gravel Pit Reach, downstream to Daguerre Point Dam. Most spawning occurs in the upper end of the reach, above the Highway 20 Bridge. (S-DFG 8; S-DFG 9.) Fry emergence begins in November and extends through January. Some fry emigrate within a few weeks of emergence while others may remain until June when they emigrate as juveniles. (DFG 26, p. 11.) Rearing occurs from the upper end of the Garcia Gravel Pit Reach downstream to the mouth of the lower Yuba River. (DFG 26, pp. 26, 62-66.)

6.1.4 Steelhead

The lower Yuba River supports natural production of steelhead and is managed by DFG as a naturally sustained population. DFG's [1996](#) Steelhead Restoration and Management Plan for California (1996) states that the Yuba River supports "essentially the only wild steelhead fishery

remaining in the Central Valley²² (S-DFG 29, p. 47.) Adult steelhead migration into the lower Yuba River begins as early as August and may extend through March. Peak migration occurs from October through February and spawning occurs from January through April. Emergence of fry from the gravel extends into early June and the young fish remain in the river from one to three years prior to emigrating as "yearlings." Emigration of yearlings occurs from March into June. (DFG 26, pp. 11 and 12.) In addition to migration of adults into the lower Yuba River, "half pounder" steelhead are known to migrate into the river from late June into the winter months. (DFG 26, p. 12.) A "half pounder" is a steelhead that returns from the ocean before it is sexually mature. The best spawning habitat for steelhead occurs in the Daguerre Point Dam and Garcia Gravel Pit Reaches. (DFG 26, p. 153.) Side channels may also provide spawning habitat. (R.T. III, 120:17-121:13.) Rearing occurs from the Garcia Gravel Pit Reach downstream to Marysville. (DFG 26, p. 63.)

6.1.5 American Shad

American shad typically begin migrating into the Feather River system and the Yuba River from late April through June. (R.T. I, 183:20-184:14; YCWA 20, pp. 3-8 to 3-9; YCWA 73, p. 41.) Spawning occurs downstream of Daguerre Point Dam because the fish ladders at the dam are impassable to American shad. (R.T. I, 80:21-80:25.) Spawning typically occurs from late May through July. Shad spawn in schools near the water surface, usually at night. Shad eggs are semi-buoyant and non-adhesive. They drift downstream with the current until they gradually sink to the bottom. Incubation takes three to six days and newly hatched larvae may be rapidly transported downstream. (DFG 26, pp. 13 and 14.) Few juvenile American shad are seen in the lower Yuba River after October. (R.T. II, 59:20-60:16.)

6.2 Factors Affecting Anadromous Fish Populations in the Lower Yuba River

Based on information in the DFG Fisheries Management Plan (DFG 26), the USFWS Draft Restoration Plan for the Anadromous Fish Restoration Program (S-DOI-4), and other studies and analyses, DFG, USFWS, NMFS, and other parties have recommended revision of permit requirements governing: (1) minimum flows in the lower Yuba River, (2) rate of streamflow

fluctuations, (3) water temperature, and (4) screening of water diversion facilities. The evidence and our conclusions regarding these subjects are addressed in this decision. The DFG Fisheries Management Plan and the USFWS Draft Restoration Plan also identify a number of other fishery protection and enhancement measures that can more appropriately be implemented by the actions of other agencies. (DFG 26; S-DOI 4.)

In addition to the subjects addressed by provisions of this decision, YCWA and SYWD identified a number of out-of-basin environmental factors that could affect fish populations in the lower Yuba River including: (1) ocean commercial and sport fishing; (2) fishery hatchery practices; (3) flows, temperatures, and diversions in the Feather and Sacramento Rivers; (4) Sacramento-San Joaquin Delta water temperatures and water exports; (5) dam construction on other streams tributary to the Sacramento-San Joaquin Delta; and (6) introduction of exotic species of fish. (SYWD 20, pp. 16-18; YCWA 20, pp. [2-13]-[2-22]; R.T. VIII, 37:17-50:6; R.T. X, 205:10-207:19; S-YCWA 19, pp. [3-12]-[3-14]; S-R.T. 589:9-590:6.) Modification or regulation of out-of-basin factors goes beyond the issues under consideration in this proceeding and, in some cases, beyond the jurisdiction of the SWRCB. Many of the issues associated with water diversions and flows in the Sacramento-San Joaquin Delta fishery are under consideration by the SWRCB in a separate proceeding.

6.3 Status of Anadromous Fish Populations in the Lower Yuba River

Fall-Run Chinook Salmon: DFG projected that, following construction of New Bullards Bar, average annual spawning runs of adult fall-run chinook salmon would increase from around 13,000 to 38,000. However, spawning information from 1953 to 1989 presented in 1992 indicated that post-project populations of fall-run chinook salmon remained at approximately 13,000 adults. (DFG 26, p. 7; R.T. I, 235:18-235:24, 237:22-238:8.)

YCWA presented testimony in 2000 that the average fall-run spawning escapement in the lower Yuba River was higher in the post-New Bullards Bar Reservoir period (1972-1999) than in the pre-project period (1953-1971). (S-YCWA 19, p. 3-9; S-YCWA 43; S-R.T. 572:20-573:23.)

However, no evidence was presented on the statistical significance of this population increase. (S-R.T. 2707:16-2709:22.) In addition, DFG presented testimony that the rate of increase in the fall-run population prior to operation of New Bullards Bar (1953-1971) was actually higher than the rate of increase in the post-project period (1972-1999). (S-DFG 41; S-R.T. 2436:3–2437:11.)

Due to concerns over population declines of Central Valley fall-run chinook in the Sacramento-San Joaquin River system as a whole, the species has been designated as a candidate species under the federal Endangered Species Act. (S-NMFS 4, p. 50394.)

Late Fall-Run Chinook Salmon: Small numbers of late fall-run chinook are known to spawn in the lower Yuba River. (R.T. II, 245:8 – 245:20; R.T. III, p. 24:9-24:21; USFWS 7, p. 5.) However, no population estimates exist for late fall-run chinook for either the pre- or post-New Bullards Bar Reservoir periods. (R.T. III, 24:7-24:20.)

Spring-Run Chinook Salmon: Historically, spring-run chinook salmon were the dominant race of salmon in the Yuba River. The combination of fish passage problems at Englebright Reservoir and Daguerre Point Dam, together with water temperature problems downstream of Englebright Reservoir during spawning periods, led to the virtual disappearance of spring-run chinook salmon by 1959. (DFG 26, p. 9; R.T. I, 236:5-236:23; YCWA 20, p. 2-12; R.T. VIII, 23:6-23:23.)

The restoration of fish passage at Daguerre Point Dam allowed reestablishment of small numbers of spring-run chinook in the lower Yuba River. In addition, the cooler summer water temperatures resulting from construction of New Bullards Bar Reservoir may have improved habitat for spring-run in the lower Yuba River. In 2000, YCWA presented testimony that flows and water temperature conditions following construction of the reservoir have contributed to the recovery of spring-run chinook salmon. (S-YCWA 19, p. 3-12; S-R.T. 646:2-646:11.)

In 1992, [USFWS](#) presented testimony that the estimated population of spring-run chinook salmon spawners in the lower Yuba River at that time was approximately 1,000. (R.T. III, 110:1-111:12.)

In 2000, DFG presented testimony that, based on their best professional judgment, DFG personnel estimated spring-run chinook salmon populations during the 1980's to number several hundred fish. (S-DFG 15, p. VI-20; S-R.T. 1962:21-1962:23.) However, there have been no accurate surveys of spring-run chinook salmon in the lower Yuba River and the current population size and population trends are unknown. (S-R.T. 2145:17-21.)

Spring-run chinook salmon populations in the mainstream Sacramento River and its tributaries are generally at low levels, which led to designation of Central Valley spring-run chinook salmon as threatened under both the federal Endangered Species Act and the California Endangered Species Act. (S-NMFS 2; S-NMFS 3; S-NMFS 4; S-DFG 13, S-DFG 15, S-DFG 17 to S-DFG 24; S-R.T. 1962:24-1963:4.)

Steelhead: Prior to construction of New Bullards Bar Reservoir in 1969, high water temperatures in the lower Yuba River limited steelhead populations to approximately 200 adults. (DFG 26, p. 11; YCWA 20, p. 2-12; PG&E 2, p. 6.) In 1992, DFG and YCWA presented limited data that recent populations of steelhead may have increased since the completion of New Bullards Bar. (DFG 26, p. 11; YCWA 69 and 70.) In 2000, YCWA presented testimony that flows and water temperature conditions following construction of the reservoir have contributed to the recovery of steelhead. (S-R.T. 646:2-646:11.) The steelhead run size in the Yuba River in 1984 was estimated to be about 2,000 fish. (S-DFG 29, p. 47.) However, no definitive population estimates exist for steelhead in the lower Yuba River and the current status of the population is unknown. (DFG 26, p. 11; S-R.T. 2248:23 – 2251:25.) Steelhead stocks of the Central Valley are generally at low levels which led to designation of steelhead as threatened under the federal Endangered Species Act in 1998. (S-NMFS 5; S-NMFS 6; S-NMFS 7; S-DFG 27; S-DFG 29; S-DFG 30.)

American Shad: American shad were introduced into the Sacramento River from the East coast in 1871 and quickly became established in the San Joaquin and Sacramento River Systems. American shad populations are now found in the upper Sacramento, American, Feather, and Yuba rivers. (R.T. II, 240:15-243:10.) Shad populations in the lower Yuba River in 1968 and 1969

were estimated to range from 30,000 to 40,000 adults. (DFG 26, p. 13.) During 1976, 1977, 1981, 1987, and 1988, when mean flows in May ranged between 166 cfs and 367 cfs, there were no significant shad runs up the Yuba River. Better shad runs have occurred during years with higher flows during May. (YCWA 20 p. 3-22; CSPA Exhibit CC.)

Summary: Daguerre Point Dam interferes with migration of anadromous fish and Engelbright Dam blocks upstream passage entirely. Both dams were present prior to construction of New Bullards Bar, but YCWA makes use of both facilities as part of its ongoing operations. Due to the loss of anadromous fish habitat upstream of Englebright Reservoir, maintenance of the remaining habitat in the lower Yuba river is particularly important. Although the cooler water at upstream locations is no longer accessible to anadromous fish, the multi-level outlet at New Bullards Bar Dam was built to increase the ability to provide cool water in the lower Yuba River. (See Sections 6.6 through 6.6.5.) The record indicates that overall populations of fall-run chinook salmon have not changed significantly since construction of New Bullards Bar Reservoir. The reservoir may have improved habitat for spring-run chinook salmon and steelhead in the lower Yuba River, but the population effects are unknown. As discussed in Section 6.5.7 below, the number of American shad entering the Yuba River to spawn is related to the ratio between flows in the Yuba and Feather Rivers during the late April through June upstream migration period.

6.4 Adequacy of Existing Streamflow and Temperature Requirements

The minimum flows currently specified in Water Right Permits 15026, 15027, and 15030 are based on a 1962 agreement between YCWA and DFG. The 1962 agreement was superseded by a later agreement between the same two agencies signed in 1965. (DFG 26, p. 195.) Although YCWA's water right licenses covering hydropower generation were amended to include the 1965 agreement flows, its water right permits for consumptive use were not amended to reflect the 1965 agreement. Prior to entering the 1965 agreement, DFG initiated studies in 1960 to determine the minimum flows necessary to protect salmon in the lower Yuba River, but the studies were never completed. (R.T. XIII, 68:1-71:10, 78:19-79:17.) DFG presented evidence that production of

anadromous fish in the lower Yuba River has been limited by flow and water temperature criteria specified in the 1965 agreement. (DFG 26, pp. 7-14; R.T. I, 40:18-40:25 and 60:23-60:25.)

The adequacy of the 1965 agreement flows was also questioned by the USFWS who presented written testimony that the flow regimes identified in the 1965 agreement "would likely provide poor habitat for chinook salmon reproduction and the population would decline measurably." (USFWS 8, p. 3.) A USFWS fisheries biologist expressed concern about future flow conditions on the lower Yuba River and testified that if project operations were to strictly adhere to the minimum flow regime prescribed by the 1965 agreement, "the resulting habitat conditions would be extremely detrimental to all anadromous salmonid populations in the Yuba River." (R.T. III, 95:9-95:21, 105:5-105:23.)

The Department of Interior's Anadromous Fish Restoration Program (AFRP) identified flows needed in the lower Yuba River and other Central Valley streams to achieve the federal government's fish restoration goals. (S-DOI 7, p. 1.) The AFRP "Working Paper on Restoration Needs" (May 1995) identified flows for the lower Yuba River that are consistent with flows recommended by DFG's 1992 Lower Yuba River Management Plan. (DFG 26, pp. 107-114; S-DOI 3, pp. [3-Xc-12]-[3-Xc-17]; S-DOI 7, pp. 1-2; S-R.T. 248:19-249:9.) The 1997 Revised Draft Restoration Plan for the Anadromous Fish Restoration Program identifies several restoration actions for the lower Yuba River, including supplementing instream flows to improve habitat and water temperature conditions, reducing flow fluctuations, and improving fish screening and fish passage facilities. (S-DOI 4.) [The goal of the AFRP is to increase natural production of a anadromous fish in Central Valley streams to double their 1967-1991 levels. \(S-DOI 3; S-DOI 4, p. 4.\)](#)

CSPA presented evidence that a DFG biologist questioned the adequacy of the 1965 agreement flows prior to execution of the agreement. His concern was reduced, however, due to the expectation that actual project operations would provide substantially more flow than required by the agreement. Peak releases for power were expected to exceed 2,000 cfs starting April 1 under

terms of the power contract between PG&E and YCWA. The DFG biologist continued to be concerned, however, about the adequacy of the 245 cfs minimum flow requirement during the rearing and emigration period for juvenile salmon. (R.T. XIII, 72:2-76:17; CSPA Exhibit A, DFG memo dated December, 17, 1965.)

CSPA also presented testimony by a former DFG fishery scientist who worked on the incomplete DFG study in 1960 and 1961. The witness testified that the flows in the 1965 agreement did not take American shad into consideration and that the specified flows were "woefully" inadequate for salmon. (R.T. XIII, 76:19-80:15.) In 2000, YCWA presented testimony that the lower Yuba River fall-run chinook salmon and resident native and introduced fish resources are currently in "good condition." (S-YCWA 19, p. 5-2; S-R.T. 644:15-645:18.) However, average flows in the lower Yuba River since completion of New Bullards Bar in 1970 have generally been substantially in excess of the minimum flows specified in the 1965 agreement between YCWA and DFG.

Therefore, historic fishery data provide no basis for concluding that the minimum flows required under the 1965 agreement would be adequate to keep fall-run chinook salmon in good condition. As indicated by their status under the endangered species acts, the spring-run chinook salmon and steelhead populations are not considered to be in good condition.

There was no expert testimony presented by any party that a flow regime that strictly adhered to the requirements of the 1965 Agreement would provide suitable protection for lower Yuba River fisheries. The instream flow recommendations in the DFG Fisheries Management Plan are much higher than the minimum flows required in the 1965 Agreement. In 2000, YCWA also proposed significantly higher instream flow releases for fishery purposes than are required in the 1965 Agreement. (S-YCWA 19, p. 4-1.)

6.5 Instream Flows for Protection of Fishery Resources

Chinook salmon, steelhead trout, and American shad populations in the lower Yuba River depend on adequate flows downstream of Englebright Reservoir and Daguerre Point Dam to provide habitat for adult attraction and passage, spawning, egg incubation, juvenile rearing, and

emigration. The quantity and timing of flows needed for these purposes are evaluated in Sections 6.5.1 through 6.5.9 below.

6.5.1 Physical Habitat Needs (IFIM/PHABSIM Model)

To evaluate and quantify the relationship between fish habitat and flow, DFG initiated a study in 1986 utilizing the USFWS's computer based Instream Flow Incremental Methodology/Physical Habitat Simulation Model (IFIM/PHABSIM). (DFG 26, pp. 65-70; R.T. I, 100:6-103:15.) The IFIM/PHABSIM modeling process is used to identify the incremental relationship between streamflow and habitat. The method combines information on habitat preference and stream hydraulics to develop a streamflow-habitat relationship index called Weighted Usable Area (WUA). Changes in WUA generally represent changes in the availability of aquatic habitat, provided other factors such as water temperature and food supply are adequate. DFG used the IFIM/PHABSIM methodology to determine the relationship between habitat and streamflow for the various life stages of chinook salmon and steelhead in the lower Yuba River. The IFIM/PHABSIM methodology was not used to develop similar information for American shad. (DFG 26, p. 80.)

Field studies were conducted in the lower Yuba River to develop microhabitat use criteria for various life stages of chinook salmon, steelhead trout, and American shad. Sufficient data were collected through direct observation to describe habitat use for fry, juvenile, and spawning adult chinook salmon. Insufficient numbers of steelhead and American shad were observed to allow development of habitat criteria for these species. (DFG 26, pp. 31-44.) [DFG did not develop WUA discharge relationships for American shad. \(DFG 26, p. 80.\)](#) Microhabitat use criteria for steelhead lifestages were based on published data. (DFG 26, p. 41.) With the results of the PHABSIM analysis, DFG attempted to identify flows that would be feasible and would provide adequate habitat for each lifestage of ~~the target species~~ [chinook salmon and steelhead](#). (R.T. I, 48:9-48:18.)

6.5.2 Results of the DFG IFIM/PHABSIM Study

Fall-Run Chinook Salmon: The period from mid-October into March is characterized by fall-run chinook salmon spawning, egg incubation, fry emergence and fry rearing. The IFIM results for total spawning habitat presented by DFG show that a flow of 700 cfs in the Garcia Gravel Pit Reach above Daguerre Point Dam maximizes total spawning habitat in that reach. (DFG 26, p. 133, Table II-4a.) The DFG data also show that maximum spawning habitat in the reach of the river below Daguerre Point Dam would be provided by a flow of approximately 450 to 500 cfs. (DFG 26, p. 133, Table II-4a.)

Fall-run chinook fry rearing occurs from December into May. Fry are common in run/glide, shallow pool, deep pool and riffle habitat. (DFG 26, p. 29.) The greatest concentration of the habitat types used for rearing is in the Garcia Gravel Pit Reach, the Daguerre Point Dam Reach and the Simpson Lane Reach. (DFG 26, p. 68.) Maximum fry rearing habitat in these three reaches would occur at a flow of 100 cfs, provided that water temperature and other requirements are met. (DFG 26, p. 131, Table II-2a.)

Fall-run chinook juvenile rearing occurs from April into June. (DFG 26, p. 29.) The greatest concentration of juvenile rearing habitat is in the Garcia Gravel Pit Reach, followed by the Daguerre Point Dam Reach and the Simpson Lane Reach. (DFG 26, p. 68.) The maximum habitat for juvenile rearing in the lower Yuba River would be provided at a flow of 150 to 200 cfs. (DFG 26, p. 132, Table II-3a.)

Late Fall-Run Chinook Salmon: Late fall-run chinook salmon have a similar life history to fall-run chinook salmon and steelhead. Although late fall-run chinook habitat was not modeled, it is reasonable to assume that the flow recommendations based on the IFIM/PHABSIM model results for fall-run chinook salmon and steelhead would also benefit late fall-run chinook salmon.

Spring-Run Chinook Salmon: DFG assumed that the IFIM/PHABSIM model results for fall-run chinook salmon are applicable to spring-run chinook salmon. (DFG 26, p. 71.) Spring-run

chinook salmon spawning, egg incubation and fry emergence occurs from late September through January. Spawning occurs from late September to early November within the Garcia Gravel Pit Reach, downstream to Daguerre Point Dam. (S-DFG 8; S-DFG 9.) Fry and juvenile rearing occur from the upper end of the Garcia Gravel Pit Reach downstream to the mouth of the lower Yuba River. Fry rearing occurs from January through March; juvenile rearing occurs from March through June. (DFG 26, pp. 7-14, 26, 62-66.)

A flow of 700 cfs in the Garcia Gravel Pit Reach above Daguerre Point Dam maximizes total spawning habitat in that reach. (DFG 26, p. 133, Table II-4a.) Maximum fry rearing habitat in the Garcia Gravel Pit, Daguerre Point Dam, and Simpson Lane reaches would occur at a flow of 100 cfs, provided that water temperature and other requirements are met. (DFG 26, p. 131, Table II-2a.) Maximum habitat for juvenile rearing in these reaches would be provided at a flow of 150 to 200 cfs. (DFG 26, p. 132, Table II-3a.)

Steelhead: Steelhead spawning, egg incubation, and fry emergence occurs from January into early June. A flow of 700 cfs would provide maximum spawning habitat in the reach above Daguerre Point Dam while a flow of 500 cfs would provide maximum habitat below Daguerre Point Dam. (DFG 26, p. 153, Table III-4a.)

Steelhead fry and juvenile rearing occurs throughout the year in all habitat types. (DFG 26, pp. 28 and 29.) Species distribution data for January and May indicate that young steelhead concentrate in the Garcia Gravel Pit Reach with lower numbers also observed in the Daguerre Point Dam Reach. (DFG 26, p. 26.) Flows of 100 cfs and 350 cfs would provide maximum fry and juvenile rearing habitat respectively in the Garcia Gravel Pit reach, provided water temperature and other requirements are met. (DFG 26, p. 151, Table III-2a and p. 152, Table III-3a.) Fry and juvenile rearing habitat in the Daguerre Point Reach would be maximized by flows of 150 and 250 cfs respectively. (DFG 26, p. 151, Table III-2a and p. 152, Table III-3a.)

American Shad: The IFIM/PHABSIM study was not used to establish a habitat streamflow relationship for American shad. American shad spawning occurs in the Daguerre Point Dam and Simpson Lane Reaches from late May through July. Egg incubation and rearing of fry and juvenile shad occurs in the Simpson Lane Reach from late May into November.

6.5.3 YCWA Evaluations of Instream Flow Study Relationships

In 1992, YCWA presented evidence questioning DFG's interpretation of the IFIM/PHABSIM model results. (YCWA 20, p. 3-3 and Appendix A.) YCWA described DFG's use of the model results as "fatally flawed" because DFG did not consider seasonal effects of tributary inflow from Dry Creek and Deer Creek or irrigation diversions at Daguerre Point Dam. YCWA reevaluated the model results and concluded that maximum habitat for the various life stages of salmon would be achieved with different streamflows above and below Daguerre Point Dam. YCWA's use of habitat curves also differed from the approach taken by DFG. In 2000, YCWA provided additional testimony on flow-habitat relationships for chinook salmon and steelhead. (S-YCWA 19, pp. [3-26]–[3-29].) Despite the different approaches, however, YCWA's approach led to the conclusion that maximum habitat is available at essentially the same streamflows shown by the DFG analysis. (See Table 4 below.)

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TABLE 4
COMPARISON OF STREAMFLOWS NEEDED TO PROVIDE
MAXIMUM HABITAT FOR CHINOOK SALMON
(CFS)

LIFE STAGE	GARCIA GRAVEL PIT REACH			DAGUERRE POINT DAM REACH		
	DFG*	YCWA** (1992)	YCWA*** (2000)	DFG*	YCWA** (1992)	YCWA*** (2000)
Spawning	700	700	700-800	450	400-550	450-525
Fry	100	100	100-150	100	100	100-150
Juvenile	150	150	150-250	200	200	150-250

Table Notes:

* DFG 26, pp. 131-133

** YCWA 20, p. 3-3 and Appendix A, presented in 1992

*** S-YCWA 19, pp. [3-26] to [3-29], presented in 2000

Although there is little difference in the available habitat results developed by YCWA and DFG, the YCWA approach demonstrates the benefits of separately examining the fishery habitat available in the reaches above and below Daguerre Point Dam. Data in Table 4 above show that, for some life stages, optimum habitat would be provided at different flows in the sections of the river above and below the dam. (YCWA 20, p. 3-3 and Appendix A; S-YCWA 19, pp. [3-26]–[3-29].)

6.5.4 Minimum Streamflow Recommendations in 1992

In 1992, DFG presented comprehensive flow recommendations for fishery protection in the lower Yuba River that were supported by USFWS, CSPA, and Walter Cook. (R.T. III, 97:13-97:22; 105:19-106:3; R.T. III, 173:19-174:11; R.T. XIV, 179:1-179:13; R.T. XIII, 80:3-81:4; R.T. XII, 76:2-76:9.) DFG's recommended flows for protection of salmon, steelhead, and American shad in normal and wet years are shown in Table 5 below.

TABLE 5

**DFG'S RECOMMENDED MINIMUM MEAN DAILY
STREAMFLOWS FOR NORMAL AND WET YEARS (1992)**

Time Period	Flow at Marysville Gage (cfs)
October 1 - March 31	700
April 1 - April 30	1,000
May 1 - May 31	2,000
June 1 - June 30	1,500
July 1 - September 30	450

The above recommendations were based partially on the IFIM analysis and partially on other factors including: juvenile salmon emigration flows, American shad attraction flows, water temperature concerns, historic flow patterns, and professional judgment. In dry years, DFG recommended that reductions in the flows specified above be done "equitably" with the same percentage reductions in instream flows and diversions for offstream uses. DFG recommended that such reductions be based on water available to permanent contracts existing on January 1, 1990. Under the DFG recommendation, diversions based on post January 1, 1990 contractual obligations would be reduced to zero before reductions in fishery flows would occur. (DFG 26, pp. xiii and 113; R.T. II, 176:1-177:13.)

DFG defined a dry year as less than 50 percent of the 50-year average unimpaired runoff in acre-feet at Smartville for the current water year as published annually in the May 1 Report of Water Conditions in California by the California Department of Water Resources. For the 63-year period of estimated unimpaired streamflows at Smartville (1921 through 1983), ten years would be classified as "dry" using the criteria proposed by DFG. (DFG 26, p. 22.)

6.5.5 1996 SWRCB Draft Decision Instream Flow Requirements

In 1996, SWRCB staff completed a Draft Decision that proposed new instream flow requirements for the protection of fish for the lower Yuba River. Flow requirements in the 1996 Draft Decision are shown in Tables 6 and 7 below. For purposes of the Draft Decision, "dry year" criteria were defined as recommended by DFG in 1992.

TABLE 6

**SWRCB 1996 DRAFT DECISION
MINIMUM AVERAGE DAILY STREAMFLOW
REQUIREMENTS IN THE LOWER YUBA RIVER
FOR NORMAL AND WET YEARS (cfs)**

Period	Marysville Gage	Smartville Gage
October 15 - April 20	500	700
April 21 – April 30	1,000	-
May 1 – May 31	2,000 +	-
June 1	1,400 0	-
June 2	980	-
June 3 – June 30	800	-
July 1	560	-
July 2	390	-
July 3 – October 14	250	-

TABLE 7

**SWRCB 1996 DRAFT DECISION
MINIMUM AVERAGE DAILY STREAMFLOW
REQUIREMENTS IN THE LOWER YUBA RIVER
FOR DRY YEARS (cfs)**

<u>Period</u>	Marysville Gage	Smartville Gage
October 15 - April 20	500	700
April 21 – April 30	1,000	-
May 1 – May 31	1,100	-
June 1 – June 30	800	-
July 1	560	-
July 2	390	-
July 3 - October 14	250	-

6.5.6 Minimum Streamflow Recommendations in 2000

In 2000, DFG presented testimony that adoption of the 1996 SWRCB Draft Decision would provide a significant improvement in flows, water temperatures, and resultant habitat conditions for anadromous fish in the lower Yuba River compared to the requirements in the 1965 agreement. DFG also presented testimony that the recommendations in the Draft Decision are the minimum that should be implemented immediately, with additional provisions for water temperatures, and flow fluctuations and reductions. (S-DFG 1, p. 1; S-R.T. 1944:19-1944:23.)

NMFS recommended that the minimum flow provisions of the 1996 Draft Decision be adopted immediately, with additional provisions for spring-run chinook spawning flows, outmigration studies, water temperatures, and flow fluctuations and reductions. (S-NMFS 1A, pp. 5-8; S-R.T. 125:19-127:23.)

USFWS presented testimony that the minimum flow requirements in the 1996 Draft Decision represent appreciable improvement and that the SWRCB has adequate information to adopt the Draft Decision immediately. (S-R.T. 245:20-22.) However, the USFWS urged the SWRCB to implement the flows in the Anadromous Fish Restoration Program Working Paper which are consistent with the flows in the 1991 Fisheries Management Plan. (S-DOI 3; S-DOI 7; S-DOI 8; S-R.T. 245:23-251:13.)

CSPA recommended higher instream flow requirements for the lower Yuba River based on an analysis of the required flows in the lower American River and a comparison between the unimpaired runoff of the American and Yuba River Basins. (S-CSPA 2.)

In 2000, YCWA proposed minimum instream flow requirements, based on consideration of fishery needs, hydrology, and consumptive use needs. (S-YCWA 19, p. 4-1.) YCWA's proposed minimum instream flow requirements are 5-day running averages, with instantaneous flows never to be less than 90% of the applicable requirement. The water year types identified in YCWA's

proposal are defined by the Yuba River Index described in Exhibit S-YCWA 14. YCWA's proposed instream flows are shown in Table 8 below.

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TABLE 8
INSTREAM FLOW REQUIREMENTS PROPOSED BY YCWA
FOR THE LOWER YUBA RIVER (2000)

Time Period	Wet & Above Normal Years (cfs)		Below Normal Years (cfs)		Dry Years (cfs)	
	Smartville Gage	Marysville Gage	Smartville Gage	Marysville Gage	Smartville Gage	Marysville Gage
Sep 15-Oct14	700	250	550	250	500	250
Oct 15-Apr 20	700	500	700	500	600	400
Apr 21-Apr 30	--	1,000	--	900	--	400
May 1-May 31	--	1,500	--	1,500	--	500
Jun 1	--	1,050	--	1,050	--	400
Jun 2-Jun 30	--	800	--	800	--	400
Jul 1	--	560	--	560	--	280
Jul 2	--	390	--	390	--	250
Jul 3-Sep 14	--	250	--	250	--	250
Time Period	Critical Years (cfs)					
	Smartville Gage	Marysville Gage				
Sep 15-Oct14	400	150				
Oct 15-Apr 20	600	400				
Apr 21	--	280				
Apr 22-Apr 30	--	270				
May 1-May 31	--	270				
Jun 1	--	195				
Jun 2	--	140				
Jun 3-Sep 14	--	100				

6.5.7 Analysis of Flows for Fishery Purposes Based on Physical Habitat Requirements

6.5.7.1 Instream Flows in Below Normal, Above Normal, and Wet Water Years

Extensive evidence regarding flows needed for fishery protection in the lower Yuba River was presented during the course of the hearing. As shown in Table 4, there is general consensus on streamflows needed to provide optimum habitat for chinook salmon and steelhead in the lower Yuba River.

In order to account for annual variations in hydrology, we concur with the use of the Yuba River Index developed by YCWA for use in establishing instream flow requirements for the lower Yuba River. (S-YCWA 14.) In analyzing instream flow requirements, consideration must be given to the locations of gaging facilities in relation to fishery habitat needs. There are USGS gages at Smartville and Marysville, but there are no flow measurement gages immediately above and below Daguerre Point Dam. Unmeasured accretions from the Yuba Goldfields augment flows measured at the Marysville gage several miles downstream of Daguerre Point Dam. (YCWA 2, p. 33.) Therefore, if flow measurement at the Marysville gage is relied on to protect habitat throughout the reach between Daguerre Point Dam and Marysville, the flow requirement at Marysville should be set at the upper end of the range of desirable flows. Our conclusions regarding fishery flow requirements for each period of the year are summarized below.

September 15 through mid-April: The primary fishery activities during this period are:

- Spring-run chinook spawning (mid-September through early November)
- Fall-run chinook upstream migration and spawning (late September through January)
- Late fall-run chinook upstream migration and spawning (January through April)
- Steelhead spawning (January through April)
- Egg incubation, fry emergence, fry rearing, and emigration
(all chinook runs and steelhead)

The IFIM model results show that salmon and steelhead spawning habitat is maximized with flows in the Garcia Gravel Pit reach of 700 to 800 cfs, while spawning habitat below Daguerre Point Dam is maximized at lower flows of 500 cfs for steelhead and 400 to 550 cfs for chinook salmon. (Table 3.)

Providing adequate spawning, egg incubation, and rearing habitat for spring-run chinook is essential for the protection and recovery of the species within the range of its designated critical habitat. Spring-run chinook spawning begins in mid-September, but occurs only in the Garcia Gravel Pit Reach above Daguerre Point Dam. (S-DFG 8; S-DFG 9; S-R.T. 1949:17-19.) To provide adequate habitat for spring-run chinook spawning and egg incubation in this reach, the

NMFS recommended a minimum flow of 700 cfs at Englebright Dam beginning the second week of September in all water year types. (S-NMFS 1A, p. 6.) Instream flows proposed by YCWA are 700 cfs in above normal and wet years and 550 cfs in below normal years from September 15 to October 14 in the Garcia Gravel Pit Reach. (S-YCWA 19, p. 4-1.) Based on the evidence presented on the importance of providing adequate habitat for spring-run chinook spawning and egg incubation for recovery of the run, we conclude that a minimum flow of 700 cfs at the Smartville gage should be provided beginning on September 15. For the reasons discussed below, a minimum flow of 700 cfs should be maintained through April 20.

DFG recommended that a flow of 700 cfs also be provided for fall-run chinook spawning beginning October 1 of each year throughout the Garcia Gravel Pit and Daguerre Point Dam reaches. However, the record indicates that fall-run chinook normally do not begin spawning until about October 15. In addition, in the Garcia Gravel Pit Reach, a flow of 700 cfs provides maximum chinook salmon spawning habitat. A flow of 500 cfs provides maximum habitat below Daguerre Point Dam. Therefore, we conclude that flows for fall-run chinook spawning should begin on October 15 rather than on October 1. Beginning October 15, a flow of 700 cfs should be continued in the Garcia Gravel Pit Reach and a flow of 500 cfs should be provided in the Daguerre Point Dam reach. These flows are the same as those recommended by YCWA in below normal, above normal, and wet water years.

Steelhead spawning occurs from January through April in the Garcia Gravel Pit and Daguerre Point Dam reaches. Steelhead spawning habitat is maximized with flows in the Garcia Gravel Pit reach of 700 cfs; spawning habitat below Daguerre Point Dam is maximized with flows of 500 cfs. (DFG-26, p. 153, Table III-4a.) These flows, provided beginning on October 15 for fall-run chinook, should be continued through the steelhead spawning period.

DFG places a higher priority on providing salmonid spawning habitat and maintaining stable flows throughout the egg incubation and early rearing periods than on providing the maximum quantity of rearing habitat for fry and juveniles. (DFG 26, pp. 81-83.) No evidence was presented that the

total quantity of physical rearing habitat for fry and juvenile salmonids is a limiting factor in the lower Yuba River. The flows described above maximize spawning habitat for chinook salmon and steelhead. IFIM study results show that those flows will also benefit incubating salmon and steelhead eggs, but may not provide maximum physical rearing habitat for salmon and steelhead fry and juveniles. (DFG 26, pp. 131, 133, 151 and 153.)

DFG also presented evidence on the importance of maintaining sufficient flows to prevent dewatering of redds and to prevent stranding of juvenile fish. (DFG 26, pp. 81-82.) Chinook salmon redds and nursery habitat for fry commonly occur in shallow water along the edges of the river. Braided side channels provide habitat for spawning steelhead and rearing chinook salmon fry. (R.T. VIII, 120:17-121:13.) Maintaining relatively constant flows through mid-April serves to prevent these habitat areas from being dewatered. Fry and juvenile fish have the option of seeking more suitable rearing habitat downstream and the majority of salmon fry commonly emigrate or redistribute themselves within a few weeks of emergence. (R.T. II, 16:7-17:4; R.T. III, 20:14-24:5; 57:13-58:4.) Eggs in the gravel, however, are much more vulnerable to flow reductions.

Based on the evidence discussed above for the mid-September through mid-April period, we conclude that providing adequate habitat for fall and spring-run chinook salmon and steelhead spawning, and maintaining stable flows through at least the early rearing period for these species, is more important than providing maximum physical habitat for fry and juvenile lifestages. Therefore, we conclude that the minimum flows for fishery protection purposes during September 15 through October 14 of below normal, above normal, and wet water years should be 700 cfs at the Smartville gage and 250 cfs at the Marysville gage. (The 250 cfs requirement will be a continuation of the previous July 3 through September 14 flow requirement, described in detail below.) From October 15 through April 20 of the succeeding year, minimum flows should be 700 cfs at Smartville and 500 cfs downstream of Daguerre Point Dam, measured at the Marysville gage.

Mid-April through June: The primary fishery activities during this period are:

- Spring-run chinook juvenile rearing and emigration (outmigration of young fish), and adult upstream migration and holding²³ (April through June)
- Fall and late fall-run chinook juvenile rearing and emigration (April through June)
- Steelhead egg incubation, juvenile rearing and emigration (April through June)
- American shad upstream migration, spawning, and early rearing (late April through June)

The primary fishery consideration in the April through June period is to provide adequate flows for juvenile chinook salmon and steelhead emigration. No specific studies of flows needed for steelhead or chinook salmon emigration have been conducted in the lower Yuba River. (R.T. I, 212:25-215:15.) The results of the IFIM/PHABSIM analysis are not directly applicable to establishing flows during the spring emigration period.

DFG based its recommended flows of 1,000, 2,000 and 1,500 cfs at the Marysville gage during April, May, and June, respectively, on flow needs for emigration of yearling steelhead and juvenile chinook salmon (fall, late fall, and spring runs), maintenance of preferred water temperatures at the Marysville gage for various life stages of chinook salmon, and attraction and spawning of American shad. (DFG 26, pp. 82-83; R.T. II, 23:1-23:7.)

In the 1995 AFRP Working Paper, the USFWS made the same flow recommendations as DFG for April, May, and June, with the objective of improving conditions for juvenile salmonid rearing and emigration. (S-[USFWS/DOI](#) 3; p. 3-Xc-16.) USFWS presented evidence that lack of suitable juvenile rearing and emigration conditions are factors that currently limit salmonid production in the lower Yuba River. Maintaining appropriate rearing and emigration flows would increase annual salmonid production by decreasing juvenile mortality due to predation, thermal stress, and stranding. (S-[DOI](#)-3; p. 3-Xc-16.)

In 2000, NMFS recommended a study of the timing of smolt emigration and flow needs for the period April 1-June 30. The recommended study would include a variable spring interim flow schedule of 800, 1,500, and 2,000 cfs for a ten-year period. Migration rates at various flows, efficacy and potential water savings of pulsed flows and temporal variation in downstream movement would be investigated. (S-NMFS 1A, pp. 6-7; S-R.T. 126:9-126:25.)

Although a smolt emigration study would provide additional data on flow needs for chinook salmon emigration in the April through June period, the present record is sufficient to justify requiring minimum instream flows in the April through June period that balance the needs of all lifestages of target species in the lower Yuba River. As discussed below, the overall record supports establishing somewhat lower minimum flow requirements than recommended by DFG and USFWS for the April through June period. ~~If the results of further studies support different instream flow requirements, the requirements in this decision could be revised.~~

~~Survival during outmigration is a key factor affecting salmon and steelhead production. USFWS witnesses testified that high, extended spring flows significantly increase the overall success of outmigrating chinook in returning to spawn as adults. (R.T. 2312:7-2312:19.) USFWS also presented evidence that adult spawning escapement²⁴ of fall-run chinook salmon in the Central Valley is positively correlated to streamflow during their spring smolt outmigration period. (S-DOI 9.)~~

~~Peak outmigration of fall, late fall, and spring-run chinook salmon and steelhead occurs in May. The primary benefits of a 2,000-cfs flow in May are to increase survival of emigrating juvenile chinook salmon and steelhead, to attract adult American shad into the lower Yuba River, and to increase the number of adult American shad entering the Feather River system. Although the~~

²³ Following their upstream migration, adult spring-run chinook spend the summer (hold) in deep pools in the Narrows Reach until spawning in late September through early November.

²⁴ ~~Escapement refers to adult anadromous fish that escape harvest and return to spawn.~~

~~record supports adoption of DFG's streamflow recommendation for May, the evidence supports lower minimum flow requirements for most of April and all of June. A primary purpose of DFG's 1,000 cfs flow recommendation during April is to encourage emigration.~~ The DFG flow recommendation of 1000 cfs during April is intended to increase survival of fall-run juvenile chinook salmon. However, the record indicates that emigration of juvenile chinook salmon from the lower Yuba River begins in late April, peaks in May, and is normally complete by the second week in June. (R.T. VIII, 124:3-127:3; R.T. XIV 168:13-169:11; YCWA 20, pp. 3-23; YCWA 80; YCWA 68, Figure 3-4, pp. 3-27.)

Since emigration does not normally begin until the last week of April, flows for juvenile salmon migration need not begin until that time. In addition, survival of emigrating juveniles may decline during June due to increased water temperature downstream of the Yuba River. Therefore, flows to protect juvenile salmon during downstream migration should occur before June.

The minimum flow requirements established in this decision for April through June are expected to provide adequate conditions for upstream migrating adult spring-run chinook salmon. DFG presented testimony that the flow requirements in the 1996 Draft Decision for March through June (which are the same as flow requirements for that period in this decision) are adequate to attract ascending spring-run adults into the lower Yuba River. (S-DFG 1, p. 2.) DFG presented evidence that American shad adults typically begin migrating into the Feather River system and the Yuba River from late April through June. (R.T. I, 183:20-184:14.) Attraction of American shad into the lower Yuba River is related to the proportion of flow in the Yuba River to the flow in the Feather River at the confluence. DFG presented testimony that the Yuba River should contribute at least one third of the combined Yuba/Feather River flows in order to attract adult American shad into the Yuba River. (R.T. I, 75:19-76:13.) Failure to provide sufficient attraction flows would reduce the overall spawning habitat utilized by American shad.

~~Evaluation by DFG of American shad occurrence and distribution, and angler effort and catch information, suggest that streamflows of 1,000 cfs at the Marysville gage in April, 2,000 cfs in~~

~~May, and 1,500 cfs in June would provide suitable attraction, migration, spawning, and recreational fishery flows. (DFG 26, p. 82.) CSPA presented evidence showing that years with flows at Marysville ranging from 2,000 to 7,000 cfs during May (33 to 50 percent of the combined Yuba/Feather River flows) appear to have produced the best American shad fisheries in the lower Yuba River. (CSPA, Exhibit CC.)~~ Creel census data was collected by DFG from 1981 to 1983 and 1985 to 1987 to define the distribution of the American shad spawning population in the Sacramento River Basin in relation to streamflow and other factors. (CSPA, Exhibit CC.) When flows at the mouth of the Yuba River ranged from 200 to 400 cfs in the spring months, the American shad fishery in the lower Yuba River was almost non-existent. At flows ranging from 4,000 to 11,000 cfs, the fishery was excellent. (CSPA, Exhibit CC.) Field investigations of Yuba River American shad conducted by Jones and Stokes Associates in 1990 indicated that a flow of 300 cfs in the first half of May did not attract large numbers of shad into the lower river. Anglers were first observed in the lower river following an increase in discharge to 1,000 cfs in mid-May; with these flows continuing through the end of June, large numbers of shad and high angling success occurred below Daguerre Point Dam beginning the first week of June. (CSPA, Exhibit CC; YCWA 73, pp. 3-2 and 4-1.) We conclude that a minimum flow of 1,500 cfs in May, provided to protect chinook salmon and steelhead, would also provide adequate attraction and spawning flows for American shad in the lower river.

~~However, w~~ When lower Yuba River flows exceeded the 33 percent contribution to joint Yuba/Feather River flows during May, flows as low as 800 cfs during June appeared sufficient to continue attracting adult American shad into the lower Yuba River and to maintain suitable water temperatures for American shad spawning. (CSPA, Exhibit CC.) Therefore, we conclude that a minimum flow requirement of 800 cfs during June is adequate for protection of American shad. In addition, since American shad typically begin migrating into the lower Yuba River in late April, a minimum flow of 1,000 cfs from April 21 through April 30 should be adequate to attract early spawning American shad into the lower river.

YCWA, South Yuba, and PG&E presented testimony in 1992 that the flows recommended by DFG for April through June may be detrimental to fry and juvenile chinook salmon rearing. As support for this contention, YCWA cited data from the Hallwood-Cordua fish screen that showed fewer entrained salmon at higher flow, and DFG beach seining data that showed fewer young salmon were caught during high flow years. (YCWA 20, Figs. 3-1 to 3-4; YCWA 21, p. 18; YCWA 80 and 84.)

The evidence does not establish, however, that increased flows in the spring months are harmful to juvenile chinook salmon or that fewer juvenile salmon are present in the river at higher flows. To the contrary, the USFWS analysis of the Hallwood-Cordua fish screen records indicates that the number of juvenile salmon entrained is related to the percent of total streamflow diverted, and not to the abundance of juvenile salmon in the river. (USFWS 17, pp. 3-15; R.T. VIII, 78:1-78-20; R.T. XIV, 162:8-165:4.) Thus, higher flows would serve to promote survival of juvenile salmon. Similarly, the beach seining data cited by YCWA and South Yuba does not establish the number of juvenile salmon in the river at a particular flow. Rather, as shown in evidence presented by YCWA and USFWS, beach seining is less likely to catch representative numbers or sizes of juvenile salmon during high flow years. (YCWA 80, p. 2; USFWS 18, p. 2; R.T. VIII, 131:7-135:85; 144:3-149:9.)

Testimony presented by YCWA and South Yuba suggests that increased flows in the spring months, April through June, may decrease water temperatures and result in slower growth of juvenile chinook salmon and delayed emigration from the lower Yuba River. Witnesses for YCWA and South Yuba ~~hypothesized~~ testified that delayed emigration would result in lower survival of fish as they migrated through the lower Sacramento River and Delta where elevated temperatures may occur in the late spring. (S-SOUTH YUBA 2, pp. 21-24; S-YCWA 19, pp. [3-16]–[3-17]; S-YCWA 42; S-R.T. 798:15-799:5; S-R.T. 991:15-992:10; S-R.T. 2611:23-2613:22; S-R.T. 2860:5 – 2863:22; S-R.T. 2869:12-2875:24.) As supporting evidence, YCWA and South Yuba presented data that indicate that the timing of juvenile chinook emigration was later in

years with higher spring flows in the lower Yuba River. (S-YCWA 19, pp. [3-16]-[3-18]; S-YCWA 42; S-R.T. 590:23-591:16.)

Substantial evidence in the record indicates, however, that the spring flows adopted in this decision will not result in delayed emigration or lower survival of emigrating juvenile chinook. The relationship between timing of juvenile chinook salmon emigration and spring flows in the lower Yuba River presented by YCWA may not be valid due to the sampling method used for juvenile chinook. Sampling data were obtained from the Hallwood-Cordua fish screen trap. Testimony presented by DFG, YCWA, and South Yuba indicates that this trap was not operated over consistent time periods each year. (S-R.T. 1011:9-1016:17; S-R.T. 1236:20-1237:16; S-R.T. 2235:9-2238:3.) Therefore, use of the data for comparison of emigration timing between years may not be valid.

Evidence in the record also indicates that water temperatures in the lower Yuba River change very little in response to changes in streamflow. Relationships developed by YCWA to predict water temperature changes in the lower Yuba River show that a 1,000 cfs change in flow at Marysville during April or May would result in less than a one degree Fahrenheit change in water temperature at Marysville. (S-YCWA-18, p. 18.) The spring flows in this decision would therefore have an insignificant effect on spring water temperatures compared to recent historical conditions, and would not be expected to significantly reduce growth rates or delay emigration of juvenile salmonids.

In addition, ~~South Yuba and DFG presented testimony~~ the record indicates that there are no studies that support the theory that survival of juvenile chinook salmon from the lower Yuba River is lower in years with high spring flows. (S-South Yuba 2, p. 24; S-R.T. 2238:7-2238:21.) To the contrary, evidence presented by YCWA and USFWS shows that growth and production of juvenile chinook salmon in the lower Yuba River have been good during high flow years. (YCWA 80; USFWS 18: and R.T. XIV, 175:19-176:2.) As discussed earlier, USFWS presented testimony that high, extended spring flows significantly increase the overall success of outmigrating chinook in

returning to spawn as adults. (R.T. 2312:7-2312:19.) Adult spawning escapements of fall-run chinook salmon in the Central Valley are positively correlated to increased flow during their spring smolt outmigration period. (S-DOI 9.)

South Yuba also argued that outmigration of chinook salmon smolts is stimulated by changes in flow and that maintaining stable flows throughout the spring outmigration period may result in delayed migration. (S-South Yuba 2, pp. 14-18.) However, USFWS witnesses testified that a sustained flow throughout the chinook salmon and steelhead spring outmigration period would likely result in better survival than a shorter duration pulse flow. USFWS presented testimony that providing sustained flows that allow fish to outmigrate when they are physiologically ready to migrate is more effective than providing shorter duration pulse flows that may or may not match the timing of physiological readiness. (S-R.T. 358:9-359:21.)

July through September 14: The primary fishery activities during this period are:

- Steelhead juvenile and yearling rearing (July through September)
- Steelhead adult upstream migration (August and September),
- Late fall-run chinook salmon juvenile rearing (July through September),
- Spring-run chinook salmon upstream migration and holding (July through September),

Based on historical unimpaired flows, DFG recommended a minimum flow of 450 cfs at the Marysville gage from July through September for the protection of steelhead rearing in the Daguerre Point Dam reach. (DFG 26, p. 109.) Flows upstream of Daguerre Point Dam would be higher due to water releases from Englebright Reservoir for irrigation. (R.T. I, 116:12-116:16; 131:6-131:9; DFG 26, p. 110.)

A flow of 450 cfs, as recommended by DFG, exceeds the 250 cfs that would provide maximum weighted useable area for juvenile steelhead, but DFG contends that the higher flows will be needed to maintain water temperature within a range suitable for rearing steelhead. (DFG 26, p. 109.) Observations by a field biologist, however, indicate that streamflows in the range of

250 cfs have been suitable for maintaining juvenile steelhead habitat in the Daguerre Point Dam reach from July through September. (YCWA 76, p. 8; YCWA 20, pp. E-12 and E-13; PG&E 2, pp. 4 and 5; R.T. VIII, 77:2-77:15.) Based on their similar life histories, it is reasonable to assume that the habitat needs of late fall-run chinook salmon will also be met at a flow of 250 cfs.

A flow of 250 cfs should also be sufficient to provide adequate passage for steelhead and spring-run chinook salmon that migrate upstream during this period. IFIM/PHABSIM model results indicate that a minimum flow of 175 cfs is needed for adequate passage of adult chinook salmon over shallow riffles in the lower Yuba River. (DFG 26, pp. 93 to 95; R.T. I, 103:17-104:12; R.T. I, 187:20-189:19 and 196:1-196:6.) Based on the evidence discussed above, we conclude that the minimum flow requirement for July through September 14 should be 250 cfs, measured at the Marysville Gage. The subject of suitable water temperatures is addressed in Section 6.6 below.

6.5.7.2 Instream Flows in Dry and Critical Water Years

Extensive evidence was presented on the impact of instream flows required in the 1996 Draft Decision on water available for consumptive use, particularly in dry and critical water year types. (S-YCWA 16.) As in all Central Valley rivers, flows in the lower Yuba River are highly variable on an annual basis. Based on the evidence of flows needed for fishery protection and competing demands for water for offstream uses, we believe it is reasonable during certain time periods to reduce the minimum flow requirements in dry and critical water years.

In the DFG instream flow recommendations, a dry year was defined as less than 50 percent of the 50 year average impaired runoff in acre-feet at Smartville as published annually in the Department of Water Resources May 1 Report of Water Conditions in California. (DFG 26, pp. 112-113.) In 2000, YCWA presented a revised water year classification system for the lower Yuba River, the Yuba River Index. (S-YCWA 14.) We concur with the use of the more detailed classification system presented by YCWA and have separated flow requirements in this decision into the five water year types defined by the index. ([Appendix 1.](#)) In addition, this decision establishes an extreme critical year classification based on criteria used in the Yuba River Index.

The Yuba River Index is based on the estimated unimpaired flow at Smartville for each water year, as published in California Department of Water Resources Bulletin 120. Flow requirements for each water year under this decision are based on the April 1 forecast of the unimpaired flow at Smartville for the water year, which includes hydrologic conditions to date plus forecasts of runoff for the remainder of the year, assuming normal precipitation for the remainder of the year. Requirements established on April 1 would remain in effect ~~until April 1~~ through March 31 of the following year.

Providing adequate spawning, egg incubation, and early rearing habitat for spring-run chinook salmon from September 15 through October 14 in the Garcia Gravel Pit Reach is essential for the protection and recovery of the run. As discussed in section 6.5.7, a flow that supports optimum habitat for spring-run spawning (700 cfs) should be provided in below normal, above normal, and wet water years. However, under unimpaired conditions, flows at Smartville in September and October of dry and critical years frequently were less than 700 cfs. (DFG 26, pp. 18-21.) YCWA proposed flows of 500 and 400 cfs, respectively, in dry and critical water years from September 15 through October 14 at the Smartville gage. (S-YCWA-19, p. 4-1.) In view of the lower flows under unimpaired conditions, we believe that the flows proposed by YCWA for September 15 to October 14 will provide reasonable protection for spring-run spawning and early rearing, while preserving a substantial quantity of water for other purposes.

Minimum flows of 700 cfs at the Smartville gage and 500 cfs at the Marysville gage for the October 15 through April 20 period were established to provide optimum habitat for fall and spring run Chinook salmon and steelhead spawning, egg incubation and rearing. To conserve water in dry and critical years, we believe it is reasonable to reduce this flow requirement to 600 cfs and 400 cfs, at the Smartville and Marysville gages, respectively. The IFIM studies show that these minimum flows should provide at least 98 percent of optimum habitat for Chinook salmon spawning and rearing, and at least 94 percent of optimum habitat for steelhead spawning and rearing.

Testimony provided by YCWA suggests that flows in the range of 1,100 cfs during the last two weeks of May in 1990 were sufficient to improve the American shad fishery compared to the previous dry years. (YCWA 73, pp. 3-2 and 4-1.) A flow of 1,100 cfs at Marysville during May, however, may result in lower survival of emigrating juvenile chinook salmon and steelhead than would occur at ~~the 2,000 cfs flow proposed by DFG~~ 1,500 cfs. To minimize impacts on chinook salmon and steelhead but conserve water for other purposes, we believe it is reasonable to reduce the flow requirement in May to ~~1,500 cfs in dry water years, and to~~ 1,100 cfs in critical water years, as measured at the Marysville gage.

The 1996 SWRCB Draft Decision included a lower flow requirement of 1,100 cfs in May in dry water years, defined as less than 50 percent of the 50 year average impaired runoff in acre-feet at Smartville. Even with this lower flow requirement, however, operations modeling conducted by the SWRCB showed that instream flow requirements in the 1996 Draft Decision would have severe impacts on water deliveries at Daguerre Point Dam in ~~extremely~~ some critical water years. (S-SWRCB 1; S-SWRCB 3, Table A-22.) Over the 71 year period of record, 50 percent deficiencies in deliveries were modeled in water years 1924, 1931, 1934, 1976, and 1977 at the present level of demands. Deficiencies of this magnitude (over 155,000 acre feet) are too great to be made up with conjunctive use of groundwater in a single season without adverse effects on the groundwater basin.

Analysis of those years where severe deficiencies occurred shows that the Yuba River Index, calculated using unimpaired flow data (DFG-26, p. 19) and YCWA methodology (S-YCWA 14), was less than 540,000 ~~thousand~~ acre-feet (540 TAF). To reduce impacts to water deliveries in the spring months of those extremely critical years, we believe it is reasonable to reduce the required instream flows from April 21 through June 30 to 500 cfs, measured at the Marysville gage. The 500 cfs flow requirement will apply only in those years when the Yuba River Index is predicted to be less than ~~540,000 thousand acre feet~~ 540 TAF.

A minimum flow of 500 cfs in the spring months of extreme critical years may result in lower survival of emigrating juvenile chinook salmon and steelhead, and reduced spawning and rearing success of American shad, than with the higher minimum spring flows in other water year types. However, extreme critical water years occur rarely, in fewer than 10 percent of water years. Minimum flows of 500 cfs will provide higher minimum flows than are now required and promote a reasonable balance between fishery protection and consumptive water uses in extreme critical water years.

6.5.8 *Flow Fluctuations and Reductions*

Fluctuations and reductions in streamflow can cause dewatering of salmonid redds and stranding of fry and juvenile fish. (DFG 26, pp. xiii and 113; R.T. I, 132:3-132:9.) For purposes of this decision, daily streamflow fluctuations are considered to be changes in flow that occur on a regular daily basis which are generally associated with daily operations of hydroelectric power generation or deliveries to water diverters. Streamflow reductions are considered to be planned reductions in flow for more than a day such as those associated with changes in instream flow requirements, reservoir flood reservation requirements, deliveries to offstream diverters, water transfers and downstream salinity intrusion control. Changes in flow that occur due to storm events are not considered to be fluctuations or reductions subject to regulation as a condition of a water right permit or license.

Provisions of 1965 Agreement: The 1965 agreement provides that daily streamflow fluctuations during the period of October 16 through March 31 shall not cause releases to vary by more than 15 percent from the scheduled uniform releases and that flow variance shall be minimized where possible. During January 16 through October 15, project flow releases from Englebright Reservoir for start-up, shutdown, and operation of the Narrows Power Plant may not fluctuate more than 500 cfs per hour and hourly releases are to be as gradual as possible. Flow reductions between October 15 and October 31 must be no more than 35 percent of the flow during the preceding seven day period, and the reduction in average flow from November 1 to November 30 must be no

more than 15 percent of the average flow during the preceding seven day period. Fluctuations in streamflow are to be measured at the USGS gaging station below Englebright Dam.

Although various lifestages of salmon, steelhead and American shad are present in the lower Yuba River throughout the year, the 1965 agreement regulates changes in flow only during certain months. For the Yuba River downstream of Englebright Reservoir, the agreement contains no requirements governing flow reductions between December 1 and January 15 when salmon and steelhead eggs are incubating and fry are present. The agreement also does not include flow fluctuation limitations from April 1 through October 15 when salmon and steelhead rearing occurs and American shad spawning occurs.

Analysis of the Evidence on Criteria for Flow Fluctuation and Reduction: DFG's Fisheries Management Plan includes revised recommendations for regulation of daily flow fluctuations and flow reductions. (DFG 26, pp. xiii-xv.) The evidence presented does not demonstrate that the existing 15 percent daily streamflow fluctuation limitation is inadequate, except for the fact that it presently is not in effect throughout the year. Extending the present 15 percent daily streamflow fluctuation limitation to scheduled releases throughout the year would provide additional protection against stranding fish and dewatering eggs.

In 1992, DFG proposed weekly flow fluctuation limitations of plus or minus 200 cfs during May and plus or minus 150 cfs during June to promote American shad spawning and angler success. (DFG 26, p. 114; R.T. I, 77:1-77:17; R.T. II, 33:4-37:8.) Studies on the Feather River indicate that flow fluctuations resulting in water temperature changes of plus or minus three degrees Fahrenheit can affect American shad spawning activity. (DFG 26, p. 80; R.T. I, 77:6-77:17; R.T. II, 33:4-37:8.) The magnitude of flow change that will result in a three degrees Fahrenheit change in water temperature, however, is not known with certainty. Therefore, there is insufficient evidence to adopt the 150 cfs and 200 cfs limitation on weekly streamflow fluctuations proposed by DFG.

DFG also recommended that daily streamflow reductions should not exceed more than 30 percent of existing flows. For example, streamflow reductions between May and June during a normal or wet water year would be accomplished by reducing the minimum flow on a gradual basis by no more than 30 percent every 24 hours. Thus, the 2,000 cfs minimum flow in May could be gradually reduced ("ramped" down) by as much as 600 cfs during the first day of flow reductions. Applying the same streamflow reduction criteria on a year-round basis is reasonable due to the presence of various life stages of anadromous fish susceptible to flow fluctuations throughout the year.

To further reduce impacts to spawning salmon and steelhead, DFG proposed additional criteria in 1992 for October through March to prevent redd dewatering and stranding of fall-run chinook salmon and steelhead fry. In 2000, DFG recommended that flows occurring on September 1 should be maintained thereafter to prevent dewatering of redds, and loss of incubating eggs and emerging spring-run chinook salmon. (S-DFG 1, p. 4; S-R.T. 1957:5-1957:11.) DFG recommends that flow reductions of no more than 300 cfs should occur after September 1. (S-DFG 1, p. 4.)

YCWA conducted an analysis which utilized transect data from DFG's IFIM/PHABSIM study to determine the effect of flow reductions on redd dewatering and fry stranding. The analysis indicates that about one percent of the redds present above and below Daguerre Point Dam at a particular time are likely to be stranded when flows drop from 1,000 cfs to 700 cfs. About three and one half percent would be stranded when flows drop from 1,200 cfs to 700 cfs, and about ten percent would be stranded by a flow reduction from 1,500 to 700 cfs. (YCWA 20, pp. C-1 to C-6.)

Field evaluation data on the effects of a flow reduction of 2,000 cfs to about 850 cfs during October 1990 as measured in the Yuba River at Marysville show that the YCWA analysis would provide a reasonable basis on which to establish flow reduction requirements. (Testimony

presented during the January 1, 1992, SWRCB hearing on streamflows and temporary flow requirements in the lower Yuba River, R.T. from January 1, 1992, 138:8-139:5.)

Spring-run chinook salmon spawning begins in mid-September, while most fall-run chinook salmon and steelhead spawning and egg incubation occurs in October and subsequent months. The information in the YCWA dewatering analysis indicates that establishing a limit of 45 percent on flow reductions from September 15 through the end of October would result in protecting at least 90 percent of the redds present in September and October against dewatering. Establishing a limit of 35 percent on flow reductions from November through March, when fall-run chinook salmon and steelhead spawning are at a peak, would result in protecting at least 95 percent of the redds present during that period.

In addition to the flow reduction criteria identified above, establishing a flow reduction limitation of 30 percent during any 24-hour period would reduce stranding of fry. Due to the importance of minimizing dewatering of redds and fish stranding, YCWA should be required to consult with DFG and USFWS and to conduct field monitoring to verify that the specified flow reduction criteria provide adequate protection against dewatering and stranding.

In 2000, DFG recommended that no flow reductions of more than 300 cfs should occur after September 1, for the protection of spring-run eggs and fry. DFG based that recommendation on verbal information from YCWA, that a 100 cfs flow change results in approximately a 2-inch water surface elevation change. Spring-run spawning occurs at depths of 0.5 feet to over 3 feet, with an average depth of 1.85 feet. Due to the observed shallow depth (6 inches) of spring-run redds, DFG concluded that flow changes of greater than 300 cfs would impact spring-run redds, incubating eggs and emerging fry. (S-DFG 1, p. 3.)

We find that the verbal information that DFG received from YCWA on the relationship of flow changes to changes in water surface elevation is not sufficient to justify further limitations on flow fluctuations. Changes in water surface elevation depend on many factors, including the initial flow

rate and channel morphology at a particular location. The relationship between flow and water surface elevation referred to by DFG is not supported by YCWA's previous analysis of the IFIM data. YCWA's previous, more detailed analysis appears to provide more accurate information on the incremental change in water surface elevation with changes in flow. Therefore, we conclude that limiting flow reductions to 300 cfs after September 1 would be overly protective. Other limitations on flow reductions established in this decision should provide adequate protection for spring-run spawning and egg incubation. Similarly, we find that the NMFS recommendation that any reductions or fluctuations in flow during the spawning and egg incubation period of the listed salmonids should be prohibited is overly protective and would not be feasible in the course of real-time project operations.

The flow fluctuation criteria proposed by YCWA were intended to apply only to YCWA-controlled releases for project purposes. (S-YCWA 19, p. 4-2.) YCWA did not intend these criteria to apply to releases made for flood control purposes, releases of uncontrolled inflows into Englebright Reservoir, uncontrolled spills, or releases made for out-of-county water transfers that would be subject to independent environmental review. We concur that the criteria cannot apply when flood control releases are made, [uncontrolled inflows into Englebright Reservoir are bypassed](#), or uncontrolled spills occur. However, since the purpose of the fluctuation criteria is the protection of anadromous salmonid resources in the lower Yuba River, the flow fluctuation criteria should apply to releases for all other purposes whenever releases are under the control of the project operator.

[During the 2000 hearing, YCWA presented testimony that minimum instream flow requirements should be measured on 5-day running averages, with the instantaneous flow never to be less than 90 percent of the applicable requirement. Measuring minimum flow requirements in that manner would allow YCWA to avoid having to release substantial amounts of additional water to ensure that it is meeting the minimum flows. \(S-YCWA 11, p. 5.\) No party presented any evidence that this proposal would adversely affect fish and the SWRCB concludes that, in this instance, it is a reasonable method of measuring compliance with the minimum instream flow requirements.](#)

6.5.9 Summary of Flow Requirements for Fishery Protection

The relationship between competing demands for water from the lower Yuba River and the requirements established for protection of lower Yuba River fishery resources is addressed in Section 8 through 8.4 of this decision. [Appendix 5 of this decision contains graphs showing the instream flow recommendations of the DFG Fisheries Management Plan, YCWA’s instream flow recommendations at the 2000 hearing, and the minimum instream flow requirements established in this decision for each water-year type.](#) Based on the findings above, the SWRCB's conclusions regarding flow requirements for fishery protection purposes in the lower Yuba River can be summarized as follows:

1. The minimum average daily streamflows needed for protection of fish in the lower Yuba River are specified in Table 9 below. [The minimum requirements should be maintained based on a 5-day running average of daily streamflows with instantaneous flows never less than 90 percent of the applicable requirement.](#) From September 15 to April 20, flows should be measured at the Smartville and Marysville gages. During the remainder of the year, minimum flows should be measured at the Marysville gage. Although gaging requirements during some periods will be only at Marysville, the SWRCB's intent is that the flows specified below also be maintained immediately downstream of Daguerre Point Dam.

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TABLE 9
MINIMUM AVERAGE DAILY STREAMFLOW
REQUIREMENTS IN THE LOWER YUBA RIVER

Periods	Wet, Above Normal & Below Normal Years (cfs)		Dry Years (cfs)		Critical Years (cfs)		Extreme Critical Years (cfs)	
	Smartville Gage	Marysville Gage	Smartville Gage	Marysville Gage	Smartville Gage	Marysville Gage	Smartville Gage	Marysville Gage
Sept. 15 - Oct 14	700	250	500	250	400	250	400	250
Oct 15 - Apr 20	700	500	700 600	500 400	700 600	500 400	700 600	500 400
Apr 21 - Apr 30	--	1,000	--	1,000	--	1,000	--	500
May 1 - May 31	--	2,000 1,500	--	1,500	--	1,100	--	500
Jun 1	--	1,400 1,050	--	1,100 1,050	--	800	--	500
Jun 2	--	980 800	--	900 800	--	800	--	500
Jun 3 - Jun 30	--	800	--	800	--	800	--	500
Jul 1	--	560	--	560	--	560	--	500
Jul 2	--	390	--	390	--	390	--	390
Jul 3 - Sept. 14	--	250	--	250	--	250	--	250

* "Extreme Critical" year classification is defined as: Equal to or less than 540 TAF on the Yuba River Index scale.

2. For purposes of this decision, wet, above normal, below normal, dry and critical water year types are as defined in the Yuba River Index. (S-YCWA 14.) Extreme critical water years are defined as years when the Yuba River Index is predicted to be less than 540 TAF. Determination of water year classification shall be made on April 1 of each year, in accordance with the forecast of unimpaired flow of the Yuba River at Smartville published in California Department of Water Resources Bulletin 120. The year type for the preceding water year will remain in effect until April 1 when the current year forecast is available.

3. Flow fluctuation criteria identified in paragraphs 3 through 6 herein should apply whenever releases are under the control of the project operator. [These criteria shall not apply to releases made for flood control purposes, bypasses of uncontrolled inflows into Englebright Reservoir, or uncontrolled spills.](#) YCWA's permits should be amended to provide that daily streamflow releases below Englebright Dam shall not vary by more than 15 percent of the scheduled release except during periods when flows are beyond control of the project operator. Project releases or bypasses that increase streamflow downstream of Englebright Dam should not exceed a rate of change of more than 500 cfs per hour.

4. To prevent stranding of fry, project releases or bypasses that reduce streamflow downstream of Englebright Dam shall be gradual and, during any 24-hour period, should not be reduced below ~~70%~~ [percent](#) of the prior day's flow release or bypass flow.
5. To prevent dewatering of salmon redds during the period from September 15 to October 31, YCWA's permits should be amended to provide that flows may not be reduced below 55 percent of the maximum release that has occurred during the period of September 15 to October 31, or the minimum streamflow requirement that would otherwise apply, whichever is greater.
6. To prevent dewatering of salmon redds between November 1 to March 31, YCWA's permits should be amended to provide that releases from Englebright Reservoir may not be reduced below the minimum release or bypass established under paragraph 5 above, or 65 percent of the maximum flow release that has occurred during the period from November 1 to March 31, or the minimum streamflow requirement that would otherwise apply, whichever is greater.
7. To ensure that salmon and steelhead redds and fry are adequately protected from dewatering or stranding, YCWA should be required to conduct further field monitoring of the effects of flow fluctuations in conjunction with DFG and USFWS for a period of time agreed to by DFG and USFWS. [If YCWA, DFG, and USFWS cannot reach an agreement regarding the appropriate period of time for this monitoring, then YCWA may request the Chief of the Division of Water Rights to determine an appropriate time period.](#) Summary reports of said monitoring covering the year ending the previous September 30 should be submitted annually to the SWRCB by December 31, and a final report should be submitted within one year of completion of the study.
8. Daily streamflow fluctuations and/or streamflow reductions are to be monitored at the Smartville gage. YCWA's permits should be amended to provide for construction of any

gages necessary to measure and verify compliance with the minimum flow and flow fluctuation requirements of this decision.

9. In accordance with the criteria discussed in Section 8.4 below, the instream flow requirements established in this decision are subject to temporary modification based on projected deficiencies in the amount of surface water available for offstream uses.

6.6 Water Temperature Requirements for the Protection of Fishery Resources

Maintaining suitable water temperatures for anadromous fish is an essential element of providing habitat to maintain fish in good condition. Improvement of water temperature conditions in the lower Yuba River for salmon, steelhead, and American shad was one of the intended purposes of the New Bullards Bar Reservoir project. (R.T. IV, 251:7-253:23; R.T. V, 40:7-40:13.) In 1966, YCWA received a grant from the Department of Water Resources under the Davis-Grunsky Act to construct an adjustable subsurface intake structure at New Bullards Bar Reservoir to allow for releasing water from different depths in order to provide "to the maximum extent feasible" water between 46 degrees Fahrenheit and 56 degrees Fahrenheit in the lower Yuba River during October 1 through March 31. (CSPA AA, pp. 39-42.) The reservoir outlet control gates at the dam provide the ability to release water from different levels, from near the surface at elevation 1,956 feet to a low-level outlet at elevation 1,638 feet. (S-YCWA 18, p. 7.)

Section 3.3 of YCWA's 1965 agreement with DFG provides that YCWA is to operate the facilities at New Bullards Bar Dam "so as to provide water temperatures comparable to or better than present values with regard to fishery resources." (DFG 26, p. 190.) Since completion of New Bullards Bar Reservoir in 1969, water temperatures downstream of Daguerre Point Dam near Marysville have generally been: (a) warmer from around mid-March to mid-June, (b) cooler from around mid-June to mid-December, and (c) about the same from mid-December to mid-March,

compared to pre-New Bullards Bar conditions. (DFG 26, pp. 46 and 47; R.T. I, 92:15-92:24; S-YCWA 19, p. 3-9.)²⁵

In 2000, YCWA presented testimony that, under ~~current~~the operational procedures that it began in 1993, the low-level outlet at New Bullards Bar Dam is used for water releases throughout the year. (S-YCWA 11, pp. 2-3; S-YCWA 18, p. 7; S-R.T. 1349:12-1349:13.) ~~The~~A Temperature Advisory Committee, convened by YCWA with representatives from the DFG and the USFWS, established these criteria in 1993 after review of relevant data including ~~a number of studies described in the 1992 hearing~~ reservoir temperature profiles and temperature modeling data. (S-YCWA 18, p. 7; S-R.T. 1349:14-1349:23.)

In 1999, YCWA submitted a proposal for Proposition 204 funding for the Narrows II Powerhouse Intake Extension Project. (S-SWRCB 12; S-R.T. 1520:4-1520:23.) The project would extend the intake of the powerhouse to allow the cooler water that is present at lower levels of Englebright Reservoir to flow through the Narrows II Powerhouse and into the lower Yuba River. Construction of the project would allow water temperatures at the powerhouse release to be lowered by an estimated 2 to 6 degrees Fahrenheit from May through October. (S-SWRCB 12.)

6.6.1 Water Temperature Requirements for Anadromous Fish

DFG presented testimony that water temperature is the primary factor influencing growth and survival of chinook salmon, steelhead and American shad in the lower Yuba River. (R.T. I, 88:10-90:2.) YCWA and South Yuba also presented testimony on the effects of water temperature on growth and survival of salmonids. (YCWA 20, 68 and 80; South Yuba 20 and 21.)

Water temperatures preferred by chinook salmon, steelhead and American shad in the lower Yuba River vary with the time of year, life stage and species. (DFG 26, pp. 41-43 and 47-63; R.T. I,

²⁵ YCWA introduced evidence that between completion of New Bullards Bar Reservoir in 1969 and 1993, DFG directed YCWA to release water as warm as possible from New Bullards Bar Reservoir starting in April of each year and to release as cool water as possible starting in September of each year. (S-YCWA 11, p. 2.)

93:16-94:8.) When water temperature is above the preferred range, mortality rates increase, growth rate is reduced, and susceptibility to disease is increased. (DFG 26, p. 41; South Yuba 21, p. 15; R.T. XI, 7:15-8:25.) When temperature drops below the preferred range, growth rate is reduced and survival can also decrease. (DFG 26, p. 41.) California is at the southern end of the species range for salmon and steelhead, and the streams have a tendency to be warmer than streams in the northern end of the range. Consequently, water temperatures preferred or tolerated by salmon and steelhead in the lower Yuba River may be at the upper end of the preferred temperature range. (R.T. II, 9:7-10:2; R.T. X, 211:18-212:3.)

In 1992, DFG presented evidence regarding water temperature ranges preferred by the various life stages of fall-run and spring-run chinook salmon, steelhead, and American shad. The evidence on preferred water temperatures, shown in Table 10, was developed by DFG based on their review of several water temperature studies.

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TABLE 10
PREFERRED TEMPERATURE RANGES FOR
ANADROMOUS FISH (°F)

LIFE STAGE	CHINOOK SALMON		STEELHEAD	AMERICAN SHAD
	FALL-RUN	SPRING-RUN		
Spawning Migration	44.1-57.5	37.9-55.9	46.0-52.0	48.9-66.2
Spawning	41.0-57.0	40.0-57.0	39.0-52.0	59.0-70.0
Egg Incubation and Emergence	41.0-57.9	41.0-57.9	48.0-52.0	57.9-66.0
Fry Rearing	44.6-57.2		55.0-60.1	59.9-69.8
Juvenile Rearing	45.1-58.3		45.1-60.1	59.9-69.8
Adult Holding		≤ 77.0		

No water temperature data were available for spring-run chinook salmon fry and juvenile rearing, but the species are so similar that it is reasonable to assume the temperature preferences are similar to that of fall-run chinook salmon. (DFG 26, p. 44.) Preferred water temperatures of adult spring-run chinook salmon holding in freshwater during the summer months can range from less than 60 degrees Fahrenheit to as high as 77 degrees Fahrenheit. (DFG 26, pp. 9 and 42.) Testimony presented by YCWA in 1992 generally concurred with DFG that the optimum water temperature for spawning salmon ranges from 46 to 56 degrees Fahrenheit. (R.T. IX, 162:5-162:6.)

In 2000, YCWA summarized optimum temperature ranges reported in the fisheries literature for various life stages of chinook salmon, steelhead and American shad. (S-YCWA 19, pp. [3-24]-[3-25].) These temperature ranges were similar to those reported by DFG in 1992. However, YCWA also reported the results of a recent study by Drs. Cech and Myrick of temperature effects on juvenile steelhead and chinook salmon acquired from the Nimbus Fish Hatchery. (S-YCWA 19, pp. [3-25]-[3-26].) YCWA consultants testified that juvenile steelhead and chinook

salmon in the study exhibited higher preferred temperature ranges than reported by other researchers. The YCWA consultants also testified that Nimbus steelhead used in the study preferred temperatures between 17°C and 20°C (62.6° - 68°F), irrespective of food ration level or rearing temperature, and Nimbus chinook salmon reached maximum growth at 19°C (66.2°F). (S-YCWA 19, pp. [3-25]-[3-26].)

DFG biologists dispute that the Cech and Myrick report concludes that 66.2°F was “optimal” for juvenile chinook salmon or juvenile steelhead. (S-DFG 36, p. 25; S-DFG 38, p. 5; S-RT 2443:13-2452:22.) DFG testified that “optimal” temperatures for salmonids occur at preferred temperatures and maximum food conversion efficiencies. (S-DFG 38, p. 2.) The DFG witnesses emphasized that the report states: (1) there were no significant differences between mean or final preferred temperatures of any treatment; (2) there were no significant temperature effects on full ration salmon gross conversion efficiencies; and (3) it is premature to conclude that the optimum temperature for Central Valley steelhead is 19 degrees Centigrade (66.2 degrees Fahrenheit). Thus, DFG concluded that the study did not show higher preferred temperature ranges than reported by other researchers. (S-DFG 38, p. 6; S-RT 2450:1-2451:5.)

6.6.2 ~~USGS Streamflow and Water Temperature Records~~

In 1992, water temperature data were presented for the 1973 through 1978 period from the U.S. Geological Service (USGS) gages at Smartville (below Englebright Dam) and near Marysville. (DFG 26, pp. 47 and 48.) ~~Review of the USGS streamflow and temperature records for 1973 through 1978 indicates that the minimum streamflows required by the 1965 Agreement failed to maintain maximum daily water temperature within the range preferred by fall-run chinook salmon. When water temperatures within the preferred range existed at Smartville, flows greater than those required under the 1965 Agreement were always present. During May, streamflows at Marysville in excess of 3,000 cfs did not always maintain maximum daily water temperatures within the preferred range.~~ In 2000, YCWA presented temperature data for the lower Yuba River at the Marysville gage during three periods for which temperature data were available: 1965-1968, 1974-1977, and 1989-1999. YCWA testified that the Yuba River Development Project has been

operated differently since the 1976-1977 drought and, thus, temperatures for the 1989-1999 period are more representative of current operations. (S-YCWA 18, pp. 2-3.)

6.6.3 Water Temperature Recommendations

In 1992, DFG presented water temperature recommendations for fisheries protection in the lower Yuba River. The DFG recommendations were supported by the USFWS, CSPA, and Walter Cook. (R.T. III, 173:19-174:11; R.T. XIV, 179:1-179:13; R.T. XIII, 80:3-81:4 and R.T. XII, 76:2-76:9.) The mean daily water temperatures for normal and wet years recommended by DFG in 1992 are shown below in Table 11:

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TABLE 11

DFG'S RECOMMENDED MEAN DAILY WATER TEMPERATURE REQUIREMENTS FOR NORMAL AND WET WATER YEARS (°F) (1992)

TIME PERIOD	DAGUERRE POINT DAM	MARYSVILLE
October 1 - March 31	56	57
April 1 – April 30	60	60
May 1 – May 31	--	60
June 1 – June 30	--	65
July 1 – August 31	65	--
Sept 1 – Sept 30	--	65

DFG's 1992 water temperature recommendations were at or above the upper limit of preferred water temperature ranges for salmon and steelhead. DFG explained that the recommended water temperatures for chinook salmon and steelhead represent a compromise between the desired temperatures and the feasibility of providing those temperatures. (R.T. II, 197:11-199:1.) The 60 degrees Fahrenheit recommendation at Marysville during April and May for rearing chinook salmon was made with the recognition that water temperatures upstream of Marysville would be cooler and that American shad would benefit during May. (R.T. III, 8:2-8:15; R.T. III, 7:24-8:6.) In 2000, DFG and NMFS presented revised water temperature recommendations based on the need for protection of all lifestages of spring and fall-run chinook salmon and steelhead in the lower Yuba River, particularly the listed species. DFG presented testimony that the proposed temperature requirements in the 1996 Draft Decision did not adequately address the specific needs of spring-run chinook salmon or steelhead and that the listing of these species makes it imperative to maintain the water temperatures necessary to protect them. DFG and NMFS recommend establishing the maximum water temperatures shown in Table 12. (S-DFG 1, p. 4; S-NMFS 1A, pp. 7-8; S-R.T. 127:1-127:5; S-R.T. 1956:14-1957:4; S-R.T. 1966:24-1968:4; S-R.T. 1970:20-1971:6.)

TABLE 12
DFG and NMFS REVISED RECOMMENDED
WATER TEMPERATURE REQUIREMENTS (°F) (2000)

TIME PERIOD	DAGUERRE POINT DAM	MARYSVILLE GAGE	TARGET SPECIES
Oct. 1 – June 30	56	56	Spring-run, fall-run chinook, steelhead
July 1 – Sept. 30	56	60	Spring-run, fall-run chinook, steelhead

The above recommendations are based primarily on the following lifestage needs. Spring-run chinook adults over-summer in the lower Yuba River from June through September or October and spawn from early September through mid-October. The temperature of 56 degrees Fahrenheit at Daguerre Point Dam would provide protection for these lifestages, based on recent research by USFWS on temperature effects on Sacramento River fall and winter-run chinook. (S-DFG 1, p. 3; S-DFG 10; S-R.T. 1950:19-1951:14; S-R.T. 1956:14-1956:20; S-R.T. 1965:3-1965:23.) Substantial numbers of juvenile steelhead move downstream below Daguerre Point Dam throughout the summer. DFG presented testimony that it is important to provide a water temperature of 60 degrees Fahrenheit below Daguerre Point Dam during the summer for juvenile steelhead rearing. (S-DFG 1, p. 3; S-R.T. 1951:15-1952:2; S-R.T. 1956:25-1957:4.)

6.6.4 Feasibility of Achieving Recommended Water Temperatures

YCWA presented testimony that maintaining the water temperatures in the 1996 Draft Decision, and those recommended by DFG and NMFS in 2000, would not be feasible through operation of the existing project facilities. The channel of the lower Yuba River is relatively wide and flat, with little or no bank shading. The high surface area to flow volume ratio results in rapid increases in water temperature below Englebright Dam. (S-YCWA 18, pp. 3-6.) Under current operational procedures, the low-level outlet at New Bullards Bar Dam is used for water releases throughout the year. (S-YCWA 18, p. 7; S-R.T. 1349:12-1349:13.) Therefore, the only method of lowering water temperatures at Marysville is to increase releases from New Bullards Bar Reservoir.

YCWA's consultants testified that significant amounts of water in addition to the amounts required to meet the instream flow requirements would need to be released to implement the temperature requirements in the Draft Decision. (S-YCWA 18, pp. 24-25.) Even if releases were capped at the 3,500 cfs release capacity of Yuba's Narrows 2 Powerhouse, evidence presented by YCWA indicates that approximately 164,000 acre-feet per year of additional water would be required to attempt to meet the water temperature requirements. (S-YCWA 18, p. 28.) Using large quantities of water would significantly deplete storage in New Bullards Bar Reservoir and its cold water pool, which would adversely impact subsequent water temperatures, instream flows, and consumptive use deliveries. (S-YCWA 18, p. 46.)

The YCWA analysis shows that the water temperature recommendations made by DFG and NMFS in 2000 would be even more difficult to meet than the temperatures proposed in the 1996 Draft Decision. Required water releases could exceed 3,500 cfs. (S-YCWA 34.) The YCWA analysis indicates that if no cap were placed on water releases, over three million acre feet per year would be needed to attempt to meet the proposed water temperature requirements. (S-YCWA 34 and 35; R.T. 2586:4-2587:4.) If required releases were capped at 3,500 cfs, the YCWA analysis shows the proposed requirements often would not be met (S-YCWA 32), and substantial quantities of additional water, up to 2 million acre-feet per year, would be needed to attempt to meet the requirements. (S-YCWA 33; R.T. 2583:1-2589:3.) These quantities exceed the total average unimpaired flow in the Yuba River Basin. (S-YCWA 19, p. 3-2.) If DFG's proposed temperature requirements were implemented as instantaneous maximums, it would be even less feasible to meet the requirements due to the significant differences between daily mean and maximum water temperatures at Marysville. (S-YCWA 19, p. 3-2.)

6.6.5 Conclusions Regarding Water Temperature

The SWRCB recognizes that compliance with requirements to provide suitable water temperatures year-round for all lifestages of chinook salmon and steelhead is not feasible in the lower Yuba River prior to the construction of additional facilities to improve the ability to manage water temperature. However, maintenance of suitable water temperatures should be given a high priority

when feasible. Based on the findings and conclusions above, the SWRCB concludes that YCWA should be required to make reasonable efforts, as described below, to operate the Yuba River Development Project to maintain suitable water temperatures in the lower Yuba River for fall, late fall, and spring-run chinook salmon and steelhead.

YCWA should be required to consult with ~~the~~ a Temperature Advisory Committee, including representatives from SWRCB, SYRCL, CSPA, DFG, USFWS, and NMFS, on a regular basis from May through October of each year. Consultations with the Temperature Advisory Committee should include current operations for temperature control in order to provide suitable habitat for anadromous fish. YCWA should make changes to project operations for temperature control as recommended by the Temperature Advisory Committee on a real-time basis, unless YCWA ~~demonstrates to the Chief of the Division of Water Rights within 14 days~~ determines that the Committee's recommendation is infeasible and notifies the Chief of the Division of Water Rights of the reasons for that determination within 14 days.

Prior to April 1 of each year, YCWA should prepare an annual operations plan for water temperature control in consultation with the Temperature Advisory Committee. The plan should specify actions to be taken to maintain suitable water temperatures for anadromous fish. The plan should include operations for the subsequent May through October period. The plan should be submitted to the Chief of the Division of Water Rights for review by April 1 of each year.

YCWA should monitor water temperatures on a continuous basis at the Smartville Gage, Daguerre Point Dam, and the Marysville Gage. YCWA should operate and maintain gages at these locations as needed for reliable measurement of water temperature. YCWA should prepare an annual report that summarizes the results of water temperature monitoring for the previous water year at the specified locations and describes operations to minimize water temperature impacts on anadromous fish. The monitoring report covering the previous water year should be submitted to the Chief of the Division of Water Rights by December 31 of each year.

This decision directs the YCWA to diligently pursue development of the Narrows II Powerhouse Intake Extension Project at Englebright Dam, in coordination with the USFWS, the DFG, and NMFS. YCWA should submit a report to the Chief of the Division of Water Rights on the status of its application for funding and the progress of project development every six months from the date of this decision through the completion of project construction. Following construction, the Narrows II Powerhouse Intake Extension at Englebright Dam should be operated in conjunction with the multi-level outlet structure at New Bullards Bar Dam to minimize water temperature impacts on anadromous fish in the lower Yuba River. The effects of project operations should be monitored and, in consultation with the Temperature Advisory Committee, modifications should be made on a real-time basis to minimize adverse fishery impacts.

The SWRCB will retain continuing authority over the establishment of water temperature requirements for the lower Yuba River. Following construction of the Narrows II Powerhouse Intake Extension Project at Englebright Dam and subsequent monitoring of water temperatures, the SWRCB may establish water temperature requirements for protection of fishery resources.

6.7 Requirements for Fish Passage Facilities and Fish Screens

YCWA currently supplies water to the Hallwood Irrigation Company, Cordua Irrigation District, Ramirez Water District, Browns Valley Irrigation District, Brophy Water District, South Yuba Water District, Naumes, Inc., Wilbur Ranches, and Dry Creek Mutual Water Company.

(S-YCWA 27.) Daguerre Point Dam is currently operated by the Corps of Engineers. Water is diverted at the dam to supply water to districts located both north and south of the Yuba River. Three major diversion facilities are located at or just upstream of the Daguerre Point Dam: (1) the Browns Valley Pumpline Diversion Facility, (2) the South Yuba/Brophy Water District South Canal, and (3) the North Canal that serves Hallwood, Cordua and Ramirez. Diverters using these facilities divert under their own water rights, purchase water from YCWA, or both. Most water diverted from the lower Yuba River for irrigation is delivered from March through mid-October. In addition, an average of 41,790 acre-feet has been diverted in recent years (1987-1999) from October 15 through December for the purposes of rice straw decomposition and waterfowl habitat. (S-YCWA 27.)

The North Canal (also referred to as the Hallwood-Cordua Diversion) is a gravity flow diversion structure located on the north bank of Daguerre Point Dam, with a present diversion rate of up to 625 cfs. The Browns Valley Pumpline Diversion Facility uses a pump with a present diversion capacity of 80.2 cfs, located on the north bank of the Yuba River about nine-tenths of a mile upstream of Daguerre Point Dam. The South Canal is a gravity flow diversion with a present capacity of 380 cfs located on the south bank of the river, just upstream of Daguerre Point Dam. South Yuba and Brophy plan to expand the capacity of the South Canal to 700 cfs.

The potential for loss of juvenile chinook salmon and steelhead to impingement, entrainment and predation at the diversion facilities is significant. In 2000, DFG presented evidence that 437,770 fish were salvaged in a single season at the Hallwood-Cordua Diversion, with up to 40,000 juvenile fish salvaged in a single day. (S-DFG 1, p. 2.) This is consistent with testimony presented by YCWA in 1992 regarding ~~losses~~ [salvage](#) of juvenile salmon at that location. (YCWA 80.)

The number of chinook salmon entrained at a diversion facility is related to the percent of flow diverted. (R.T. II, 233:9-233:19; R.T. III, 178:1-78:20 and 87:12-88:1; R.T. XIX, 162:8-165:4.) An analysis of the daily North Canal fish screen trap records for 1972 to 1991 by the USFWS shows that the number of juvenile salmonids entering the trap is directly related to the percent of streamflow diverted. (USFWS 17; R.T. XIV, 162:8-165:4.) DFG also presented testimony indicating that the number of emigrating salmonid juveniles trapped at the North Canal fish screen went down significantly when flows at Marysville were above 2,000 cfs. (R.T. III, 78:1-78:20.) The present combined diversion rate of the three diversion facilities near Daguerre Point Dam is 1,085 cfs. Under the flows required by the 1965 Agreement, water diversions at those three facilities could potentially be as high as 82 percent of total streamflow during the April and May emigration period for spring and fall-run chinook salmon and steelhead. A significant number of juvenile salmonids could be lost due to diversions of such a high percentage of total flow. (R.T. II, 233:19-234:9 and 239:11-239:15; R.T. III, 74:23-75:20 and 187:12-188:1.) In addition, the total

quantity of water diverted and the instantaneous diversion capacity are both expected to increase due to increased demands in the future. (S-YCWA-15.) Therefore, the potential loss of fish at the major diversion facilities remains a significant problem.

The recent listings of Central Valley steelhead under the federal ESA, and Central Valley spring-run chinook salmon under both the state and federal endangered species acts, increase the importance of minimizing entrainment losses at these diversion facilities. Section 9 of the federal ESA prohibits certain activities that directly or indirectly affect endangered species. Under Section 4(d) of the ESA, the Secretary of Commerce is required to adopt regulations deemed necessary and advisable for the conservation of species listed as threatened, which may include extending any or all of the prohibitions of Section 9 to threatened species. On July 10, 2000, NMFS issued a final Section 4(d) rule governing the take of Central Valley steelhead. The NMFS rule defines “constructing or operating dams or water diversion structures with inadequate fish screens or fish passage facilities in a listed species’ habitat” as a type of activity that is very likely to injure or kill salmonids and result in a prohibited take of the protected species.

Loss of fish at the diversion facilities could be significantly reduced by installation of fish screens that meet the criteria established by NMFS and DFG. NMFS and DFG have established standard fish screen design criteria for the protection of juvenile chinook salmon and steelhead. (S-DFG 34; S-DFG 34, Attachment A; S-BVID 12 and 13.) Funding for construction of fish screens in the Sacramento River basin is available through the Anadromous Fish Screening Program authorized by the Central Valley Project Improvement Act, the CALFED program, and bond funds provided under Proposition 204. (S-R.T. 367:24-368:8; S-R.T. 1973:4-1973:11; S-R.T. 2197:23-2198:3.) The current condition of fish passage facilities and fish screens and the need for improvements are addressed in Sections 6.7.1 through 6.7.4 below.

6.7.1 Daguerre Point Dam

Fish passage facilities at Daguerre Point Dam include two fish ladders, one on the north and one on the south end of the dam. DFG presented testimony that operation of the existing ladders at

times inhibits upstream migration of adult fall-run chinook salmon, spring-run chinook salmon, steelhead, and potentially late fall-run chinook salmon. (S-R.T. 1957:17-1957:24; S-R.T. 2007:11-2008:24.) DFG also presented testimony that adult fall-run chinook may be delayed in their upstream migration in the fall months, resulting in illegal take in the vicinity of the dam. (S-R.T. 2007:20-2007:24.) The Corps of Engineers past operational criteria required that the ladders be physically closed when water elevations reached 130, or when flows were slightly less than 10,000 cfs. This standard resulted in periodic ladder closures during the fall through the spring, potentially impacting passage of fall-run chinook and/or steelhead. Testimony indicated that, at times, the ladder has been closed for weeks or a month at a time. (S-R.T. 2007:25-2008:12.)

DFG presented testimony that over the last approximately ten years, from July 1989 through December 1999, the north and south ladders have obstructed passage to some extent, either through gate closures or insufficient ladder exit openings, for a period of 766 days on the north ladder and 425 days on the south ladder. These were primarily during times when spring-run chinook or steelhead are expected to be present. (S-DFG 11 and 12; S-R.T. 2008:17-2008:24.) A witness for SYRCL testified that SYRCL has received numerous phone calls from the public over the last two and a half years regarding badly maintained or closed fish ladders at Daguerre Point Dam. (S-R.T. 405:11-405:25.)

DFG has requested the Corps of Engineers to address the fish ladder problems at Daguerre Point Dam. The Corps of Engineers currently maintains the ladders open when flows exceed elevation 130 and they have improved debris removal efforts. (S-R.T. 2121:22-2122:14.) NMFS has initiated consultation with the Corps of Engineers under Section 7 of the ESA regarding activities on the Yuba River, including fish passage facilities at Daguerre Point Dam. (S-RT 205:11-206:9.) The USFWS Anadromous Fish Restoration Program includes evaluation and improvement of fish passage at Daguerre Point Dam as a restoration action in its revised draft restoration plan. (S-R.T. 258:24-259:17.) In 1996, USFWS funded the Corps of Engineers to initiate an evaluation

of fish passage improvement at Daguerre Point Dam. (S-R.T. 261:4-262:3; S-R.T. 2122:15-2122:17.)

The Corps of Engineers is not a party to this proceeding. Although the SWRCB lacks authority in this proceeding to require the Corps of Engineers to improve fish passage at Daguerre Point Dam, the SWRCB strongly encourages USFWS, the Corps of Engineers, DFG, NMFS, and other appropriate parties, to cooperate in development of a project to improve fish passage at Daguerre Point Dam.

6.7.2 Browns Valley Pumpline Diversion Facility

Browns Valley Irrigation District presented testimony in 2000 that a state-of-the-art fish screen has been installed at the Browns Valley Pumpline Diversion that meets the current NMFS and DFG screening criteria for protection of chinook salmon and steelhead. (S-BVID 1, pp. 4-9; S-BVID 5 through 15]; S-R.T. 1788:6-1791:18; S-R.T. 1822:10-1822:16; S-R.T. 1827:10-1827:16.) Funding for design and construction of the screen was obtained from DWR, the U.S. Bureau of Reclamation's CVPIA Anadromous Fish Screen Program, the California Urban Water Agencies Category III Account, PG&E, and YCWA. BVID contributed manpower and equipment to the construction and assumed the obligation to operate and maintain the fish screen. (S-BVID1, p. 4.) The screen became operational in April of 1999 and has operated for a full year to design specifications. (S-R.T. 1790:10-1790:21.) USFWS witnesses testified that the screen was built to DFG and NMFS criteria and that such screens are generally very effective. (S-R.T. 364:6-365:12.)

The SWRCB concludes that the new fish screen at the Browns Valley Pumpline Diversion Facility provides adequate protection for juvenile salmonids. Browns Valley Irrigation District should continue to operate and maintain the new fish screen in compliance with NMFS and DFG criteria.

6.7.3 South Canal Rock ~~Levee~~Gabion

The South Canal diversion facility diverts water from the Yuba River through a diversion channel into an old dredger pond on the south side of the river. A "leaky levee" rock gabion fish screen

was constructed across the dredger pond in 1985 in accordance with an agreement with DFG. Water passes through the rock levee into the other side of the dredger pond where it is diverted into the South Canal for delivery to South Yuba and Brophy Water Districts. Imbedded within the rock levee is a fine mesh plastic screen designed to prevent fry or juvenile salmonids from passing through the levee. A portion of the water diverted from the river reenters the river through a return channel at the downstream end of the dredger pond.²⁶ The amount of water diverted at the South Canal has steadily increased. In 1991, YCWA delivered about 89,000 acre-feet to Brophy and South Yuba.

Questions about adverse effects of the South Canal diversion facilities on fish concern the effectiveness of the rock levee in preventing loss of fish, as well as questions about the effect of the dredger pond and return channel on fish survival. Testimony was presented in 1992 that similar rock levee fish barriers have proven ineffective in other locations. (USFWS 8, p. 4; R.T. I, 109:18-109:24; R.T. II, 80:7-81:12; RT III, 96:14-96:20 and 135:11-138:1.) In 2000, a NMFS biologist testified that the rock levee at the South Yuba-Brophy diversion does not meet NMFS screening criteria. (S-R.T. 143:2-143:4; S-R.T. 198:22-199:4.) A DFG biologist testified that the rock levee at the South Yuba-Brophy diversion is considered an alternative fish screen, and that no alternative methods have come close to achieving the standards that the agencies have established for state-of-the-art fish screens. (S-R.T. 1975:1-1976:8; S-R.T. 2004:12-2005:4.)

Evidence was also introduced on the effects of the physical configuration of the dredger pond and the return channel on survival of fish diverted from the Yuba River. The construction of the rock barrier across the large dredger pond resulted in a relatively wide, deep pool directly in front of the rock barrier. The pool reduces the water velocity in the bypass channel which disorients juvenile salmon and delays their downstream migration. The pool also results in increased water temperature that is detrimental to salmon, and in increased fish mortality due to predation in the pool in front of the rock levee fish screen. (South Yuba 8, p. 2; R.T. II, 82:7-82:17; DFG 26, p. 99;

²⁶ Figure 7 of YCWA Exhibit 2 is a photograph showing the South Canal diversion.

R.T. I, 108:19-108:25; R.T. II, 108:23-109:12; R.T. III, 139:12-142:10, 150:20-151:15 and 217:16-218:6; S-R.T. 216:23-217:3.)

Water not diverted through the rock levee re-enters the river through a return channel that follows a meandering alignment rather than the relatively straight alignment shown on design plans included in the agreement with DFG. (South Yuba 5, p. 11.) USFWS presented data showing that bypass flows in the return channel were at times less than 10 percent of the water diverted. USFWS recommended that much higher bypass flows be maintained. (USFWS 7, p. 13; USFWS 8, p. 3.) Testimony was also presented that there has been a recurrent problem of blockage of the return channel. (R.T. XII, 93:20-94:19; R.T. XII, 123:16-124:5.) In addition, there is currently no way to prevent water from entering the diversion channel when water is not being diverted into the South Canal for irrigation. (USFWS 8, p. 3.) Therefore, losses at the diversion facilities due to predation and other factors occur even when no water is being diverted for beneficial use. Finally, USFWS presented evidence that deposition and accumulation of gravel and debris in the diversion channel as a result of floods or other events can adversely affect flow and migration of juvenile salmon through the diversion facility. (USFWS 7, p. 12.)

The potential for significant entrainment of juvenile salmonids at the diversion is evident in DFG's rotary screw trap sampling of outmigrating juveniles, started in 1999. Sampling indicates that "vast numbers" of juvenile and recently emerged chinook salmon and steelhead trout are present in the river virtually year-round. (S-DFG 1, p. 2; S-R.T. 1947:15-1948:18; S-R.T. 2005:7-2005:13.) Based on these data and information presented at the 1992 hearings, DFG concluded in 2000 that significant entrainment can and does occur at unscreened and inadequately screened diversions, including the South Yuba-Brophy diversion. (S-DFG 1, p. 2; S-R.T. 1947:15-1948:23.)

Evidence was presented in 1992 and 2000 that fish are entrained from the river into the dredger pond and the South Yuba-Brophy Canal. In April of 1989, the USFWS seined 31 juvenile chinook salmon ranging in size from 46 to 70 millimeter (mm) fork length in the diversion pond area

behind the rock gabion fish screen. Several hundred juvenile salmonids were also observed feeding in the same area on May 5, 1989. (USFWS 7, pp. 10-12.)

Fyke net sampling conducted by South Yuba consultants from May to July of 1993 also documents the continued loss of both chinook salmon and steelhead at the rock gabion. The South Yuba consultants collected 17 juvenile chinook salmon over 100 mm in length and two juvenile steelhead, 26 and 33 mm in length, at the outfall of the diversion pipe entering the South Yuba-Brophy Canal. A biological consultant for South Yuba testified that this was a very small number of juvenile steelhead. (S-DFG 35; S-South Yuba 2, pp. 7-11; S-South Yuba 2.2; S-R.T. 1142:7-1143:1.) However, a DFG witness testified that the fyke net used in the study may not have been efficient for small salmonids. (S-R.T.-2481:15-2482:11.) Fish averaging 94 mm in length were used in the net efficiency test. (S-South Yuba-2.2, p. 19.) The fyke net, constructed of 1/8 inch mesh (S-South Yuba 2.2, p. 8.) may not have been efficient for capturing small juvenile salmonids. The number of small juvenile steelhead entering the irrigation canal, therefore, may have been significantly underestimated in the South Yuba sampling.

The USFWS concluded that the salmon collected in 1989 behind the gabion most likely were washed into the pond during early March when river flows exceeded 20,000 cfs and over-topped the gabion structure. (USFWS 7, p. 12.) South Yuba ~~speculated~~concluded that the large size of juvenile chinook captured indicated that they entered the diversion pond during high flow periods in late January and late March, 1993. (S-DFG 35; S-South Yuba 2, p. 10; S-South Yuba 2.2, p. 15; S-R.T. 1144:18-1145:20.) Flow measurements at Marysville from 1969 to 1989 indicate that flows that overtop the levee (exceeding 20,000 cfs) have occurred numerous times in eight of those 20 years. (USFWS 7, pp. 6 and 12.) South Yuba presented testimony that the smaller steelhead captured in the 1993 study probably passed through the gabion structure. (S-South Yuba 2, p. 11; S-South Yuba 2.2, p. 19; S-R.T.1194:13-1194:23; S-R.T. 1145:21 – 1146:7.) Regardless of the manner in which fish enter the diversion pond, it appears that fish, including listed species, continue to be lost from the lower Yuba River fishery at the rock gabion. (S-R.T. 1974:20-1974:21.)

South Yuba contends that the diversion pond existed prior to the diversion of water at the South Canal, and that fish could have been washed into the pond at high flows and lost from the river prior to the existence of the diversion facilities. (S-R.T. 3102:7-3102:15.) While this may have occurred, the current rock gabion structure was built as a part of the South Yuba-Brophy diversion system and is intended to serve as a fish protective device to keep fish out of the diversion pond. To address the loss of fish at the South Canal, DFG recommends installation of a fish screen at the South Yuba-Brophy diversion that meets the criteria established by NMFS and DFG for fishery protection. (S-DFG 1, p. 4; S-R.T. 1957:12-1957:16; S-R.T. 2161:5-2161:11.)

In summary, considerable evidence was presented regarding the rock gabion fish screen and effects of other elements of the South Canal diversion facilities on fish survival. The SWRCB concludes that there is ample evidence showing that the continuing diversion of water from the Yuba River through existing facilities at the South Canal has reasonably avoidable adverse impacts on anadromous fish in the Yuba River. To continue the diversions at the South Canal without taking actions to reduce fish loss would be an unreasonable method of diversion with unnecessary harmful effects on public trust resources. The continuing loss of steelhead trout from the lower Yuba River at the South Yuba-Brophy diversion may also violate the ESA section 4(d) rule governing the take of Central Valley steelhead, which identified operation of inadequate fish screens as an activity likely to injure or kill listed salmonids. NMFS testified that once the 4(d) rule was in effect, ESA section 9 prohibitions against take of steelhead would apply. (S-R.T. 143:5-144:5.)

Those parties that supply or divert water at the South Canal have the responsibility to ensure that water diversions at that location do not result in a significant loss of fish. Therefore, in order to prevent unnecessary loss of fish at the South Yuba-Brophy diversion (South Canal), YCWA, Brophy, and South Yuba, should consult with NMFS, USFWS, and DFG to develop a plan to reduce fish losses and comply with all applicable requirements of the state and federal endangered species acts. If NMFS or DFG determines that a potential incidental take of listed species may

result from diversion of water into the South Canal, then YCWA, Brophy, and South Yuba should obtain appropriate authorization for the incidental take. In order to continue diversion of water at the South Canal, the plan to reduce fish losses, and any required incidental take authorization, should be provided to the Chief of the Division of Water Rights by December 31, 2001.

6.7.4 North Canal

The Hallwood-Cordua fish screen located at the North Canal utilizes a V-shaped perforated plate screen constructed, operated and maintained by DFG. A bypass system diverts fish captured by the screen into a collection tank. The collected fish are returned to the river either through a pipeline or by truck. (DFG 26, p. 98.) The design and current operation of the Hallwood-Cordua fish screen results in the loss of significant numbers of fish. Losses also occur due to predation near the face of the screen and upstream in the intake channel. Losses ranged from 19.0 to 50.2 percent for test groups released in 1977 and 1978. (DFG 26, p. 98.) Losses also occur due to the fish trapping facility that returns fish from the diversion canal to the river. (R.T. II, 85:9-85:17.) The long distance between the diversion channel intake, low bypass flows, and excessive handling of the fish stopped by the screen all contribute to the loss of salmonids at the Hallwood-Cordua fish screen. (R.T. I, 109:7-109:14; R.T. II, 84:13-85:17; R.T. XIV, 165:5-166:6; S-R.T. 2003:23-2003:25.)

DFG presented testimony that it has periodically operated the fish screen at the Hallwood-Cordua diversion since 1992 to prevent the unnecessary loss of juvenile chinook salmon and steelhead. Significant numbers of juvenile chinook salmon have been salvaged at the screen. DFG has only operated the screen during the peak fall-run smolt outmigration period in the spring (about April through early to mid-June). Operation is generally dependent on available funds and is often for a much shorter period of time. Water is diverted at the North Canal for a much longer period than the period in which DFG operates the screen. (S-DFG 1, p. 2; S-DFG 4; S-R.T. 1945:22-1946:14.)

DFG presented evidence indicating that significant numbers of juvenile steelhead are entrained and lost at the North Canal diversion. Past observations by DFG personnel indicate that the number of

juvenile steelhead entering the diversion was just beginning to increase when operations of the screen were terminated in late May and early June. In 1999 salvage operations were extended through August. The salvage of steelhead entering the diversion steadily increased through July and significant numbers continued to be present in August when DFG ceased operation of the screen. (S-DFG 1, p. 2; S-DFG 5; S-R.T. 1946:15-1947:15; S-R.T. 2000:3-2000:14.)

DFG began an outmigration study of juvenile salmonids in 1999, using a rotary screw trap located in the lower Yuba River near Hallwood Boulevard. [DFG reported that](#) significant numbers of juvenile chinook salmon, including spring-run, have been captured. Recently emerged steelhead are present throughout the summer months. Steelhead as small as 24 mm have been observed in July, with 27 and 37 mm fish observed in August and September. It is evident, based on the size and numbers of juvenile steelhead and chinook salmon present throughout the year, that large numbers of fish are vulnerable to entrainment at the Hallwood-Cordua Diversion. DFG concluded that significant entrainment occurs at inadequately screened diversions, including the Hallwood-Cordua diversion. (S-DFG 1, p. 2; S-DFG 7; S-R.T. 1947:15-1948:23; S-R.T. 2000:3-2001:5.)

In addition, DFG presented testimony that the 5/32 inch mesh size of the Hallwood-Cordua fish is much larger than the 3/32 inch mesh currently recommended by both DFG and NMFS. (S-R.T. 2004:4-2004:6; S-R.T. 2438:15-2438:17.) The smaller mesh size does not protect recently emerged steelhead fry. (S-R.T. 2003:20-2003:23.) The ineffectiveness of the screen in salvaging fry-size fish is evident when comparing catches at the screen with catches in the rotary screw trap during the same period. In periods when catches of fry-size fish were still high in the rotary screw trap, the fish screen was capturing no fish in that size range. (S-DFG 42; S-R.T. 2437:23-2439:25.) In addition, the approach velocity at approximately 25 percent of the screen area exceeds approach velocities that are currently recommended. (S-R.T. 2004:6-2004:11; S-R.T. 2438:12-2438:15.)

In summary, substantial evidence was presented that significant fish losses occur at the Hallwood-Cordua fish screen, including losses of listed species. DFG recommended installation of a fish

screen at the Hallwood-Cordua diversion that meets the criteria established by NMFS and DFG for protection of juvenile chinook salmon and steelhead. (S-DFG 1, p. 4; S-DOI 4; S-R.T. 1957:12-1957:16; S-R.T. 2161:5-2161:11.) The SWRCB concludes that the continuing diversion of water from the Yuba River through existing facilities at the North Canal has reasonably avoidable adverse impacts on anadromous fish in the Yuba River. To continue diversions at the North Canal without taking steps to reduce fish loss would be an unreasonable method of diversions with unnecessary effects on public trust resources. The continuing loss of steelhead trout from the lower Yuba River at the North Canal diversion may violate the ESA section 4(d) rule governing the take of Central Valley steelhead, which identified operation of inadequate fish screens as an activity likely to injure or kill listed salmonids.

Those parties that supply or divert water at the North Canal have the responsibility to ensure that water diversions at that location do not cause a significant loss of fish. Therefore we conclude that, in order to prevent unnecessary loss of fish at the Hallwood-Cordua diversion (North Canal), YCWA, Hallwood, Cordua, and Ramirez should consult with the NMFS, USFWS, and DFG to develop a plan to reduce fish losses resulting from diversion of water into the canal and comply with all applicable requirements of the state and federal endangered species acts. If potential take of listed species is determined by NMFS or DFG to result from diversion of water into the North Canal, YCWA, Hallwood, Cordua, and Ramirez should obtain appropriate authorization for incidental take. In order to continue diversion of water at the Hallwood-Cordua diversion, the plan to reduce fish losses, and any required incidental take authorization, should be provided to the Chief of the Division of Water Rights by December 31, 2001.

6.8 Impacts of Return Flows from the Yuba Goldfields on Fishery Resources

The Yuba Goldfields are composed of approximately 11,000 acres of land adjoining the Yuba River. In 1992, YG Development Co. and Western Aggregates, Inc. owned much of the property in the Yuba Goldfields area and participated in the hearing at that time. At the most recent hearing in 2000, Western Aggregates, Inc. and Western Water Company participated as claimants to water

rights in the Yuba Goldfields area.²⁷ The ownership interests of the various parties claiming to own land or water rights in the Yuba Goldfields are not well defined from the evidence in the record.

The Yuba Goldfields contain several interconnected dredger ponds that create a meandering channel that discharges into the Yuba River approximately one and one half miles below Daguerre Point Dam. The channel once returned water to the river through a wide, braided channel over a gravel bar which did not attract a significant number of salmon. The present channel configuration returns a more concentrated flow through a narrow channel which attracts upstream migrating salmon into the Goldfields area.

~~To facilitate dredging operations, YG Development, Western Aggregates, Inc. and their predecessors have constructed check dams in the channels which are operated to regulate water elevation and return flow to the Yuba River. Water in the goldfields channels comes from underflow of the Yuba River, precipitation run-off, and water that was diverted from the river via the South Canal.~~

In 1989, the USFWS studied spawning and rearing of anadromous fish in the Yuba Goldfields. The USFWS found that a substantial number of anadromous fish were attracted into the goldfields by flow in the return channel. The fish spawn in the goldfields area, but the resulting offspring have a relatively poor chance of survival due to: (1) fluctuations in water levels which result in dewatering redds and stranding fry, (2) relatively high water temperatures, and (3) extensive predation. (USFWS Exh. 7, pp. 5-10.) ~~The high temperature of the discharge waters from the goldfields can also adversely affect water temperatures in the lower Yuba River.~~

²⁷ [In a letter dated November 27, 2000, Michael Patrick George, President of Western Water Company, advised the SWRCB that Western Water is a “successor by name change to YG Development Company.” Mr. George’s written testimony states that Western Water Company’s “predecessor companies” were “generally known as Yuba Consolidated Goldfields, Inc.” \(S-Western Water Company/Western Aggregates, Exhibit 5.\)](#)

The Yuba Goldfields return channel is the result of substantial alterations in the Yuba Goldfields area adjoining the Yuba River. In 2000, USFWS testified that the AFRP program has completed a feasibility and preliminary engineering study on a permanent barrier to eliminate access of adult salmon to the Yuba Goldfields. The current project design for the Yuba Goldfields Adult Fish Exclusion Barrier is a large graduated rock gabion structure. When complete, the project would be effective in preventing adult salmon from entering the Yuba Goldfields at all flows, except for hundred-year flow events. Funding for construction has not yet been identified. (S-R.T. 261:21-261:23; S-R.T. 332:17-333:4; S-R.T. 344:4-344:21; S-R.T. 346:13-347:2; S-R.T. 363:6-364:2.)

The existing diversion and use of water in the Yuba Goldfields, including the method by which water is returned to the river, results in adverse impacts on anadromous fish in the Yuba River. Continuation of existing practices after identification of ~~an effective~~ a reasonable way to reduce fish loss would constitute an unreasonable method of diversion and use of water in violation of article X, section 2 of the California Constitution and Water Code section 100.

In order to minimize adverse impacts to anadromous fish in the lower Yuba River, the SWRCB concludes that YG Development Co., Western Water Company and Western Aggregates (or their successors in interest) should be required to consult with YCWA, DFG, USFWS, and NMFS, and work cooperatively on the development of a project to eliminate access of adult salmon to the Yuba Goldfields. This decision requires YG Development Co., Western Water Company and Western Aggregates to submit a report to the Chief of the Division of Water Rights on the progress of project development every six months beginning July 1, 2001 and every six months thereafter until completion of project construction. ~~This decision also requires those parties to contact the California Regional Water Quality Control Board for the Central Valley Region to determine if a waste discharge requirement is needed for the discharge of water to the Yuba River from the return channel leaving the Yuba Goldfields.~~

7.0 LOWER YUBA RIVER WATER REQUIREMENTS FOR CONSUMPTIVE USES AND WATERFOWL HABITAT WITHIN YUBA COUNTY

In evaluating the feasibility of meeting the instream flow requirements established in this decision for protection of public trust resources, the SWRCB must consider competing demands to divert water from the lower Yuba River for other uses. YCWA's estimates of present and future diversion demands are discussed in Sections 7.1 and 7.2 below. Sections 7.3 through 7.5 explain the basis for the water demand figures used by the SWRCB in analyzing the feasibility of meeting the instream flow requirements established in this decision.

7.1 Present Level of Demand Estimated by YCWA

At the hearings in 1992 and 2000, YCWA provided estimates of the quantity of water needed from the lower Yuba River to meet the existing level of demand within YCWA's service area. (YCWA 13, p. 4; S-YCWA 15, p. 2, 7-11; S-YCWA 15A..) In 1992, YCWA estimated that its existing level of demand was 295,750 acre-feet during normal years and 302,850 acre-feet during dry years.²⁸ At the hearing in 2000, consultants for YCWA presented an updated estimate of 308,412 acre-feet per year as the average present level of demand. Using the five water year types identified in the Yuba River Index (S-YCWA 14), YCWA estimated that the "present level of demand" is 305,298 acre-feet in wet and above normal years, and 311,081 acre-feet in below normal, dry, and critical years. As in 1992, YCWA's estimates of the present level of demand were based on multiplying an ~~assumed~~-estimated water requirement per acre for a given crop by the estimated number of acres of that crop ~~thought to be~~ planted in the area served by YCWA and adding approximately 10 percent to cover conveyance losses. (S-YCWA 15, p.2.)²⁹ YCWA's current water demand estimates also include an allowance of 1.0 acre-foot per acre for 90 percent of the net rice acreage in the service area. The additional 1.0 acre-foot per acre is for fall flooding of rice fields to aid in decomposition of rice stubble and to provide waterfowl habitat. (S-YCWA 15, p. 3.)

²⁸ YCWA's values for existing agricultural water demand presented in 1992 were developed using 1984 data related to land use, estimated values for applied water for various crops, and estimated conveyance losses. (YCWA 45, pp. 4-1 to 4-8.) YCWA presented testimony that this methodology (continued next page)

In order to compare YCWA's "present level of demand" estimates with actual water diversions, SWRCB staff requested YCWA to provide data on recorded historic surface water diversions from the lower Yuba River for the period 1987 to 1999 by entities under contract with YCWA.

(S-R.T. 1490:11-1490:13.)³⁰ Appendix 2, Table 2-1 shows the ~~quantity~~ quantities of water delivered to each entity served by YCWA from 1987 through 1999 for irrigation (S-YCWA 27) and estimated demands for fall flooding and waterflow habitat deliveries. Table 13 below shows a comparison of YCWA's estimated present level of demand in 2000 with reported historic water deliveries for the period 1987 to 1999. (S-YCWA 15A, Table 10.)³¹ In 1991 and 1994, water users within YCWA's service area increased their use of groundwater in order to allow YCWA to transfer surface water to areas outside of Yuba County. The increased use of groundwater offset a like amount of surface water that would have been used in the YCWA service area. Therefore, the quantities of pumped groundwater shown in the table for 1991 and 1994 are included in the column for total reported historic diversions for 1991 and 1994.

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was used to determine water demand because YCWA did not have complete records for contractual sales or water deliveries. (R.T. VI, 141:19-142:15.) YWCA's 1992 estimates of agricultural water demand include additional quantities of water for irrigation following critical dry winters. (YWCA 13, p. 4.)

²⁹ YCWA's most recent estimates of irrigation demand reflect an assumed reduction in demand of 0.4 acre-foot per acre for non-rice and non-pasture crops in above normal and wet years due to differences in soil moisture, precipitation, and other factors. (S-YCWA 15, p. 9.)

³⁰ The 1987 to 1999 period was selected as most representative of present conditions. Diversions to the South Yuba Canal began in 1986. Deliveries to Dry Creek Mutual Water Company did not begin until 1998. Dry Creek Mutual received 1,402 acre-feet in 1998 and 3,976 acre-feet in 1999. (S-YCWA-15A, p. 11.)

³¹ The figures for annual historical diversions shown in Table 13 are from Exhibit S-YCWA 15A which was introduced during the 2000 hearing as a correction of figures presented in Exhibit S-YCWA 15. The figures in Table 13 for average "total reported historic diversions" for wet and above average years and for below normal, dry and critical years have been revised to correct an apparent arithmetical error in Table 10 of Exhibit S-YCWA 15A.

TABLE 13

YCWA’S HISTORIC AND ESTIMATED PRESENT LEVEL OF DEMAND FOR DIVERSIONS FROM THE LOWER YUBA RIVER (ACRE-FEET)

WATER YEAR	WATER YEAR TYPE	REPORTED HISTORIC SURFACE WATER DIVERSIONS	PUMPED GROUNDWATER USED FOR IN BASIN IRRIGATION	TOTAL REPORTED HISTORIC DIVERSIONS INCLUDING GROUNDWATER PUMPED TO ENABLE WATER TRANSFERS	ESTIMATE OF PRESENT DIVERSION DEMAND STATED IN YCWA’S 2000 ANALYSIS
1987	C	252,805	-	252,805	311,081
1988	C	226,752	-	226,752	311,081
1989	BN	248,908	-	248,908	311,081
1990	D	280,001	-	280,001	311,081
1991	C	194,710	82,018	276,729	311,081
1992	C	249,766	-	249,766	311,081
1993	AB	239,774	-	239,774	305,298
1994	C	238,954	26,033	264,987	311,081
1995	W	240,247	-	240,247	305,298
1996	W	262,551	-	262,551	305,298
1997	W	292,355	-	292,355	305,298
1998	W	233,054	-	233,054	305,298
1999	W	301,554	-	301,554	305,298
AVERAGE	-----	250,879	-----	259,191	308,412
AVERAGE	-----	261,588	-----	261,588	305,298
(W, AB)					
AVERAGE	-----	241,699	-----	257,134	311,081
(BN, D, C)					

W = Wet; AB = Above Normal; BN = Below Normal; D = Dry; C = Critical

As indicated in Table 13, YCWA's estimated “present level of demand” in 2000 exceeds the average of reported diversions for 1987-1999 by an average of 49,221 acre-feet per annum.

During wet and above normal water year types, YCWA's 2000 estimated present level of demand exceeds the average of reported diversions by 45,520 acre-feet per annum. During below normal, dry and critical water year, YCWA's 2000 estimates exceed the average of reported diversions by 52,574 acre-feet per annum.

Although, YCWA estimates that it has a present demand of 305,298 acre-feet per year in wet and above normal years, the only year in which reported historic diversions have exceeded 300,000 acre-feet was in 1999. Reported deliveries for waterfowl habitat in 1999 reached a record level of 62,543 acre-feet, well in excess of the 39,162 acre-feet diverted for waterfowl habitat in the previous year or the 34,000 acre-feet per annum that YCWA's consultants used as a reasonable figure in developing their estimate of YCWA's overall water demand. (S-YCWA 27; YCWA 45, p. 4.) Diversion of 34,000 acre-feet of water for waterfowl habitat in 1999, rather than the 62,543 acre-feet reported, would have reduced YCWA's total diversions for water year 1999 to approximately 273,011 acre-feet.

Due to the many variables involved, estimating the water demand from the lower Yuba River is a difficult task. In the absence of actual water delivery data, the estimates of present water demand developed by YCWA's consultants could be used to provide a rough estimate of the present level of demand for surface water from the lower Yuba River. However, when data on actual water deliveries for recent years is available, examination of that data provides a better understanding of the actual present level of demand.³² Relying on overly high estimates of the level of demand for offstream water deliveries may result in forecasting delivery deficiencies that are more frequent and more severe than would actually occur as a result of meeting the instream flow requirements established in this decision. The water demand figures applied by the SWRCB in evaluating the feasibility of meeting the instream flow requirements established in this decision are discussed in Section 7.3 below.

7.2 Full-Development Level of Demand Estimated by YCWA

At the hearing in 2000, YCWA's consultants predicted that in the future, under "full-development conditions," YCWA will have an average demand of 347,136 acre-feet per annum for irrigation and waterfowl habitat purposes and an additional 30,000 acre-feet for municipal and industrial uses. (S-YCWA 15, pp. 1, 7-9.) YCWA's "full development level of demand" for all purposes

³² There is no evidence in the record that water deliveries by YCWA were curtailed due to insufficient water to meet demand in the YCWA service area.

was estimated to be an average of 377,136 acre-feet per annum.³³ The major difference between YCWA's estimate of its current and full development level of demand for irrigation and waterfowl habitat purposes is that the full development estimate includes YCWA's proposal to provide water to the Wheatland Water District and the Wheatland Water District "detachments." (S-YCWA 15, p.7.) YCWA's estimated future demand for serving Wheatland Water District and its detachments is an average of 40,855 acre-feet per year, none of which is currently delivered. (S-YCWA 15, p. 8.) Thus, the sum of 40,855 acre-feet to be delivered to the Wheatland area plus 30,000 acre-feet for potential municipal and industrial uses would result in a projected increase in average annual demand of 70,855 acre-feet per year.

As YCWA's report on Lower Yuba River Diversion Requirements indicates, the timing for attaining the full-development of demand is uncertain. (S-YCWA 15, pp. 2, 7.) The Wheatland Water District and the Wheatland Water District detachments are located in the southern portion of the county in an area that does not yet have a water distribution system and does not presently have a water service contract with YCWA. (S-YCWA 15, p.7.) At the hearing in 1992, YCWA presented testimony that the construction of a canal to serve these areas was expected to occur in about five years. (R.T. V, 156:21-156:24.) [Evidence presented in 2000 indicates that the distribution system is still in the planning stages.](#) (S-YCWA 11, p. 13.)

The continuing absence of water supply contracts and a water distribution system eight years later leads the SWRCB to conclude that the [proposed](#) delivery of 40,855 acre-feet of water to the Wheatland area projected by YCWA remains ~~highly speculative.~~ [uncertain. In most years there would be sufficient surface water available from the lower Yuba River to meet YCMA's present level of demand plus the projected water demands in the Wheatland area. However, in a few years, irrigation in the Wheatland area will continue to be dependent upon use of groundwater](#)

³³ For dry, critical and below normal water years, YCWA estimates its full development level of demand for all purposes at 381, 936 acre-feet. For above normal and wet years, YCWA estimates that its full development level of demand will be 375, 688 acre-feet.

unless the demand for surface water in other areas of the YCWA service area is reduced through a conjunctive use program or increased water conservation.

The three major urban areas in Yuba County (Marysville, Linda-Olivehurst, and Wheatland) all rely on groundwater. (YCWA 2, p. 12.) Although municipal and industrial uses are authorized under YCWA's permits, YCWA had not diverted any water from the Yuba River for municipal use in Yuba County at the time of the 1992 hearing. At that time, YCWA estimated that new urban demand for water from the lower Yuba River would range from 30,000 to 50,000 AFA within the next 50 years. (YCWA 13, p. 5.) YCWA's Report on Lower Yuba River Diversion Requirements presented at the supplemental hearing in 2000 ~~assumes~~ estimates that 30,000 acre-feet per year ~~would~~ will be needed for municipal and industrial uses. (S-YCWA 15, p. 9.)

Although 30,000 acre-feet for municipal and industrial uses was included in YCWA's estimate of the full-development level of demand to be served from the lower Yuba River, YCWA's consultants stated that "[p]rojected future M&I diversion requirements for Yuba River water below New Bullards Bar Reservoir cannot be defined with the same level of confidence as the projected irrigation diversion requirement." (S-YCWA 15, p. 8.) The Report on Lower Yuba River Diversion Requirements mentions several factors that could influence the amount of water needed for future municipal use, but does not clearly describe the basis for the projected increase in water demand for municipal and industrial use.

Based on the evidence in the record, we conclude that the need for lower Yuba River water for irrigation in the Wheatland area and for additional municipal and industrial uses in Yuba County has not been established. To the contrary, the estimates of future water demand for those purposes appear nearly as speculative in 2000 as at the earlier hearing in 1992.³⁴ In evaluating

³⁴ The uncertainty in estimates of future water demand in the YCWA service is evident when comparing YCWA's estimates of future water demand for irrigation and waterfowl habitat at the 1992 hearing with its revised estimates at the 2000 hearing. In 1984, for example YCWA's consultants estimated that the future demand for water from the lower Yuba River for irrigation and waterfowl habitat would be 368,540 acre-feet per year. (YCWA 45, p. 4-8.) By (continued next page)

the feasibility of the instream flow requirements established in this decision, we conclude it is more reasonable to use the water demand figures described in Section 7.3 below based on recent historical water use for irrigation and a reasonable allocation for waterfowl habitat.

~~We~~ The SWRCB recognizes that there will be new uses of water in Yuba County in the future, but ~~there is no reason to assume that those uses cannot~~ we believe that a large portion of those uses can be met through more efficient use of existing water supplies or with water from other sources.³⁵ ~~In the event conditions change substantially and there is a compelling need for additional water from the lower Yuba River to meet future demands, the SWRCB can reassess the feasibility of complying with the instream flow requirements established in this decision at that time.~~

YCWA's comments on the Draft Decision dated November 7, 2000, stress YCWA's intentions to provide 16,743 acre-feet of water annually to the Dry Creek Mutual Water Company and to provide 40,855 acre-feet of water annually to Wheatland Water District and the Wheatland Water District Detachments. Section 8.4 of this decision discusses the procedure by which YCWA can request a temporary modification of applicable instream flow requirements if the projected deficiencies of surface water deliveries for offstream uses in a specific year exceed 20 percent of the projected demand for that year. The criteria for determining YCWA's overall "projected demand" for a particular year include provisions for estimating the projected water demand for use in the Dry Creek and Wheatland areas. The record remains unclear as to when and if the projected demands for surface water in the Wheatland and Dry Creek areas will be reached. However, under the provision discussed in Section 8.4, YCWA may request temporary modification of the instream

the time of the hearing in 2000, the YCWA estimate for those purposes was revised downward to 347,136 acre-feet per year. (S-YCWA 15, p. 8.)

³⁵ A 1990 report prepared for YCWA recognizes that, in addition to water from the lower Yuba River, future water supply needs in Yuba County may be met from a combination of sources including the Feather River, Bear River, groundwater supplies and improved efficiency in water application. (YCWA 45, pp. 2-3 and 4-8.)

[flow requirements in years in which YCWA would be unable to meet 80 percent of its overall demand, including the projected demands in a specific year in the Wheatland and Dry Creek areas.](#)

7.3 Factors Affecting Water Requirements for Irrigation

Irrigation demand depends on many factors, including cropping patterns. In the YCWA service area, the amount of land planted in rice has a particularly significant effect on total irrigation water requirements. The quantity of water required for rice irrigation is affected by several factors including the acreage planted, the applied water rate, and herbicide regulations. YCWA submitted data that indicates less water is used when crops are irrigated with groundwater rather than surface water. For example, YCWA assumes an applied water rate of 4.5 acre-feet per acre for rice irrigation using groundwater rather than 5.7 acre-feet per acre for rice irrigation with surface water. (YCWA 45, Table 5.)³⁶ The higher cost to pump groundwater may result in more efficient water use. Using the lower applied water rate for irrigation of a projected 35,876 acres of rice (S-YCWA 15, p. 8) would reduce estimated irrigation water demand by approximately 43,000 acre-feet per year.

Another factor influencing water demand for rice irrigation is regulation of allowable levels of herbicides in agricultural return flow water. A 1990 report prepared by YCWA's consultants states that more stringent limits on rice herbicides in return flow affect the detention periods for water used for growing rice. Due to the general trend toward reductions in organic chemicals allowed in return flows, YCWA's consultant predicted that the applied water rate for rice would tend to be reduced in the future. (YCWA 45, p. 4-3.) YCWA's full development level of demand estimates, however, continue to be based upon an assumed duty of water for rice of 5.7 acre-feet per acre. (S-YCWA 15, Appendix A.)

In general, the amount of surface water required for irrigation is a function of water use efficiency. A 1990 study prepared by YCWA's consultants indicates that approximately

³⁶ [YCWA has estimated that conveyance losses for surface water deliveries are approximately 10 percent. Therefore, it is reasonable to assume that approximately 5.0 acre-feet of surface water would be needed to deliver 4.5 acre-feet to the place of use.](#)

34 percent of the water estimated to be needed for irrigation in Yuba County would be available for recovery or reuse, or would flow into the Feather River or Bear River. (YCWA 45, pp. 2-1 and 2-2.) The study goes on to state that return flow rates in some areas are so high that "[s]ome of this return flow would need to be pumped from groundwater to prevent water logging." (YCWA 45, p. 4-7.)

The study on present and future water requirements submitted by YCWA in 1992 acknowledges that improved efficiency in water application and conjunctive use of groundwater storage and surface water storage should be explored as a "means of increasing the regulated water supply in Yuba County while fully meeting local requirements." (YCWA 45, p. 2-3.) Although YCWA has acknowledged a potential role for conjunctive use (S-YCWA 17), it did not ~~account for use of any water~~ include any water that may be available from a conjunctive use program in developing the estimates of "lower Yuba River diversion requirements" presented in Exhibit 15. Assistance in implementing more efficient water management practices is available to YCWA from the Department of Water Resources pursuant to Water Code section 10904.

At the time of the hearing in 1992, YCWA sold water to member districts for as low as one dollar per acre-foot. (R.T. IV, 61:10-61:12.) Testimony presented at the hearing in 2000 established that YCWA bills water districts in its service area a fixed amount based regardless of the amount of water they actually receive. (S-R.T. 1517:18-1517:23.) YCWA's full-development level of demand projections were based on the assumption "that the cost of water from YCWA would be very low and not be a limitation on the use of surface water for irrigation." (YCWA 45, p. 1-3.) In view of the chronic water shortages in many areas of the state, we do not believe it is reasonable for a large water purveyor to deliver large quantities of water for irrigation under a pricing system that provides no economic incentive to conserve.

Even under the existing pricing system, there have been some notable water conservation measures undertaken in the area receiving water from YCWA. During the 2000 hearing, representatives of water districts testified about water conservation measures undertaken by farmers in their districts. These measures include drip irrigation for orchards, laser leveling of rice fields and reuse of water

drained from rice fields for additional irrigation. (S-R.T. 1667:13-1670:3; 1686:15-1688:5; 1813:25-1815:22; 1817:21-1818:15; 3011:23-31012:19.) Browns Valley presented testimony that it had spent over \$2,000,000 replacing unlined canals with closed pipelines. (S-Browns Valley 1, p.3.) Water conservation measures undertaken by Browns Valley have enabled that district to reduce conveyance losses and serve many new customers with little change in the total amount of water diverted. (S-R.T. 1813:25-1815:22; 1817:21-1818:15.)

7.4 Water Requirements for Waterfowl Habitat

Flooding rice fields in the fall months of October, November and December promotes decomposition of rice stubble and provides waterfowl habitat. Dr. Frederic Reid, Director of Conservation Planning for Ducks Unlimited in Western North America, presented testimony that waterbird species prefer a water depth of under 10-inches in flooded rice fields and that the best management practice for rice straw decomposition is to keep rice stubble moist or very shallowly flooded. (S-Cordua 1, p.1-2.) YCWA has not established a goal of providing a specific number of acres of waterfowl habitat. (S-R.T. 1509:17-1509:25.) YCWA's consultants estimated the seasonal water requirement for fall flooding based on an application of 1.0 acre-feet of water per acre to 90 percent of the rice acreage. (YCWA 45, p. 4-7; S-YCWA 15, last page of Appendix A.) In 1992, YCWA estimated that total seasonal demand for flooding waterfowl habitat was 25,500 acre-feet of water and would increase at full development to 34,000 acre-feet. (YCWA 45, p. 4-7.)

Based on the crop acreage information presented in Appendix A of Exhibit S-YCWA 15, YCWA estimates that a total of 35,876 acres of rice will receive water deliveries from YCWA at full development. Using an application rate of 1.0 acre-foot per acre for 90 percent of the acreage planted in rice, and adding 10 percent to cover conveyance losses, would result in an estimated full development level of demand for waterfowl habitat of 35,516 acre-feet per annum. However, YCWA's water delivery data show that the average quantity of water delivered for waterfowl habitat for the period 1987 through 1999 was 41,790 acre-feet per year, with up to a maximum of 62,543 acre-feet delivered for waterfowl habitat in 1999. (S-YCWA 27.)

The reason for the discrepancy between the estimated water demand and the substantially greater quantities of water reportedly delivered for waterfowl habitat in some years is not clear from the record. [The SWRCB acknowledges that testimony was presented that use of water for waterfowl habitat can exceed 1.0 acre-foot per acre.](#) In view of the expert testimony of Dr. Frederic Reid (S-Cordua 1, pp.1 and 2), however, the SWRCB concludes that the reasonable use of water for waterfowl habitat should not exceed ~~the~~ [an average of 1.0 acre-foot per acre](#) [as assumed in the water demand analysis prepared](#) by the YCWA consultants, plus 10 percent for conveyance losses. The quantity of water needed for waterfowl habitat could actually be substantially less if rice fields were flooded sequentially using the water drained off of one field to flood another field as discussed by Dr. Reid. (S-R.T. 1320:3-1321:4.) Dr. Reid's testimony indicates that, in a dry year, flooding 7,000 acres of rice and 3,000 acres of seasonal and semi-permanent wetlands in the District 10 area of Yuba County would be a realistic goal for providing waterfowl habitat. (S-R.T. 1311:3-1314:6.)

7.5 Summary and Conclusions Regarding Water Demand from the Lower Yuba River in the YCWA Service Area

Water delivery records show that the historical water demand for irrigation in recent years has been much lower than YCWA's estimates of the present level of demand for irrigation. Conversely, the amount of water delivered for waterfowl habitat in many years has been greater than is justified based on the evidence in the record and the reasonable use limitations of article 10, section 2 of the California Constitution. YCWA's estimates of both the present and full development level of demand for surface water from the lower Yuba River do not appear to account for any significant water savings due to water conservation measures, nor do the YCWA estimates account for reduction in the use of surface water due to development of an ongoing conjunctive use program. As discussed in Section 7.2 above, YCWA's projected increases in demand for surface water from the lower Yuba River are very speculative.

To evaluate the potential effects of the flow requirements established in this decision on YCWA's water deliveries for other purposes, the SWRCB utilized the model discussed in

Section 8.1 below. In view of the problems with the water demand estimates developed by YCWA, the SWRCB concludes that it is more reasonable to use a water demand estimate based on recent historic water deliveries for irrigation plus a reasonable additional amount of water for waterfowl habitat and rice straw decomposition. Table 14 below shows historic irrigation water deliveries for water years 1987 through 1999 plus an additional amount of 35,516 acre-feet per year for waterfowl habitat purposes. The adjusted historic deliveries are shown graphically on Figure 6.

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TABLE 14

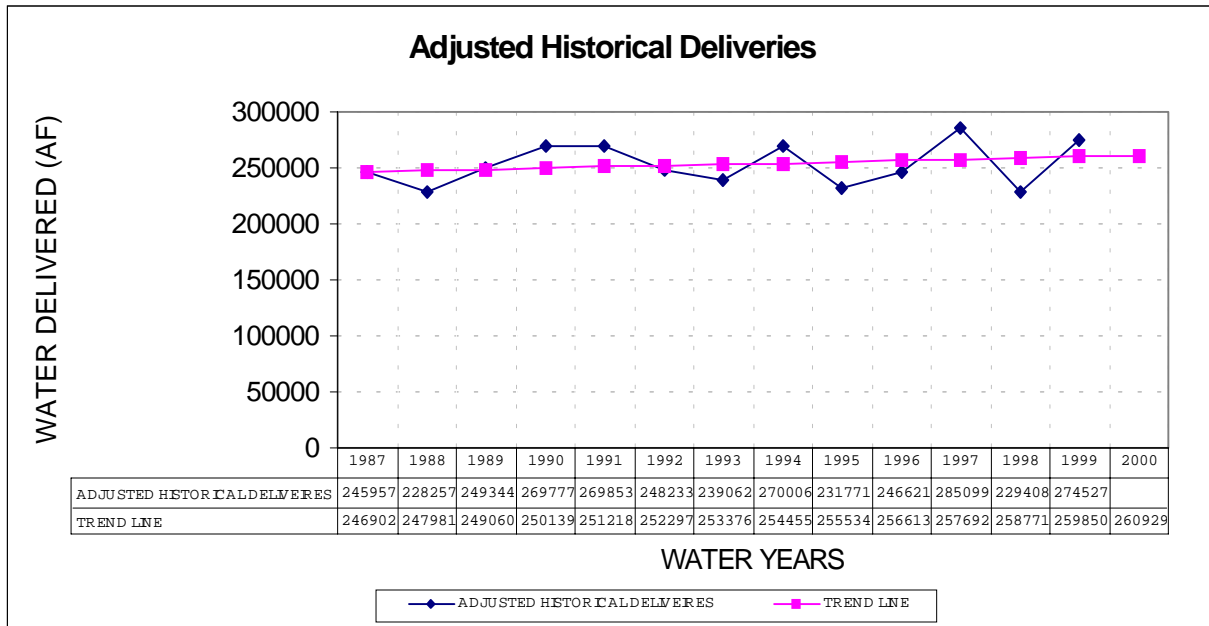
**ADJUSTED HISTORIC WATER DEMAND
FROM LOWER YUBA RIVER**

WATER YEAR	WATER YEAR TYPE	HISTORIC IRRIGATION DELIVERIES * (AC-FT)	ALLOCATION FOR WATERFOWL HABITAT DELIVERIES** (AC-FT)	TOTAL ADJUSTED HISTORIC DIVERSION DEMAND (AC-FT)
1987	C	210,441	35,516	245,957
1988	C	192,741	35,516	228,257
1989	BN	213,828	35,516	249,344
1990	D	234,261	35,516	269,777
1991	C	234,337	35,516	269,853
1992	C	212,717	35,516	248,233
1993	AB	203,546	35,516	239,062
1994	C	234,490	35,516	270,006
1995	W	196,255	35,516	231,771
1996	W	211,105	35,516	246,621
1997	W	249,583	35,516	285,099
1998	W	193,892	35,516	229,408
1999	W	239,011	35,516	274,527
AVE.	-----	-----	-----	252,916
AVE. (BN,D,C)	-----	-----	-----	254,489
AVE. (W,AN)	-----	-----	-----	251,081
MIN.	-----	-----	-----	228,257
MAX	-----	-----	-----	285,099
MEDIAN	-----	-----	-----	248,233
AVE. (5 HIGHEST YEARS)	-----	-----	-----	273,847

**Historic irrigation deliveries are from S-YCWA 27. The reported amounts include groundwater pumped to allow for surface water transfers to State Water Bank in 1991 (82,018 acre-feet) and in 1994 (26,033 acre-feet).*

*** The allocation for waterfowl habitat deliveries is based on flooding 90 percent of estimated rice acreage at a rate of 1 acre-foot per acre plus 10 percent for conveyance losses.*

FIGURE 6
ADJUSTED HISTORICAL DEMAND AND TREND LINE PLOT



Note: A simple linear regression was used for the development of the Trendline: (The R squared value equals 0.0493.)

Based on the information summarized in Table 14 and Figure 6 above, we conclude that, for modeling purposes, it is reasonable to take the average of the five highest years of adjusted historic demand as an estimate of YCWA's present level of demand for water from the lower Yuba River. As shown in Table 14, that figure is 273,847 acre-feet per year.³⁷ Because delivery data is available for a limited number of years and deliveries do not vary significantly by water year type, it is reasonable to use an average demand figure for all years without regard to water year types.³⁸ The method by which the estimated annual water demand was distributed into monthly diversion demands for use in modeling is described in Appendix 2. The effects of establishing the instream flow requirements specified in this decision on water deliveries for other purposes are discussed in Sections 8.0 through 8.5 below.

8.0 EFFECTS OF REVISED INSTREAM FLOW REQUIREMENTS ON OTHER USES OF WATER

Preceding sections of this decision address measures needed for fishery protection and the estimated quantities of water needed to meet current and projected water demands for other purposes. Due to substantial differences in hydrologic conditions and water demands each year, it is impossible to identify with certainty the effects that alternative instream flow requirements may have on water available for competing uses in future years. Although computer models are subject to inherent limitations due to inaccurate or incomplete input data and other factors, well-designed computer models of a river basin can provide the best means of evaluating what is likely to occur over a period of years under different scenarios. As discussed in Sections 8.1 through 8.5 below, in this instance, the SWRCB has utilized the Yuba River Basin Model,

³⁷ The average present level of demand would be expected to be somewhat lower due to the fact that the estimate of 273,847 acre-feet per year is based on the five highest years of irrigation deliveries and the fact that the figures for waterfowl habitat demand include acreage in the Wheatland area that does not yet receive water from YCWA.

³⁸ Based on the figures in Table 14, the average adjusted historic diversion demand for below normal, dry and critical water years is approximately one percent more than in wet and above normal years. However, the two years with the highest demand are both classified as wet.

developed by consultants for YCWA, to help evaluate effects of alternative instream flow requirements on the use of water for other purposes.

8.1 The Yuba River Basin Model

Consultants for YCWA have developed a model of the Yuba River Basin that can be used to simulate operation of the Yuba River Development Project under various conditions.³⁹ YCWA's Yuba River Basin Model is a monthly model that simulates the operations of major water facilities in the Yuba River Basin. YCWA consultants collaborated with one of the original authors of the Corps of Engineers HEC-5 program to develop an enhanced model that allows for more accurate representations of flow and storage dependent diversions on the lower Yuba River. (S-YCWA 13, p.11.) The original operational parameters and criteria for the Yuba River Basin Model were obtained from DWR's HEC-3 model of the Yuba River Basin. (S-YCWA 13, pp. 8-9.) YCWA's consultants have periodically modified the Yuba River Basin Model through collaborative efforts with DWR staff to improve the model as additional hydrology data becomes available.

On June 14, 1999, the SWRCB staff held a pre-hearing technical workshop. The purpose of the technical workshop was to provide SWRCB staff, staff from DWR's Modeling Support Branch, YCWA consultants, and others an opportunity to discuss hydrologic modeling of the Yuba River Basin to be done by DWR staff at the request of the SWRCB. (S-SWRCB 4; S-SWRCB 5.) In order to allow for evaluating the effects of alternative instream flow scenarios, the SWRCB [requested and received the Yuba River Basin model inputs from YCWA's consultants and purchased a copy of the ~~Yuba River Basin Model~~ modified HEC-5 software licensed from William Eichert.](#) (S-SWRCB 6.)⁴⁰

³⁹ The model developed for YCWA utilizes a HEC-5 general- purpose program developed by the Hydrologic Center of the U. S. Army Corps of Engineers. The HEC-5 program simulates the operation of flood control and water ~~conservation~~ [water storage and conveyance](#) systems, through calculations made by a period-by-period, upstream-to-downstream procedure. (S-YCWA 13, p. 9.)

⁴⁰ At the time of the 1992 hearing, YCWA's consultant had developed an operational model for the lower Yuba River and introduced testimony about predicted effects of the proposed instream flow and water temperature requirements recommended by DFG. However, the model was not introduced into the record or otherwise made (continued next page)

DWR's Modeling Support Branch examined the Yuba River Basin Model and compared the inputs used in the model with Yuba River system hydrology developed by the DWR Hydrologic Unit. Following installation and testing of the model, DWR's Modeling Support Branch staff concluded that the modified Yuba River Basin Model can be used as a tool to evaluate water supply impacts of alternative operating scenarios. (S-SWRCB 1; S-SWRCB 3.) In using the Yuba River Basin Model to simulate the effects of the flows specified in the 1996 Draft Decision, the DWR Modeling Support Branch staff reached results that are very similar to those reached by the YCWA consultants.

8.2 Alternatives Evaluated and Modeling Assumptions

For purposes of comparison, the Yuba River Basin Model was used to evaluate the effects of operating the Yuba River Development Project to meet three alternative instream flow scenarios: (1) flows under the 1965 agreement between DFG and YCWA; (2) the instream flow recommendations presented by YCWA at the hearing in 2000; and (3) the instream flow requirements established in this decision. The evaluation of each alternative also reflects the operational constraints under which the project operates as described in detail by YCWA. (S-YCWA 13.) Other assumptions used in the modeling are discussed below.

8.2.1 Water Year Classifications and Hydrologic Data

Five water-year type classifications (i.e., wet, above normal, below normal, dry and critical) as defined in YCWA's Yuba River Index (YRI), were used in evaluating the results under each of the three alternatives. (S-YCWA14.) The YRI follows the principles of the Sacramento Valley Index and the San Joaquin River Index and is based on the unimpaired runoff of the Yuba River for the period 1921 to 1994. The YRI is defined by three components in a 50-30-20 proportion: (1) the current year's April through July Yuba River unimpaired runoff (50%); (2) the current

available to the SWRCB for use in evaluating the evidence presented at the 1992 hearing and preparing the 1996 Draft Decision. The SWRCB's purchase of the updated model in 1999 enabled it to be used in evaluating the record for this decision.

year's October through March Yuba River unimpaired runoff (30%); and (3) the previous year's index (20%). (S-YCWA 14, p. 7.) The YRI's five water-year classifications, quantified in thousands of acre-feet (TAF) are defined as follows (S-YCWA 14, Appendix A):

Wet:	Equal to or less than 1,230 TAF
Above Normal:	Greater than 990 TAF and less than 1,230 TAF
Below Normal:	Equal to or less than 990 TAF and greater than 790 TAF
Dry:	Equal to or less than 790 TAF and greater than 630 TAF
Critical:	Equal to or less than 630 TAF

The evaluation of the instream flows established in this decision utilizes a modified version of the YRI in which an "Extreme Critical" year classification is added for water years in which the YRI is equal to or less than 540 TAF. For purposes of evaluating the effects of the alternative instream flow scenarios, the flows were modeled for a 71-year period based on the hydrologic records of the Yuba River Basin for the period of 1922 through 1992.

8.2.2 Power Generation Operational Criteria

As discussed in Section 3.3.1 above, since the mid-1980's, the operational criteria specified in the 1965 YCWA/PG&E Power Purchase Contract have been modified annually by mutual agreement of PG&E and YCWA to reduce winter energy production when storage or forecasted runoff is low, thus conserving water for power generation during the summer months when electricity is more valuable and increasing the amount of water remaining available for summer irrigation. Therefore, in evaluating the effects of alternative instream flow scenarios, ~~it was the~~ [SWRCB](#) assumed~~s~~ that the current operational criteria for power generation would continue. Those operational criteria were adopted from studies conducted by YCWA's consultants. The monthly storage levels and evaporation rates used in the Yuba River Basin Model for simulation of power generation were defined by YCWA. (S-YCWA 13, p. 33, Table 26.)

8.2.3 Demand Level

For purposes of evaluating the effects of the different instream flow alternatives, the modeling simulations [described in this decision](#) used the average annual demand level discussed in section

7.5 above. The annual demand was distributed on a monthly basis based on YCWA's monthly pattern of distribution as described in Appendix 2.

8.3 Results of Modeling Simulations

Appendix 3 contains the simulation output for the three alternative instream flow scenarios using the Yuba River Basin Model. The effects of the three instream flow alternatives on YCWA water deliveries for offstream purposes, power generation and uses of water for other purposes are discussed in Sections [8.3.1](#) through 8.4 below.

8.3.1 Effects of Different Alternatives on Water Deliveries for Offstream Uses

The estimated effects of the three instream flow alternatives on average monthly and yearly water deliveries for offstream purposes at Daguerre Point Diversion Dam for the 71-year period of record are summarized in Table 15 below:

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TABLE 15
ESTIMATED AVERAGE DELIVERIES AT DAGUERRE POINT DAM
FOR OFFSTREAM PURPOSES
COMPARATIVE SUMMARY (ACRE-FEET)

MONTH	ESTIMATED YCWA DIVERSION DEMAND ON LOWER YUBA RIVER	ESTIMATED DELIVERIES UNDER 1965 YCWA/DFG AGREEMENT	ESTIMATED DELIVERIES UNDER YCWA PROPOSED FLOW REQUIREMENTS	ESTIMATED DELIVERIES UNDER FLOW REQUIREMENTS ESTABLISHED IN THIS DECISION
January	352	352	352	344 <u>345</u>
February	352	352	352	344 <u>345</u>
March	2,648	2,648	2,648	2,586 <u>2,596</u>
April	16,242	16,242	16,242	15,865 <u>15,922</u>
May	53,088	53,088	53,088	51,854 <u>52,041</u>
June	49,001	49,001	49,001	47,862 <u>48,035</u>
July	57,541	57,541	57,541	56,204 <u>56,406</u>
August	48,304	48,304	48,304	47,181 <u>47,352</u>
September	15,815	15,815	15,815	15,447 <u>15,503</u>
October	16,727	16,727	16,727	16,338 <u>16,397</u>
November	9,191	9,191	9,191	8,977 <u>9,010</u>
December	4,586	4,586	4,586	4,479 <u>4,496</u>
TOTAL	273,847	273,847	273,847	267,483 <u>268,447</u>

As the figures in Table 15 indicate, YCWA would be able to fully meet estimated annual diversion requirements of 273,847 acre-feet per annum with no deficiencies under the existing flow requirements of the 1965 agreement or under the instream flow requirements recommended by YCWA.⁴¹ The simulated average annual deficiency under the flow requirements established in this decision would be ~~6,364~~ 5,400 acre-feet out of an estimated average annual demand for

⁴¹ As discussed previously, however, neither YCWA nor any of the fishery agencies now suggest that operation to meet the minimum flows specified in the 1965 agreement would provide adequate protection of fish. The YCWA flow recommendations would ~~unnecessarily~~ reduce instream flows from the desirable levels discussed in Sections 6.5 through 6.5.9. The effects of the YCWA flow recommendations on water available for diversion for offstream purposes were evaluated solely for purposes of comparison with the effects of the instream flow requirements established in this decision.

surface water from the lower Yuba River of 273,847 acre-feet.⁴² The numbers in Table C-5 of Appendix 3 indicate that in ~~54~~58 years of the 71-year period that was modeled, YCWA could comply with the instream flow requirements established in this decision and meet its demand for offstream uses without any deficiencies. The simulated average annual deficiencies for each of the six water year types under the modified Yuba River Index and the instream flow requirements adopted in this decision are shown in Table 16 below.

TABLE 16

**~~ESTIMATED~~SIMULATED AVERAGE ANNUAL DELIVERIES
FOR OFFSTREAM USES BY WATER YEAR TYPE**

WATER-YEAR TYPE 1922 - 1992 (number of years)	AVERAGE ANNUAL DELIVERY (AF)	AVERAGE ANNUAL DEMAND (AF)*	AVERAGE DEFICIENCY (Percent of Demand)	AVERAGE DEFICIENCY (AF)
Wet (24)	273,773 <u>273,847</u>	273,847	0.03 <u>0.00</u>	74 <u>0</u>
Above Normal (14)	271,791 <u>271,912</u>	273,847	0.75 <u>0.7</u>	2,056 <u>1,935</u>
Below Normal (15)	273,057 <u>273,283</u>	273,847	0.29 <u>0.2</u>	790 <u>564</u>
Dry (8)	258,847 <u>260,348</u>	273,847	5.48 <u>4.9</u>	15,000 <u>13,499</u>
Critical (3)	249,848 <u>249,848</u>	273,847	8.76 <u>8.8</u>	23,999
Extreme Critical (7)	242,771 <u>249,869</u>	273,847	11.35 <u>8.8</u>	31,076 <u>23,978</u>

*Section 7.9 and Appendix 2 of this decision explain the basis for using the 273,847 acre-feet as the average annual demand in all water year types.

A more detailed summary of the impacts during ~~dry, critical and extreme critical~~ each water-year type is provided in Tables 17 through ~~19~~22 below. As the numbers in the tables indicate, there are some years even in the dry, critical, and extreme critical year classifications in which no deficiencies occurred. Presumably, the difference in deficiencies among similar water year types under the YRI classification is due to variations in the hydrology ~~of each individual year~~ that are not fully accounted for by the YRI criteria.

⁴² This decision uses the term “deficiency” to refer to that portion of the estimated YCWA water demand for offstream uses that cannot be supplied with surface water from the lower Yuba River based on modeling simulations (continued next page)

[NOTE: Tables 17, 18, and 19 of the November 7, 2000 draft decision are deleted and replaced with Tables 17 through 22 below.]

TABLE 17
SIMULATED DELIVERIES FOR OFFSTREAM USES
WET WATER-YEARS

WATER YEAR	TOTAL ANNUAL DELIVERIES (AF)	TOTAL ANNUAL DEMAND (AF)	DELIVERY DEFICIENCY (Percent of Demand)	DELIVERY DEFICIENCY (AF)
1922	273,847	273,847	0	0
1927	273,847	273,847	0	0
1938	273,847	273,847	0	0
1941	273,847	273,847	0	0
1942	273,847	273,847	0	0
1943	273,847	273,847	0	0
1951	273,847	273,847	0	0
1952	273,847	273,847	0	0
1953	273,847	273,847	0	0
1956	273,847	273,847	0	0
1958	273,847	273,847	0	0
1963	273,847	273,847	0	0
1965	273,847	273,847	0	0
1967	273,847	273,847	0	0
1969	273,847	273,847	0	0
1970	273,847	273,847	0	0
1971	273,847	273,847	0	0
1974	273,847	273,847	0	0
1975	273,847	273,847	0	0
1980	273,847	273,847	0	0
1982	273,847	273,847	0	0
1983	273,847	273,847	0	0
1984	273,847	273,847	0	0
1986	273,847	273,847	0	0
Average	273,847	273,847	0	0

using YCWA's Yuba River Basin Model. As used in this decision, the term does not imply an actual physical shortage of water that is not available from other sources.

TABLE 18**SIMULATED DELIVERIES FOR OFFSTREAM USES
ABOVE-NORMAL WATER-YEARS**

WATER YEAR	TOTAL ANNUAL DELIVERIES (AF)	TOTAL ANNUAL DEMAND (AF)	DELIVERY DEFICIENCY (Percent of Demand)	DELIVERY DEFICIENCY (AF)
1923	273,847	273,847	0	0
1928	273,847	273,847	0	0
1935	273,847	273,847	0	0
1936	273,847	273,847	0	0
1937	273,847	273,847	0	0
1940	261,997	273,847	4.3	11,850
1945	273,847	273,847	0	0
1946	273,847	273,847	0	0
1948	273,847	273,847	0	0
1950	273,847	273,847	0	0
1954	273,847	273,847	0	0
1957	273,847	273,847	0	0
1973	273,847	273,847	0	0
1978	258,612	273,847	5.6	15,235
Average	271,912	273,847	0.7	1,935

TABLE 19**SIMULATED DELIVERIES FOR OFFSTREAM USES
BELOW-NORMAL WATER-YEARS**

WATER YEAR	TOTAL ANNUAL DELIVERIES (AF)	TOTAL ANNUAL DEMAND (AF)	DELIVERY DEFICIENCY (Percent of Demand)	DELIVERY DEFICIENCY (AF)
1925	268,769	273,847	1.9	5,078
1926	273,847	273,847	0	0
1930	273,154	273,847	0.6	1,693
1932	273,847	273,847	0	0
1944	273,847	273,847	0	0
1949	273,847	273,847	0	0
1960	272,154	273,847	0.6	1,693
1962	273,847	273,847	0	0
1964	273,847	273,847	0	0
1966	273,847	273,847	0	0
1968	273,847	273,847	0	0
1972	273,847	273,847	0	0
1979	273,847	273,847	0	0
1985	273,847	273,847	0	0
1989	273,847	273,847	0	0
Average	273,283	273,847	0.2	564

TABLE 20**SIMULATED DELIVERIES FOR OFFSTREAM USES
DRY WATER-YEARS**

WATER YEAR	TOTAL ANNUAL DELIVERIES (AF)	TOTAL ANNUAL DEMAND (AF)	DEFICIENCY (Percent of Demand)	DEFICIENCY (AF)
1929	261,847	273,847	4.4	12,000
1933	273,847	273,847	0	0
1939	189,850	273,847	30.7 (see note)	83,997 (see note)
1947	273,847	273,847	0	0
1955	273,847	273,847	0	0
1959	261,847	273,847	4.4	12,000
1981	273,847	273,847	0	0
1990	273,847	273,847	0	0
Average	260,348	273,847	4.9	13,499

Note: Pursuant to the "Deficiency Clause" described under Section 8.4 of this decision, any year in which the projected deficiency in offstream deliveries would exceed 20% of projected demand, the permittee may ask for a temporary modification of instream flow requirements. Under the provisions of the "Deficiency Clause" described in Section 8.4, the maximum deficiency at the present level of demand would be limited to 54,769 acre-feet, or 20% of present demand.

TABLE 21**SIMULATED DELIVERIES FOR OFFSTREAM USES
CRITICAL WATER-YEAR**

WATER YEAR	TOTAL ANNUAL DELIVERIES (AF)	TOTAL ANNUAL DEMAND (AF)	DELIVERY DEFICIENCY (Percent of Demand)	DELIVERY DEFICIENCY (AF)
1961	273,847	273,847	0	0
1987	201,850	273,847	26.3 (see note)	71,997 (see note)
1991	273,847	273,847	0	0
Average	249,848	273,847	8.8	23,999

Note: Pursuant to the "Deficiency Clause" described under Section 8.4 of this decision, any year in which the projected deficiency in offstream deliveries would exceed 20% of projected demand, the permittee may ask for a temporary modification of instream flow requirements. Under the provisions of the "Deficiency Clause" described in Section 8.4, the maximum deficiency at the present level of demand would be limited to 54,769 acre-feet, or 20% of present demand.

TABLE 22

**SIMULATED DELIVERIES FOR OFFSTREAM USES
EXTREME CRITICAL WATER-YEAR**

WATER YEAR	TOTAL ANNUAL DELIVERIES (AF)	TOTAL ANNUAL DEMAND (AF)	DELIVERY DEFICIENCY (Percent of Demand)	DELIVERY DEFICIENCY (AF)
1924	237,848	273,847	13.1	35,999
1931	273,847	273,847	0	0
1934	273,847	273,847	0	0
1976	261,847	273,847	4.4	12,000
1977	164,158	273,847	40.1 (see note)	109,689 (see note)
1988	263,690	273,847	3.7	10,157
1992	273,847	273,847	0	0
Average	249,869	273,847	8.8	23,978

Note: Pursuant to the "Deficiency Clause" described under Section 8.4 of this decision, any year in which the projected deficiency in offstream deliveries would exceed 20% of projected demand, the permittee may ask for a temporary modification of instream flow requirements. Under the provisions of the "Deficiency Clause" described in Section 8.4, the maximum deficiency at the present level of demand would be limited to 54,769 acre-feet or 20% of present demand.

The figures in Tables 15 through ~~19~~²² above show that the instream flow requirements adopted in this decision will have no impact on YCWA water deliveries in many years. [In three years of the 71-year period of record that was modeled, the flow requirements established in this decision could lead to deficiencies ranging from 26 percent to 40 percent unless a provision is made for adjusting the instream flow requirements in the few years where large deficiencies would otherwise occur. Section 8.4 below discusses the Deficiency Clause that will be operable in those years when the projected deficiency in deliveries for offstream uses would otherwise exceed 20 percent.](#)

As discussed in Section 3.1, YCWA estimates the annual groundwater recharge rate in the Yuba-South Basin to be between 15,100 acre-feet and 21,200 acre-feet depending upon variable hydrologic conditions. The estimated groundwater recharge rate substantially exceeds the average annual surface water deficiency of 6,364 acre-feet that is estimated to occur using the instream flow requirements in this decision. ~~In almost all years,~~ [In view of the Deficiency](#)

Clause discussed in Section 8.4, the impact of the flow requirements established in this decision on offstream water deliveries will always be ~~much~~ less than the additional 82,018 acre-feet of groundwater that YCWA water users pumped in ~~1994~~1991 to enable a water transfer to outside the YCWA service area. (See Section 3.1.2 above.) ~~Based on the past hydrology of the Yuba River Basin, in only one out of 71 years would YCWA face a significant deficiency in excess of the amount of additional groundwater it has pumped in order to make water available for transfer.~~ Thus, ~~with the exception of an extreme critical year following an extreme critical year (as in water year 1977),~~ the record indicates that any deficiencies in surface water supplies that may occur due to the instream flow requirements established in this decision could be offset through implementation of a groundwater conjunctive use program⁴³ ~~—In the event that available groundwater supplies are not sufficient to compensate for any deficiencies of surface water in a particular year,~~ Deficiencies in the amount of water available for offstream use could also be offset through increased water conservation measures. Despite successful water conservation measures in some instances, the record establishes that water users in the YCWA service area could adopt additional reasonable but more stringent water conservation measures.⁴⁴ In addition, YCWA's contracts provide for imposing deficiencies upon its contractors under specified conditions. The specific means of dealing with any potential deficiencies in surface water supplies from the lower Yuba River is a decision for YCWA and water users within its service area.

⁴³ In addition to the direct costs of pumping groundwater, Brophy presented testimony that maintaining standby groundwater pumping capability can result in additional annual costs of approximately \$36.25 per acre even if no groundwater is pumped. (S-Brophy 1, p. 4.) These costs would be incurred whether the standby pumping capability is maintained in order to allow groundwater pumping needed to meet demands within Yuba County or to make surface water available for use in other areas of the state as proposed by YCWA.

⁴⁴ For example, the water demand figures used in this analysis for waterfowl habitat are based on an assumed duty of water of one acre-foot per acre for 90 percent of the rice acreage in the YCWA service area, plus 10 percent for conveyance losses. Yet the testimony establishes that flooding successive rice fields sequentially would require less water and is more desirable from the standpoint of providing waterfowl habitat. (S-R.T.1313:15 -1314:22; 1320:21-1321:4.) As discussed in Section 7.3, the record also indicates that rice can be grown with less water per acre when there is an incentive to conserve as was the case when groundwater was used more widely in the YCWA service area.

8.3.2 Effects of Different Alternatives on Hydroelectric Power Production

Under the terms of YCWA/PG&E Power Purchase Contract, PG&E pays YCWA \$8 million per year for all power that is generated at YCWA facilities. (YCWA 6, p.2..) The payment is not dependent upon the amount of power produced. Consequently, any reduction in the economic value of power produced until 2016 would represent a cost to PG&E, rather than to YCWA.

In contrast to many other situations where power production is at issue, virtually all of the water released to provide instream flows in the lower Yuba River passes through the YCWA and PG&E powerplants by the time it enters the river downstream of Englebright Dam. Therefore, variations in the instream flow requirements for protection of fish in the lower Yuba River would be expected to have minimal impact on the net quantity of power produced. A change in the release schedule toward greater releases in spring months and reduced releases in July, August, and September, however, would be expected to ~~reduce~~ result in a shift in power production to different periods and a reduction in the value of the power produced. (R.T. VI, 60:16-61:4.) Adherence to the schedule specified in the Power Purchase Contract would also result in higher releases earlier in the year and reduced releases in July, August, and September.⁴⁵

The flow requirements established in this decision apply to the reach of the lower Yuba River downstream of Englebright Reservoir, and therefore, would ~~have minimal~~ not directly impact on the use of the Colgate Powerhouse as a daily peaking facility which can produce power during the periods of each day when the high demand and high economic value of the power produced is greatest. The quantity of power to be generated at Colgate Powerhouse under each of the three alternatives is shown in Appendix 4. The relatively small difference in the amount of power

⁴⁵ In recent years YCWA and PG&E have agreed to deviate from the release schedule called for in the 1966 Power Purchase Contract. The Yuba River Development Project has always been operated for multiple purposes, including fishery protection, and virtually any change in the operation of the project for any reason can affect power revenues. Releases of water from New Bullards Bar can also affect the timing of water releases by the State Water Project (SWP) and the Central Valley Project (CVP) for meeting Delta outflow requirements. (R.T. XII, 19:4-19:18.) Therefore, any power production impacts associated with changing instream flows in the lower Yuba River may be partially offset due to related changes in releases at SWP and CVP facilities. Although this point is recognized on page 16 of the letter dated November 27, 2000, submitted by PG&E, the evidentiary record is insufficient to determine the extent of the changes at other power production facilities.

generated under the alternative proposed by YCWA and the alternative based on the instream flows requirements adopted in this decision, when averaged over all water-year types, is due in part to the similarity of the different instream flow alternatives for wet and above normal years, and in part due to influence of other operational criteria.

YCWA's Yuba River Development Project historically has been operated for many purposes of which power production is one. Strict conformance with the provisions of the Power Purchase Contract would not maximize generation of power during periods of highest demand. In view of the multiple purposes for which the project was developed, the importance of the Yuba River fishery, and legal requirements for protection of that fishery where feasible, the SWRCB ordinarily would not defer requiring compliance with the new requirements due to the effects on hydroelectric power production discussed above.

However, in view of the critical electrical power situation in California at the present time, and the need to maintain flexibility in powerplant operations to avoid serious electricity shortages, we conclude that it is appropriate in this instance to defer imposition of the long-term instream flow requirements established by this decision for a period of approximately five years, until April 21, 2006.⁴⁶ In the interim, this decision requires YCWA to comply with the instream flow requirements set forth in Table 8 of this decision. The instream flows in Table 8 of this decision are the same as the flows specified in YCWA's instream flow proposal presented at the 2000 hearing. (See Section 6.5.6 above.) Operation in accordance with the lower instream flows specified in Table 8 will allow more flexibility in releasing water from power generation during months of high demand. With the exception of the lower flow numbers that apply during certain periods as specified in Table 8, the other provisions of this decision are not deferred.

⁴⁶ The SWRCB takes official notice of the fact that, on January 17, 2001, Governor Davis proclaimed a State of Emergency to exist due to the energy shortage in California. (Cal. Code Regs. tit 23, Section 648.2.) The SWRCB also takes official notice that on February 8, 2001, the Governor issued several Executive Orders to expedite application processing and construction of new powerplants and to increase electrical generating capacity in California. (Executive Orders D-22-01, D-23-01, D-24-01, D-25-01, and D-26-01.

(continued next page)

8.3.3 Effects of Revised Instream Flow Requirements on Recreation, Wildlife, Riparian Vegetation and Waterfowl Habitat

Increased minimum flow requirements in the lower Yuba River could affect recreation along the river and at New Bullards Bar and Englebright Reservoirs. Water-related recreation in the lower Yuba River area includes fishing, canoeing, rafting, snorkeling, bird watching, photography, hiking and camping. (R.T. VII, 67:6-69:5; R.T. XIV, 16:5-21:25; Cook Exhibits J-4, L-3, M-5 through M-8, and T.) In years when instream flows approach the minimum required under the 1965 agreement, interest in canoeing and rafting declines. (R.T. XII, 69:6-70:2.) There was testimony that the flows proposed by DFG will improve recreational opportunities. (R.T. XIV, 12:5-12:17 and 15:8-15:13.) The flows established in this decision are lower than proposed by DFG, but substantially higher than the flows specified in the 1965 agreement. We conclude that the increased flows established in this decision will benefit recreational use of the lower Yuba River.

In 1992, YCWA presented testimony that New Bullards Bar provides important recreational resources and recommended that studies be done to evaluate potential adverse impacts of the DFG recommendations on recreation at New Bullards Bar. (R.T. IX, 123:1-123:20.) No such studies were introduced into the record during the hearing in 2000. The evidence presented by YCWA in 1992 indicates that recreation at New Bullards Bar actually increased during ~~a recent~~ [the 1987-1992 drought](#) [as other reservoirs in the area were drawn down](#). (YCWA 19, pp. 13 and 14.) Thus, the reduction in reservoir storage levels during that period due to temporary water transfers and associated instream flow requirements does not appear to have had a significant adverse effect on recreation. The testimony of the recreation specialist presented by YCWA did not address recreation at Englebright Reservoir or the lower Yuba River. (R.T. IX, 123:17-123:20.)

Wildlife-related issues addressed in the proceeding include effects of higher flow requirements on bald eagles, riparian vegetation and waterfowl habitat. Bald eagles are known to occur at New Bullards Bar Reservoir throughout the year, and along the lower Yuba River during fall and winter. (R.T. IX, 121:19-122:10; R.T. XIV, 11:15-11:20 and 20:3-20:10.) YCWA's wildlife expert testified in 1992 that he was not aware of any problems with bald eagles at New Bullards Bar Reservoir due to water level fluctuations in recent years, and that he had no evidence to indicate the flows proposed by DFG would adversely affect bald eagles. (R.T. IX, 129:11-131:3.)

The riparian plant community adjoining the lower Yuba River can benefit wildlife and fisheries. (DFG 26, p. 101.) Since completion of New Bullards Bar, the riparian community has expanded under streamflow conditions that have generally been higher than required under the 1965 agreement. (DFG 26, p. 102-103; YCWA 20, pp. 2-9 to 3-10.) The flows established by this decision are within the recent historic range of flows and are not expected to adversely affect the riparian plant community.

There was extensive testimony about the beneficial use of water from the lower Yuba River for winter flooding of rice fields to promote rice straw decomposition and to provide waterfowl habitat. As discussed in Section 8.3.1, the instream flow requirements established in this decision will leave sufficient water available from surface and groundwater sources to meet YCWA's water demands for offstream uses, including waterfowl habitat. In some years, the water applied for waterfowl habitat may be reduced, but there is no evidence that the instream flow requirements established in this decision would prevent Yuba County water users from maintaining sufficient waterfowl habitat

8.4 Temporary Modification of Instream Flow Requirements Based on Projected Surface Water Deficiencies

As discussed in preceding sections, the record shows that YCWA will have sufficient water available to comply with the instream flow requirements established in this decision and to fully

meet reasonable demands for surface water deliveries in most years. However, computer simulations show that in 3 years of the 71-year period of record, YCWA would experience deficiencies in excess of 20 percent of its present level of demand. As the demand for water increases, deficiencies in the amount of surface water available to meet offstream demands would be expected to increase.

In view of the need for water for fishery protection and the availability of water from other sources, the SWRCB believes it is reasonable to expect YCWA to meet a significant portion of expected surface water deficiencies through conjunctive use programs, increased water conservation or other approaches. However, in the relatively few dry, critical or extreme critical years in which computer simulations indicate that large deficiencies may occur, the SWRCB believes that it is reasonable to allow for a temporary reduction in instream flow requirements in order to prevent deficiencies in the amount of water available for offstream uses from exceeding 20 percent of the projected demand for that year.

Therefore, among the amendments to YCWA's water right permits specified in this decision is a condition that allows YCWA to file a request with the Chief of the Division of Water Rights for a temporary reduction in the instream flow requirements applicable to its permits. The condition allows for filing the request in dry, critical, and extreme critical years (based on the Yuba River Index) if YCWA's projected deficiency for surface water deliveries within the YCWA service area for the calendar year exceeds 20 percent of projected demand. For purposes of the permit condition, "projected demand" for the calendar year is based upon the sum of the following:

1. Permittee's projected demand for surface water deliveries to Dry Creek Mutual Water Company (Dry Creek) for the current year, not to exceed 16,743 acre-feet;
2. Permittee's projected demand for surface water deliveries to Wheatland Water District and Wheatland Water District Detachments (Wheatland) for the current year, not to exceed 40,855 acre-feet; and
3. Permittee's projected demand for surface water deliveries for the remainder of permittee's authorized place of use within the permittee's service area

(excluding Dry Creek and Wheatland) for the current year, not to exceed 273,847 acre-feet.

In order to allow the SWRCB to evaluate the nature and extent of any projected deficiencies, the new permit condition provides that the projected demand figures must specify YCWA's surface water deliveries to each water district or other recipient that have occurred during the calendar year as of the date of the request and YCWA's projected demand for surface water deliveries for the remainder of the current calendar year. The request must include documented data on actual surface water deliveries to Dry Creek and Wheatland for the past three years (if applicable) and expected surface water demand for Dry Creek and Wheatland for the current calendar year.

The permit condition also provides that if YCWA files a request to reduce instream flow requirements, then it shall develop an alternative instream flow proposal, following notification to and consultation with DFG, that would allow for meeting up to 80 percent of YCWA's projected demand for the current year. The alternative instream flow proposal must be included with YCWA's request and must propose instream flows to remain in effect from the date of approval by the Division Chief for the remainder of the calendar year. Any request for a temporary reduction in instream flow requirements must be submitted by April 7 of the year for which the reduction is requested, in order to facilitate action by the Division Chief upon the request prior to April 21 of each year.

Following review of any request submitted by YCWA and other relevant information, the permit condition provides that the Division Chief has the authority to approve a temporary reduction in the instream flow requirements for the period of April 21 through October 31 (or a portion thereof) of the year in which the flow reduction request is submitted. The Division Chief may approve a temporary reduction of instream flow requirements, as requested by YCWA or as otherwise justified by the available information, but the condition provides that, in no event, shall the temporary instream flow requirements be approved that are less than proposed in YCWA's request or less than the instream flows specified in the table set forth in paragraph 1(c) of the first term added to YCWA's permits by the order portion of this decision.

The term also provides for notification to DFG of action upon the request for a temporary reduction of applicable instream flow requirements and provides that the Division Chief's action shall be subject to reconsideration by the SWRCB. Finally the condition includes appropriate reporting requirements regarding actual water deliveries, any curtailments in requested deliveries and instream flows at Marysville for the year during which any reduced flow requirements are in effect. This condition is included in the permit as a means of balancing the need for instream flows for protection of fish with the need for water to serve offstream uses in YCWA's service area

8.5 Summary of Effects of Revised Instream Flow Requirements

YCWA introduced substantial evidence regarding the effects of establishing the instream flow requirements proposed in the 1996 Draft Decision. The instream flow requirements established in this decision are similar to the [1996](#) Draft Decision, but are substantially lower during the spring months of extreme critical years. Much of the evidence YCWA presented regarding potential water supply deficiencies and related effects was based on excessively high estimates of YCWA's water demands. For the reasons discussed in Section 7.5 above, we conclude that a more reasonable estimate of YCWA's [present](#) demand for surface water from the lower Yuba River is 273,847 acre-feet per year. As the findings above explain, any deficiencies that may result from operating to meet the instream flow requirements established in this decision are expected to be significantly less than predicted by YCWA and any adverse effects would be reduced accordingly.

Due to the limitations in computer modeling and inevitable yearly variations in many factors, the analysis developed through use of YCWA's Yuba River Basin Model cannot be treated as a precise forecast of what will occur in any particular year. However, the record establishes that the modeling simulations provide a reasonable estimate of the probable effects of maintaining the instream flows required by this decision. In our opinion, the evidentiary record and the

foregoing analysis establish that maintaining the instream flow requirements specified in this decision is feasible⁴⁷ and will provide substantial protection and benefits for fishery resources in the lower Yuba River. In most years, YCWA will have sufficient surface water available from the lower Yuba River to meet all its reasonable offstream demands. In some years, water users will need to utilize groundwater to offset deficiencies in the surface water supply or employ additional water conservation measures to reduce water use. [The Deficiency Clause discussed in Section 8.4 will limit deficiencies to no more than 20 percent of YCWA's present level of demand.](#)

9.0 LEGAL ISSUES RELATED TO FISHERY PROTECTION MEASURES

Statutory provisions regarding protection of fishery resources are reviewed in Sections 4.0 through 4.3 above. The subject of the SWRCB's legal authority to regulate water diversions to protect fish and other public trust uses, and to ensure compliance with the reasonable use and diversion mandates of Article X, Section 2 of the California Constitution, is discussed in Sections 5.0 through 5.3 above. A number of other legal issues were raised at the hearing or in legal briefs submitted following the hearing in 1992 and in 2000. Sections 9.1 through 9.8 below address legal issues raised by parties to the proceeding that are not addressed elsewhere in this decision.

9.1 Preparation of Department of Fish and Game Fisheries Management Plan

The DFG Lower Yuba River Fisheries Management Plan (DFG 1) was prepared in response to the Streamflow Protection Standards Act enacted in 1982. (Public Resources Code § 10000 et seq.). The act directs DFG to identify streams and watercourses throughout the state for which minimum flow levels need to be established to assure the continued viability of stream-related

⁴⁷ In addition to information derived using the Yuba River Basin Model, the SWRCB believes that it is significant that throughout the 1987 to 1992 drought, YCWA was able to: (1) supply all existing demand without imposing any deficiencies as allowed for under its contracts, (2) maintain a minimum of 500,000 AF (or roughly 50 percent of capacity) in New Bullards Bar Reservoir, (3) provide 725,000 AF of water to other areas of the state, and (4) maintain instream flows in the Yuba River which were frequently much higher than the minimum flows required under the 1965 agreement and, during substantial periods of time, higher than the flows established in this decision.

fish and wildlife resources. (Public Resources Code § 10001.) In developing the requirements, DFG is directed to consult with state officials, all affected local governments, and any private individuals, groups or organizations deemed advisable. DFG is directed to transmit its proposed requirements to the SWRCB. (Public Resources Code § 10002.)

Water Code section 1257.5 provides that the SWRCB shall consider the proposed requirements when acting upon applications to appropriate water. Section 1257.5 also provides that the Board "may establish such streamflow requirements as it deems necessary to protect fish and wildlife as conditions in permits and licenses." Either on its own motion or at the request of the SWRCB, DFG "may review any streamflow requirement and may propose any revision or modification thereof." (Public Resources Code § 10003.)

YCWA alleges that DFG failed to comply with statutory requirements governing preparation of the fishery management plan because DFG failed to consult with YCWA. The record shows, however, that DFG repeatedly was in contact with YCWA with regard to specific fishery issues and development of the fishery management plan. (e.g., YCWA 38, including attached proposed "Memorandum of Understanding" SWRCB 1e, letter dated October 12, 1990, from Donn Wilson to Peter F. Bontadelli; and SWRCB 1e, letter dated March 20, 1990, from Donn Wilson to W. Don Maughan.) The fact that the two agencies were unable to reach an accord simply shows that the consultations did not lead to a mutually agreeable proposal.

The DFG recommendations are based on several years of technical study and analysis. Much of the information developed in that process is highly relevant to the issues before the SWRCB. Although the requirements established by this decision do not adopt the DFG recommendations in their entirety, the DFG Fisheries Management Plan is the most comprehensive fishery study done on the Lower Yuba River. As such, the report provides relevant evidence that was appropriately considered in developing this decision.

YCWA's post-hearing briefs argue that DFG plan does not address economic and other implications of adopting DFG's recommendations. As a result, YCWA argues, DFG failed to meet "its" burden of proof and, therefore, YCWA's permits should not be amended. This argument appears to reflect a basic misconception of the scope and nature of the proceeding. In this decision, the SWRCB is applying its own authority, not DFG's, based on evidence in the entire record, not just evidence in the DFG plan.

By the time of the resumed hearing in February 2000, if not before, there was a widespread consensus that, if the Yuba River Development Project were operated all times just to meet operation to the minimum flow requirements specified in the 1965 agreement, then there would not provide-be sufficient flows to keep fish in good condition. Moreover, YCWA's water right permits contain earlier flow requirements that both DFG and YCWA recognize were superseded by the flows in the 1965 agreement. In the absence of any meaningful instream flow requirements in the permit, the task before the SWRCB is how to exercise its ongoing authority and responsibility to protect public trust resources where feasible in accordance with applicable law.⁴⁸ Due to the number and complexity of issues involved, no single party was expected to offer evidence on all issues addressed in this decision. Numerous parties presented evidence on many issues. Taken as a whole, the extensive evidentiary record forms a solid basis for this decision.

YCWA also takes issue with the language in the Fisheries Management Plan about "optimizing" fishery habitat, arguing first that DFG has not established that its recommendations would "optimize" fishery habitat, and, second, that there is no legal basis for requiring that fishery conditions be "optimized." It is unclear from the record what DFG meant by "optimizing" habitat. Due to the variety of species and lifestages present in the lower Yuba River, DFG had to

⁴⁸ The initial hearing in 1992 was conducted in response to a complaint and in response to DFG's request to consider the recommendations in the Fisheries Management Plan. Based on the evidence in the present record regarding the importance of Yuba River fishery resources (including threatened species) and the absence of adequate conditions in YCWA's permits to protect those resources, the SWRCB would be justified in proceeding in this matter even if there were no pending complaint.

balance desirable habitat conditions of different species and lifestages to come up with proposed flows representing what it considered to be an "optimum" proposal.

The DFG plan proposes that potential water shortages in dry years be distributed between reductions in instream flows and reductions in consumptive use. This approach indicates that DFG did not intend to "optimize" fishery conditions at the expense of all other uses. In addition, we note that DFG's temperature recommendations are at the upper end of the desired temperature range for the species under consideration, which indicates that DFG considered the available water supply in developing its recommendations. The USFWS criticism of the DFG plan for not considering the potential fishery benefits of higher flow levels also indicates that the DFG plan was not based on a single purpose intent of "optimizing" fishery habitat.

Regardless of what DFG may have intended by the term "optimizing," the fishery protection measures established by the SWRCB in this decision do not represent an attempt to create some hypothetical optimal fishery habitat without consideration of other factors. Rather, the requirements of this decision take into account the evidence presented on fishery needs, competing water demands, project operations, and applicable legal requirements.

9.2 Effect of Federal Court Rulings Regarding Preemption of State Regulatory Authority Over Federally Licensed Hydropower Projects

In addition to the water right permits for irrigation, municipal use, recreation and fishery enhancement which are the subject of the present proceeding, YCWA holds separate water right licenses, and a federal power license, authorizing generation of hydropower at the Colgate Powerhouse and Narrows Powerhouse No. 2. Citing the Supreme Court ruling in the "*Rock Creek*" case (*California v. Federal Energy Regulatory Commission* (1990) 495 U.S. 490 [110 S. Ct. 2024]), YCWA filed suit in federal court arguing that the State was preempted from setting instream flow or temperature standards which differ from the requirements specified in YCWA's federal power license. YCWA requested a preliminary injunction to prevent the SWRCB from

"considering or imposing" flow or temperature standards that differ from the requirements in the power license.

In an order dated January 29, 1992, Judge Edward Garcia ruled that YCWA had little chance of success on the merits and denied YCWA's request for a preliminary injunction. Judge Garcia's ruling stressed that the water rights under consideration in the present proceeding are distinct from YCWA's water right licenses for generation of hydropower. The *Rock Creek* decision addressed state water right authority over single-purpose hydroelectric projects. It did not address the state's authority over diversion or use of water for irrigation, municipal, or other uses as part of a multiple purpose project involving hydropower production.

In the present case, the "supplemental notice of public hearing" dated October 18, 1991, specifically excluded YCWA's water right licenses for production of hydroelectric power production from consideration at the SWRCB hearing. As explained in the original hearing notice dated September 12, 1991, and the supplemental notice hearing, the focus of the proceeding, with respect to the diversion of water by YCWA, was on diversions under Water Right Permits 15026, 15027, and 15030 for irrigation, domestic, industrial, recreation, fish and wildlife, and flood control uses.

The position of YCWA and PG&E,⁴⁹ as expressed at the hearing and in post-hearing legal briefs, appears to be that the existence of a federal power license for the hydroelectric power aspects of a multiple-use project somehow shields the project operator's diversion of water for other purposes from state regulation to protect fish and wildlife. The SWRCB recognizes that under the *Rock Creek* decision, the Federal Energy Regulatory Commission (FERC) has preemptive authority to establish the instream flow requirements that apply to the use of water for power production. If YCWA proposed to divert water only for power production purposes as

⁴⁹ PG&E participated in the 1992 hearing, but did not participate in the hearing in 2000 or file a brief following the hearing.

authorized by its FERC license and by its state water right licenses for power production, then it might have a basis for arguing that the state would not have the authority to adopt water right permit conditions establishing instream flow requirements more restrictive than the federal requirements.⁵⁰

Section 27 of the Federal Power Act specifies that state authority over irrigation, municipal use, or other similar uses is not preempted. (16 U.S.C. § 821; see *Rock Creek*, 495 U.S. 490, 398 [110 S.Ct. 2024, 2029] [holding that this section preserves state authority to regulate irrigation, municipal use, and other uses of the same nature, and does not preserve state authority to regulate use for hydropower generation].) In *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 931 [91 Cal.Rptr.2d 66], the Court of Appeal held that Federal Power Act does not preempt state laws concerning environmental impacts of operation of FERC licensed multiple purpose water development projects to the extent that those laws are applied to use of the project for consumptive use purposes such as irrigation or municipal use. Thus, if a water user diverts water for irrigation or other non-power purposes, as in the present case, that diversion of water remains fully subject to regulation by the State, including appropriate conditions for protection of fish and wildlife.

Both PG&E and YCWA cite *Escondido Mutual Water Co. v. FERC* (1982) 692 F. 2d 1223, for the proposition that FERC has jurisdiction over the non-power production aspects of a multiple-purpose project for which a federal power license has been issued. The Escondido decision, however, says nothing about preemption of state law. The fact that FERC has jurisdiction over a project does not prevent the State from exercising its independent jurisdiction to regulate diversions of water for non-power production purposes.

The logical conclusion of PG&E's and YCWA's argument regarding the extent of federal preemption would be that the existence of a federal power license for any aspect of a multi-

⁵⁰ The state also may impose instream flow requirements as part of its water quality certification for FERC licensing or FERC license renewal. (*PUD No. 1 v. Washington Department of Ecology* (1994) 511 U.S. 700 [114 S.Ct. 1900].)

purpose project would shield all other aspects of the project, and all other uses of water by the project, from having to comply with any provisions of state law beyond protection of prior rights.⁵¹ As the price for the exemption from state regulation that YCWA seeks, its diversion of water for competing non-power production purposes would be subject to regulation by the federal government. The result would be a major shift in the responsibility for regulation of California's water resources away from the State and toward the federal government. We believe that, not only would such a change be contrary to law, but that a shift toward exclusive federal regulation of competing non-power production uses would be contrary to the interests of California water users.

The FERC relicensing order for PG&E's Narrows 1 Powerplant establishes instream flow requirements at Smartville in order to protect fishery habitat. Diversion of water near Daguerre Point Dam for consumptive use in the YCWA service area, however, could substantially reduce flows between Daguerre Point Dam and the confluence of the Yuba River with the Feather River. For the SWRCB to condition YCWA's water right permits for consumptive use on YCWA maintaining appropriate instream flows below Daguerre Point Dam would serve to compliment FERC's objective of providing sufficient water for instream uses. In addition, the findings and conclusions in this decision will be utilized by the SWRCB in commenting on hydropower applications before FERC and in exercising the State's water quality certification authority. (See *Jefferson County PUD v. Ecology Dept. of Washington* (1994) 511 U. S. 700 [114 S. Ct. 1900].)

⁵¹ No parties to the proceeding have suggested that the State lacks authority to protect holders of prior rights against diversions by junior appropriators.

9.3 Provisions of SWRCB Regulations Governing Release of Stored Water for Protection of Public Trust Purposes

The SWRCB's authority to modify water right permit terms to protect public trust uses of water is addressed in subdivision (a) of section 784, title 23, California Code of Regulations, as follows:

"In exercising its discretionary authority respecting applications to appropriate water, including prescribing or modifying permit terms and conditions, the board may require releases of water diverted and stored whenever such releases are determined by the board to be in the public interest or are needed to protect public trust uses of water, if such requirement is reasonable under Article X, Section 2 of the California Constitution." (Emphasis added.)

Subdivision (b) of section 784 provides that notwithstanding subdivision (a), where construction has commenced or the permittee has undertaken a substantial financial commitment for construction, the SWRCB will not require a release or bypass of water authorized to be appropriated unless the permittee agrees or unless the Board expressly reserved jurisdiction to require such bypass or release at the time of issuing the permit. Subdivision (b) goes on to state, however, that the specified restrictions on exercise of the SWRCB's authority "shall not apply to the continuing authority of the board to regulate appropriations of water so as to conform with Section 780 of this subchapter or to revoke permits"

Section 780 of title 23 of the California Code of Regulations requires that all permits issued by the SWRCB shall include a prescribed condition providing that the permit is subject to the Board's continuing authority to protect public trust uses. Permits 15026, 15027, and 15030 include a prior version of the present "continuing authority term" specified in section 780 of the regulations. The permit term [in Permits 15025, 15027, and 15030](#) provides that all rights and privileges under the permit (and any subsequent license) including method of diversion, method of use, and quantity of water diverted are subject to the continuing authority of the Board to protect public trust uses and to prevent waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion.

Mandatory releases of stored water for protection of public trust uses are subject to subdivisions (c) and (d) of section 784 which provide:

"(c) Before requiring releases of water pursuant to subsection (a) of this section over the objection of the applicant or permittee, the board will hold a hearing and make findings with respect thereto. The hearing will be limited to a consideration of (1) the basis for any recommendation of the Department of Fish and Game pursuant to Water Code Section 1243; (2) whether such releases are necessary to maintain or enhance beneficial uses or to meet water quality objectives in the relevant water quality control plan; (3) the probable effects of releases upon the applicant's proposed project; (4) evidence to assist in the preparation of dry and critical year relief provisions related to releases; and (5) any other issues which may be relevant to the appropriateness of a release requirement.

"(d) The quantity of water to be released from storage shall be reduced in dry and critical years as defined by the board on a basis determined by the board to be equitable after considering and balancing the effect of reduced quantity upon downstream conditions and upon permittee's project."

In this instance, SWRCB proceedings complied with the applicable procedural requirements of subdivision (c) above. In addition, this decision establishes lower instream flow requirements for dry and critical years based on equitable considerations and balancing of the effects on instream conditions and the other non-power purposes of permittee's project. In exercising our continuing authority over the water rights amended by this decision, the SWRCB concludes that the limitations established by this decision are reasonable and consistent with article X, section 2 of the California Constitution, consistent with the public interest, and necessary to preserve and restore uses protected by the public trust.

9.4 Compensation for Potential Loss of Revenue

YCWA's legal brief suggests that any potential loss of revenue from power generation may be compensable in money damages as a taking of YCWA's property rights. This suggestion is incorrect for several reasons. First, the argument ignores the fact that the property rights for which YCWA believes compensation may be due are the water right permits which it received from the State. The property rights represented by YCWA's water right permits are defined by the Water Code and applicable court decisions.

As discussed in Section 5.2 above, the California Supreme Court addressed the subject of modification of appropriative water rights in *National Audubon Society v. Superior Court* (1983) 33 Cal.3d 419 [658 P.2d 709, 189 Cal. Rptr. 346] cert. denied, 464 U.S. 977. The Court concluded that appropriative water rights were subject to modification in order to protect public trust uses. In addition, it has long been established that all water rights in California are subject to regulation as necessary to comply with the constitutional mandate to avoid wasteful or unreasonable uses, methods of use, or methods of diversion, and to maximize the beneficial use of water. (California Constitution, art. X, § 2; *Gin S. Chow v. City of Santa Barbara* (1933) 217 Cal. 673 [22 P.2d 5].) These limitations “inhere in the title” of the property right YCWA obtained when it accepted a permit from the SWRCB; applying these limitations cannot constitute a taking because YCWA acquired its right subject to these limitations. (See *Lucas v. South Carolina Coastal Council* (1992) 505 U.S. 1003, 1029 [112 S.Ct. 2886, 2900].)

Water Code section 1391 provides that every permit issued shall include a list of enumerated conditions and the statement that any appropriator to whom a permit is issued takes it subject to the conditions expressed in the permit. Water Code section 1392 states that every permittee who accepts a permit does so "under the condition precedent that no value whatsoever in excess of the amount paid to the State therefore shall at any time be assigned or claimed for any permit" if purchased or condemned by the State. YCWA's water right permits include conditions setting forth the provisions of sections 1391 and 1392. In addition, YCWA's permits include the standard permit condition providing that the rights under the permit are subject to the continuing authority of the Board to impose further limitations on the permit in order to protect public trust uses. (See Section 9.3 above.)

In summary, the law is clear that the property interests in the water right permits held by YCWA are defined by state law, that those property interests are subject to modification or additional regulation under state law, that YCWA's permits expressly provide that they are subject to modification for protection of public trust resources, and that the maximum compensation which

YCWA could claim if the State were to condemn or otherwise acquire all rights represented by the permits is the amount paid to the State for the permits. Compliance with the instream flow requirements of this decision is necessary to comply with section 5937 of the Fish and Game Code, a provision of law that was in effect at the time YCWA first received its water right permits.

Finally, we note that YCWA's contract with PG&E does not call for scheduling water releases to maximize revenue from power production. Anytime that YCWA changes its operations in any manner, whether for scheduling deliveries of irrigation water or some other reason, that change could have some marginal effect on power production. ~~As discussed in Section 8.3.2, the impact of this decision upon power production at YCWA facilities will be minimal.~~ Moreover, YCWA's contract with PG&E indicates that the payment YCWA receives from PG&E for power production is not dependent upon maximizing the amount, or economic value, of power produced. Rather, the contract calls for YCWA to receive a flat rate from PG&E through the year 2016. Consequently, any diminution in the value of YCWA's rights to generate hydropower that may occur as a result of this decision is speculative and is insubstantial in comparison to the value of the remaining right.⁵² Depending upon FERC's action at the time YCWA's power facilities are up for relicensing in 2016, the requirements established in this decision may have no impact whatsoever on YCWA's revenue from power production.

9.5 Impairment of Contract Provisions of State and Federal Constitutions Are Not Applicable

YCWA contends that the federal and state constitutions prohibit the SWRCB from adopting instream flow and temperature requirements that differ from the provisions of YCWA's 1965 agreement with DFG. YCWA bases this argument on provisions of the state and federal constitutions that prohibit the State from passing a law that impairs the obligation of contracts. (United States Constitution, art. I, § 10; California Constitution, art. I, § 9.) YCWA's argument

⁵² We also note that the United State Supreme Court has held that a political subdivision cannot invoke the Takings Clause as a limitation on the power of the state. (Trenton v. New Jersey (1923) 262 U.S. 182 [43 S. Ct. 534].) (continued next page)

ignores established case law that the impairment of contract clauses of the state and federal constitutions do not apply as between the State and its political subdivisions. (*Trenton v. New Jersey* (1923) 262 U.S. 182 [43 S.Ct. 534]; *Alameda County v. Janssen* (1940) 16 Cal.2d 276 [106 P.2d 11]; *State v. Marin Municipal Water District* (1941) 17 Cal.2d 699 [111 P.2d 651].)

We also note that acceptance of YCWA's impairment of contract argument would effectively eliminate any ongoing authority of the State under article X, section 2 of the California Constitution or the public trust doctrine. Water Code section 174 provides that the adjudicatory and regulatory authority of the State in the field of water resources shall be vested with the SWRCB. Water Code section 275 charges the SWRCB with the responsibility of taking all appropriate actions to prevent waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion of water. As the agency charged by the Legislature with exercising the State's authority over water resources, the SWRCB cannot be divested of its authority or obligations by virtue of an agreement between YCWA and another state agency.

9.6 Applicability of California Environmental Quality Act to Provisions of this Decision

Although fishery enhancement was one of the original purposes of the Yuba River Development Project, YCWA argues that an environmental impact report (EIR) is required before any of the proposals in the DFG Fishery Management Plan could be added as conditions to YCWA's water right permits. (YCWA's 1992 Closing Brief, p. 52.) YCWA's most recent brief argues that an EIR would be required prior to adoption of the 1996 Draft Decision because provisions of that decision would have significant adverse environmental impacts. (YCWA's 2000 Closing Brief, p. 7.) The closing brief of South Yuba and Cordua following the hearing in 2000 also argues that an EIR is required prior to adoption of a decision by the SWRCB. For the reasons discussed below, however, the instream flow requirements and other provisions of this decision are not subject to the requirements of the California Environmental Quality Act. (Public Resources Code § 21000 et seq.)

9.6.1 Ongoing Project Exemption

The 1966 Contract Between the State of California Department of Water Resources and Yuba County Water Agency For Recreation and Fish Enhancement Grants Under the Davis-Grunsky Act, and testimony presented at the hearing, establish that fishery enhancement was one of the original purposes of the Yuba River Development Project. (CSPAA Exh. AA; R.T. V, 14:12-14:15.) Water right permits were issued to YCWA in 1966, and construction of New Bullards Bar Reservoir was completed in April 1970.

In accordance with Public Resources Code section 21169 and section 15261 of title 14 of the California Code of Regulations, projects being carried out by a public agency prior to November 23, 1970 are exempt from CEQA. In *Nacimiento Regional Water Management Advisory Committee v. Monterey County Regional Agency* (1993) 15 Cal.App.4th 201 [19 Cal.Rptr.2d 1], the California Court of Appeal held that varying the amounts of water released from a reservoir in order to meet competing interests is part of an ongoing project and is therefore exempt from CEQA.

In this instance, the flows and water temperatures been present on the lower Yuba River since the construction of New Bullards Bar are dependent primarily upon hydrologic conditions and annual operational decisions based on meeting competing project objectives, including fishery needs. Fishery enhancement was one of the original project objectives, and the flow requirements specified in this decision are well within the historic range of what has existed on the lower Yuba River since 1970. Therefore, we conclude that regulating releases to the lower Yuba River to meet the instream flow requirements specified in this decision qualifies as an ongoing project that is exempt from CEQA.⁵³ Similarly, continuing to meet with the Water

⁵³ YCWA's most recent brief argues that while its operation of the Yuba River Development Project is exempt from CEQA, any requirements imposed by the SWRCB are not exempt. We believe that a more reasonable application of the ongoing project exemption looks at the action being taken, not the agency requiring the action. For purposes of CEQA, a "project" ordinarily means the activity that occurs and may affect the environment, such as construction or operation of a facility, not the governmental decisions that require or authorize that activity. [See Cal. Code Regs., tit. (continued next page)]

Temperature Advisory Committee and attempting to provide water at temperatures beneficial to fish also falls within the ongoing project exemption.

9.6.2 Categorical Exemptions for Flow Requirements

Pursuant to Public Resources Code section 21084 and section 15300 of title 14 of the California Code of Regulations, the California Resources Agency has established certain classes of projects that have been determined not to have a significant effect on the environment and which, therefore, are categorically exempt from the preparation of environmental documents under CEQA. The instream flow requirements established in this decision meet the criteria for categorical exemptions under sections 15301, 15307 and 15308 of title 14 of the California Code of Regulations.

Section 15301 provides that the "Class 1" categorical exemptions consist of "operation, repair, maintenance or minor alteration of existing public or private structures and facilities...involving negligible or no expansion of use beyond that previously existing." Among the specific activities listed as examples of Class 1 exemptions are maintenance of fish screens, wildlife habitat areas, and streamflows to protect fish and wildlife.

Section 15307 describes "Class 7" actions that are categorically exempt from CEQA as follows:

"Class 7 consists of actions taken by regulatory agencies as authorized by state law or local ordinance to assure the maintenance, restoration, or enhancement of a natural resource where the regulatory process involves procedures for protection of the environment. Examples include but are not limited to wildlife preservation activities of the State Department of Fish and Game. Construction activities are not included in this exemption."

14, § 15378, subd. (c) ["The term 'project' refers to the activity that is being approved The term 'project' does not mean each separate governmental approval."]. See also id. § 15378, subd. (d) [distinguishing situations where the project is adoption of a generally applicable regulatory plan or rule from those where the project is the activity subject to regulatory oversight or approval.] It ~~is~~ would be nonsensical to argue that YCWA is free to vary the flow releases to the lower Yuba River in a manner harmful to the fish without preparing an EIR, but that the SWRCB must prepare an EIR before it can require YCWA to maintain instream flows at a level that protects downstream fish.

Similarly, section 15308 describes "Class 8" actions that are categorically exempt as follows:

"Class 8 consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment. Construction activities and relaxation of standards allowing environmental degradation are not included in this exemption."

In summary, even in the absence of the ongoing project exemption, establishing the flow and temperature requirements specified in this decision would be categorically exempt from CEQA under sections 15301, 15307, and 15308 as set forth above.

Section 15300.2(c) of title 14 provides that a categorical exemption shall not be used where there is a reasonable possibility that an activity will have a significant effect on the environment due to unusual circumstances. Public Resources Code section 21068 defines significant effect on the environment as a substantial or potentially substantial adverse change in the environment. Meeting the requirements established in this decision will require release of considerably less water than would be required under the DFG proposal and will leave adequate water available for other uses in Yuba County.⁵⁴ The evidence also establishes that the flows established in this decision are well within the range of flows that have occurred since the construction of New Bullards Bar. In summary, there is no evidence of unusual circumstances that would result in the flow requirements established in this decision having a significant adverse effect on the environment.⁵⁵ Consequently, the categorical exemption provisions discussed above would apply.

⁵⁴ As discussed at length above, potentially significant deficiencies in the amount of water available to meet other needs referred to in evidence presented by YCWA are the result of over estimating the need for water from the lower Yuba River in the YCWA service area and failing to fully account for conjunctive use opportunities and readily available water conservation measures.

⁵⁵ For determining if an action will have a significant adverse effect on the environment for purposes of CEQA, the baseline or point of reference consists of the existing physical conditions. (14 Cal. Code of Regs. §15125(c); *Environmental Information and Planning Council v. County of El Dorado* (1982) 131 Cal.App.3d 350.)

9.6.3 Improvements to Fish Screens and Water Diversion Facilities

The extent of environmental review associated with improving fish screens and related water diversion facilities in order to reduce fish losses is dependent upon the nature of the improvements proposed in the plans to be prepared by YCWA and other parties diverting water from the lower Yuba River. The preparation of feasibility and planning studies for future actions that have not been approved or funded does not require preparation of an EIR or negative declaration, but does require consideration of environmental factors. (Cal. Code Regs. tit. 14 § 15262.)

As mentioned above, the "Class 1" categorical exemption under section 15301 of title 14 applies to maintenance of fish screens. (Cal. Code Regs. tit. 14 § 15301 (i).) In addition, "Class 2" categorical exemptions under section 15302 are defined to consist of "replacement or reconstruction of existing structures and facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced" (Cal. Code Regs. tit.14 § 15302.)

A case-by-case determination of the applicability of the categorical exemptions authorized by sections 15301 and 15302 can be made after the agencies responsible for diversion of water at the North Canal and South Canal prepare and submit their plans for improving the diversion facilities to reduce loss of fish. If the plans indicate that proposed improvements to a particular facility will require environmental documentation under CEQA, the type of environmental document and the schedule for preparing it can be established at that time. Following completion of any required environmental documents, the SWRCB will determine what specific actions should be required to reduce loss of fish at the major lower Yuba River diversion facilities. This procedure is in accordance with the process followed with regard to the stream channel restoration requirements for streams in the Mono Lake Basin. (SWRCB Decision 1631 (1994).)

9.7 Focus of SWRCB Proceeding on Water Diversions and Instream Needs in Lower Yuba River Area

The focus of the water right hearing was on instream flow needs of the lower Yuba River downstream of Englebright Dam and on various issues relating to the adequacy of water rights of parties that divert water from the lower Yuba River. As discussed below, various parties suggested that the scope of the proceeding should have been expanded to include other geographical areas and/or water users.

YCWA argued that the SWRCB should evaluate diversions by water users located upstream of New Bullards Bar Reservoir (e.g., Nevada Irrigation District, Oroville Wyandotte Irrigation District, and Pacific Gas and Electric Company) and the potential obligations of those water users to bypass flow to protect fish in the lower Yuba River. YCWA also argued that the SWRCB has to consider the beneficial effects of out-of-basin water transfers before determining the in-basin instream flow needs of the lower Yuba River.

CSPA and Walter Cook argued that the SWRCB should consider the benefits to public trust uses within the stretch of the Yuba River between New Bullards Bar Reservoir and Englebright Dam. CSPA also argued that the SWRCB should consider the benefits to public trust uses within the Bay/Delta system that would result from higher instream flows in the lower Yuba River.

As discussed below, there are several reasons for focusing on instream flow needs of the lower Yuba River and water diversions by YCWA and others along the lower Yuba River rather than addressing upstream water diversions, speculating as to future out-of-basin demands for Yuba River water, or attempting to define the responsibility of Yuba River toward Delta outflow needs in the context of this proceeding.

Consideration of Additional In-Basin Factors: The main reason for focusing on the lower Yuba River is that the DFG Fisheries Management Plan presents technical data and recommendations for protection of fishery resources of the lower Yuba River. The plan did not evaluate the fishery

needs of the Yuba River between New Bullards Bar Reservoir and Englebright Lake. Although evidence was presented that the flow in that stretch of the river has been extremely low, the record is insufficient to evaluate the instream flow needs of that portion of the river.

The fact that there are ~~a number of water users diverting water~~ diversions from upper reaches of the Yuba River under earlier priority rights does not prevent the SWRCB from determining appropriate conditions to be included in YCWA's water right permits for protection of public trust resources in the lower Yuba River. The SWRCB was not required to conduct a statutory adjudication of all rights within the watershed when it initially established the instream flow requirements in YCWA's permits, nor is it required to adjudicate all water rights within the basin in order to revise those requirements. In the case of those projects that divert water from the upper Yuba River solely for production of hydropower under a license from FERC, the SWRCB's jurisdiction to independently establish instream flow requirements as a condition of a water right permit has been preempted by federal law.

New Bullards Bar Reservoir has a capacity of nearly one million acre-feet which is substantially larger than the combined storage of all the upstream reservoirs. The storage and release of water from New Bullards Bar Reservoir for consumptive uses significantly modifies the streamflow of the lower Yuba River. In addition, fishery enhancement was one of the original purposes of the Yuba River Development Project. Consequently, it is reasonable for the SWRCB to determine appropriate instream flow and temperature conditions to be included in YCWA's water right permits without attempting to adjudicate all prior rights of senior upstream appropriators.

Consideration of Out-Of-Basin Needs and Delta Outflow Requirements: There was considerable evidence presented that water from the Yuba River has been put to beneficial use in other regions of the state with large economic benefits. For example, Dr. Timothy Quinn of Metropolitan Water District of Southern California urged that the SWRCB consider competing uses of water in developing a management plan for the lower Yuba River fisheries, including beneficial uses in Southern California and other areas that receive water by transfer. (R.T. IV, 155:14-155:21.)

Dr. Quinn's written testimony states that an acre-foot of water in an urban area "supports more than \$300,000 in economic activities in some industries in contrast to the \$150 to \$400 output produced per acre-foot of water used for irrigation in the Central Valley." Dr. Quinn's written testimony also states that the unreliability of water supplies have forced some water sensitive industries to implement water conservation measures that cost from \$5,000 to \$10,000 per acre foot of water saved. (YCWA 24, p. 3.)

Similar testimony on the benefits which water from the Yuba River has had in other areas of the state was presented by George Baumli, General Manager of the State Water Contractors (YCWA 22, p. 4); Thomas Clark, General Manager of the Kern County Water Agency (YCWA, 28, p. 1); Frank Cotton, Supervising Engineer for the Santa Clara Valley Water District (YCWA, 30, p. 6); and John Lindblad, Public Works Director of the City of Napa. (YCWA, 32, p. 7.) In addition, water transfers to DWR have provided water to the State Water Bank, enhanced Delta outflow and provided protection of public trust uses in other areas. (YCWA 29.) None of the witnesses from agencies receiving Yuba River water via transfers from YCWA, however, had reviewed the flow releases proposed in the DFG Fisheries Management Plan. (R.T. IV, 162:8-165:11.) Without having reviewed the DFG report, the various agencies who have received water via transfers from YCWA were not in a position to comment on the merits of the DFG recommendations with respect to protection of fisheries or with respect to the effect of those recommendations on the availability of water to their agencies.

By the same token, the evidence was insufficient to evaluate the potential benefits of Yuba River flows on the Bay-Delta estuary. The DFG Fisheries Management Plan focuses on the fishery needs of the lower Yuba River rather than fishery requirements in the Delta. The SWRCB's Bay-Delta proceedings provide the appropriate forum to address the contribution of water from the Yuba River toward protecting public trust resources in the Delta.

Determining the effect of increased flow requirements in the lower Yuba River on the availability of water for uses outside the Yuba River Basin would be a complex undertaking

involving consideration of SWP and CVP operation, water demand by SWP and CVP customers and others, the availability of water from other sources, and numerous other factors which vary considerably with time. The only significant amount of water from the Yuba River Basin that would definitely not be available for beneficial use by other water users is the water that is consumptively used within Yuba County or the water that flows through the Delta during periods of water surplus.

In summary, the focus of this proceeding has been on evaluation of the in-basin needs of water for fishery protection in the lower Yuba River in view of the competing demands for water for other purposes within Yuba County. Evaluation of future out-of-basin demands for Yuba River water, whether for transfer to other water users (as urged by YCWA) or for Delta outflow (as urged by CSPA), would be very speculative and beyond the scope of the present hearing record. Future water transfer proposals can be brought before the SWRCB in accordance with applicable statutory procedures. The question of Delta outflow and revised water quality standards for the Bay-Delta estuaries is the subject of separate proceedings. It was appropriate for the present proceeding to focus on the in-basin demands for water in the lower Yuba River area.

9.8 The SWRCB Proceedings Have Provided Due Process to All Parties

The brief filed by South Yuba and Cordua following the hearing in 2000 argues that, in view of the change in the hearing officer and membership of the SWRCB between the initial hearing and the most recent hearing, due process requires an entirely new hearing following completion of an EIR on the DFG Fisheries Management Plan.⁵⁶ Although this decision is based on evidence presented by DFG and other parties, the decision does not adopt the flow or temperature recommendations in the DFG plan or many other recommendations in the plan. The applicability of CEQA to the provisions of this decision is addressed in Sections 9.6 through 9.6.3 above.

⁵⁶ Counsel for South Yuba and Cordua raised a similar objection prior to the start of the hearing in February of 2000. (S-R.T. 46:9-50:6.)

Most of the 1992 hearing was presided over by former SWRCB Chairman Don Maughan who left the SWRCB due to health considerations prior to adoption of a decision. In cases where the original hearing officer is no longer available, due process does not require disregarding a previously complied hearing record. (*Keith v. San Bernardino County Retirement Board* (1990) 222 Cal. App. 3d 411 [271 Cal. Rptr. 649].) Due to changes in conditions since 1992, the SWRCB held a subsequent hearing that involved 13 additional hearing days. The transcripts and exhibits from the first hearing were incorporated into the record of the second hearing. Prior to completion and distribution of a proposed decision following the hearing in 2000, SWRCB staff consulted with the Hearing Officer repeatedly and the SWRCB met in closed session on two occasions with the hearing staff to deliberate on a proposed decision as authorized by Government Code section 11126(c)(3). Following the closed session deliberations, the SWRCB distributed a proposed decision to all parties to the proceeding and provided an opportunity for oral and written comment on the proposed decision prior to adoption of a final decision.

Water Code section 183 provides in relevant part:

“Any hearing or investigation by the Board may be conducted by any member upon authorization of the board, and he shall have the powers granted to the board by this section, but any final action shall be taken by a majority of all members of the board at a meeting duly called and held.” (Emphasis added.)

In this instance, as in most other instances, water right hearings before the SWRCB have been held before a single hearing officer, with other Board Members attending as their schedules allow. The record shows that parties to the hearing were provided a full opportunity to present evidence, cross-examine other parties’ witnesses and present rebuttal evidence. Although the hearing notice directed parties to focus on “new information” not available in 1992, a review of the transcript shows that the Hearing Officer allowed the parties considerable latitude in presenting information they considered to be relevant.⁵⁷ The entire Board has had ample

⁵⁷ For example, the record shows that, near the end of a lengthy hearing, counsel for South Yuba and Cordua was allowed to personally testify as a rebuttal witness regarding physical conditions in 1982, prior to construction of the South Yuba/Brophy Canal, even though it was unclear what evidence in the record he was attempting to rebut. (S-R.T. 3097:14-3013:15.) Other parties were also allowed considerable latitude in presentation of their cases.

opportunity to review the record and deliberate prior to adoption of this decision in accordance with applicable statutory procedures.

10.0 ISSUES RAISED CONCERNING BASIS AND EXTENT OF WATER RIGHTS HELD BY VARIOUS DIVERTERS

The hearing notice listed a number of issues regarding the basis of water rights held by various diverters and restrictions which apply to the exercise of those rights. These subjects are addressed in Sections 10.1 through 10.9 below.

10.1 Diligence in the Development and Use of Water by YCWA

One of the issues listed in the hearing notice was whether YCWA had demonstrated diligence in developing and using water in accordance with the conditions contained in Permits 15026, 15027, and 15030. The three permits contain conditions requiring that: (1) construction work begin before June 1, 1967, (2) construction work be completed by December 1, 1973, and (3) application of water to the proposed uses be completed by December 1, 2010.

Water Code section 1395 requires that construction work and utilization of water for beneficial purposes shall be prosecuted with due diligence in accordance with applicable statutes, regulations and the terms of the permit. Section 841 of title 23 of the California Code of Regulations provides:

"In determining the period of time to be allowed to build diversion works and apply the water to full beneficial use, the particular conditions surrounding each case will govern. In every case the matter must be pressed with due diligence considering the size of the project and the obstacles to be overcome."

Section 842 of title 23 allows the SWRCB to grant time extensions to complete construction or apply water to full beneficial use. Construction of New Bullards Bar dam was initiated in June 1966 and completed in April 1970. For a variety of reasons, substantial revisions have been made to the diversion canals and other facilities from what was originally proposed. (YCWA 2,

p. 13.) YCWA presented testimony relating to the on-going development of the project and the schedule for construction of major diversion canals. (YCWA 13, pp. 8 and 9.)

The record shows that YCWA has complied with the time schedule relating to construction of New Bullards Bar Reservoir which is the major component of the Yuba River Development Project. In view of the fact that YCWA is not required to complete application of water to beneficial use until the year 2010, the requirement to complete construction prior to December 1, 1973 should not be construed to apply to all proposed diversion and distribution facilities. We conclude that YCWA's actions to date comply with the statutory requirement of reasonable diligence in the developing the project authorized by its permits.

10.2 Amendments in Points of Diversion and Rediversion Specified in YCWA Water Right Permits

Permits 15026, 15027 and 15030 originally specified a number of points of diversion and rediversion. In 1973, the SWRCB entered an order allowing changes in points of diversion and rediversion, purpose of use, and the total quantity of water diverted under YCWA's consumptive use permits. Points of diversion previously identified as the New Colgate Diversion Dam and the Irrigation Diversion Weir were replaced with the proposed Marysville Afterbay Dam which was designated as a new point of diversion and rediversion. The location of the Marysville Afterbay Dam was specified as being on the Yuba River "within the SW¹/₄ of the SW¹/₄ of Section 29, T16N, R5E, MDB&M (precise location to be determined at the time of construction)."

In 1988, the SWRCB approved addition of a new point of rediversion specified as: "The Pumpline Diversion Facility located south 1,800 feet and west 1,300 feet from the NE corner of Section 29, T16N, R5E, MDB&M being within the SE¹/₄ of the NE¹/₄ of Section 29." The order adding the Pumpline Diversion Facility as a point of rediversion to YCWA's permits provided that YCWA shall not divert water from that facility until it has installed fish screening devices satisfactory to DFG.

At present, YCWA's authorized points of diversion and rediversion on the lower Yuba River under its consumptive use permits are: (1) the location specified for the proposed Marysville Afterbay Dam, and (2) the location specified for the Pumpline Diversion Facility. Although the Marysville Afterbay Dam has not been built, the existing Daguerre Point Dam is located within the authorized location for that facility. The axis of the Daguerre Point Dam is defined by California Co-ordinates N56054, E215846. (YCWA 2, p. 22.)

A point of diversion or rediversion is identified as the structure or device that controls the diversion of water out of the natural channel. Points of original diversion may also be points of rediversion. In the case of a pump in the stream channel, the pump structure would be identified as the point of diversion. The Browns Valley diversion structure meets this criterion and is an identified point of diversion/rediversion in YCWA's permits. Water users in the Dantoni area below Daguerre Point Dam divert water supplied under contract with YCWA, but their points of diversion or rediversion have not been identified in YCWA's permits.

In the case of a dam that creates a backwater area that is used to divert water, the dam constitutes the control structure and the midpoint of the dam, where it crosses the stream, is identified as the point of diversion or rediversion. Diversions to the North and South Canals are controlled by Daguerre Point Dam, which would be considered as the point of diversion or rediversion for these canals. Daguerre Point Dam exists at substantially the same location that the proposed Marysville Dam was to have been constructed. Therefore, although not precisely defined when the permit was issued, the location of the present point of diversion has not changed significantly from the original planned location. A broadly defined point of diversion, that encompasses Daguerre Point Dam, is identified in YCWA's permits.

YCWA delivers contract water to Brophy and South Yuba via the South Canal located near the south abutment of Daguerre Point Dam. Water is diverted from the Yuba River through a rock barrier fish screen. A gated control structure and pipeline, ~~equipped with a meter~~, are located

behind the fish screen. These facilities convey the water through ~~the flood control levee~~ [an embankment](#) into the Yuba Goldfield property. Water emerging from the pipeline runs through a series of interconnected dredger ponds and channels to the south edge of the Goldfield property. Additional flow accrues to the channel as it crosses the porous dredger material of the Goldfield property. The flow in the canal is measured ~~again~~ at [gage located one mile down the canal from the Meadow Pond](#) at the southern edge of the Goldfields. At ~~Meadow Pond~~ [this gage](#), a control structure and continuous recording device measure the quantity of water taken into the South Canal ~~for use by Brophy and South Yuba. The point of measurement at Meadow Pond is influenced by the backwater of Daguerre Point Dam.~~

Daguerre Point Dam causes the lower Yuba River to surcharge the porous dredger material of the Goldfields adjacent to the dam and to flow into the South Canal. Therefore, Daguerre Point Dam is considered the point of diversion and rediversion and the ~~measuring facility~~ at Meadow Pond is regarded as the headworks for the taking of water.

~~The South Canal uses extensive portions of the existing natural channel of Reeds Creek to transport the water to Brophy and South Yuba. (Brophy 4, Appendix B.)~~ Water is diverted [Brophy Water District diverts water](#) from the South Canal ~~into (Reeds Creek)~~ [for subsequent rediversion](#) into several lateral canals in the Brophy service area. Water destined for South Yuba continues ~~downstream in Reeds Creek. Again, several lateral canals divert water from down~~ the South Canal [from which it is diverted \(Reeds Creek\)](#) at various locations to the serve South Yuba's [customers](#).

~~YCWA testified that it recently purchased the South Canal that is used to deliver contract water to Brophy and South Yuba. The South Canal was created by straightening and enlarging the natural channel known as Reeds Creek. The districts each have several lateral canals that connect to the South Canal (Reeds Creek) and allow diversion of the contract water into their supply systems. The control structures at the entrances to the districts' supply laterals are points~~

~~of rediversion for contract water provided by YCWA under Permits 15026, 15027, and 15030 and should be designated as such. These points of rediversion are not listed in YCWA's permits.~~

In summary, the evidence indicates that changes in points of diversion and rediversion are required for diversion of water to offstream uses supplied by YCWA. YCWA's Permits 15026, 15027 and 15030 (Applications 5632, 15204 and 15574) should be amended to more accurately describe Daguerre Point Dam as an authorized point of diversion and rediversion. The description of the point of diversion/rediversion located on the lower Yuba River within the SW¹/₄ of the SW¹/₄ of Section 29, T16N, R5E, MDB&M should be administratively corrected to read as follows:

"Daguerre Point Dam, located within the SW¹/₄ of the SW¹/₄ of Section 29, T16N, R5E, MDB&M and having the following California Co-ordinates N56054, E2157846."

In addition, YCWA should be directed to file petitions with the SWRCB to add points of diversion/rediversion to its permits to authorize the diversion of water from the lower Yuba River to serve diverters in the Dantoni area ~~and the rediversion of Yuba River water transported via Reeds Creek to supply Brophy Water District and South Yuba Water District.~~

10.3 Water Rights Held by Browns Valley Irrigation District

Browns Valley Irrigation District (Browns Valley) is located on the north side of the Yuba River. The district encompasses an area up to the Butte County line, extending from near Daguerre Point on the west to Smartville on the east. Browns Valley claims a pre-1914 appropriative water right to divert up to 47.2 cfs from the North Fork Yuba River based on a March 21, 1890, filing of a notice of appropriation.

Because the pre-1914 right was not perfected prior to the effective date of the Water Commission Act of 1913, Browns Valley applied to the State Water Commission for a certificate recognizing its pre-1914 appropriative right. Certificate No. 8 "Certificate Prescribing Time for Complete Application of Water to Proposed Use" under Application 12-1986 was issued to Browns Valley by the State Water Commission on April 14, 1921. (Browns Valley 2, p. 1.) The

certificate established October 1921 as the date by which water appropriated for agricultural use under the pre-1914 claim must be applied to a beneficial use. Browns Valley later requested time extensions to fully place water to beneficial use. Full beneficial use was acknowledged by the State Water Commission by letter dated April 1, 1929. (Staff 1, App. 12-1986.)

The water use claimed by Browns Valley under the pre-1914 right is for agricultural use. No season of diversion is specified in the certificate. Browns Valley presented testimony that water has been used on a year-round basis. (R.T. IX, 16:8-16:22.) As summarized in Table XI-3 of the staff analysis, Division of Water Right records on Application 12-1986 for 1907 to 1921 indicate that some water was used on a year-round basis, but that less water was used from November through March of each year. In addition, Browns Valley submitted information by letter dated March 26, 1929 to document complete development of its pre-1914 right. The information submitted shows diversions only for the months of April through October. (Staff 1, App. 12-1986, Letter dated March 26, 1929.)

Based on the quantity of water [reportedly](#) diverted during the period of time that Browns Valley confirmed beneficial use under Application 12-1986, Browns Valley's pre-1914 water rights for diversion of water from the North Fork Yuba River and the Yuba River would be no greater than shown in Table 230 below:

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TABLE 23

**BROWNS VALLEY MAXIMUM AVERAGE MONTHLY DIVERSIONS
UNDER CLAIM OF PRE-1914 WATER RIGHT**

Period	Amount		Year of Maximum Diversion
	(cfs)	(AF)	
January	10.0	614	1926
February	7.3	419	1920
March	9.0	552	1926
April – October	47.2	20,000	1928
November	35.0	2,079	1924
December	13.0	798	1926
TOTAL		24,462	

Following completion of New Bullards Bar in 1970, the headworks of Browns Valley Canal was inundated by the reservoir and Browns Valley needed to relocate its point of diversion. About 5,500 acre-feet of water were diverted directly from the Colgate Powerhouse Penstock and provided to the Browns Valley service area through the upper portion of the Browns Valley Canal. (Browns Valley 2, p. 2.) Browns Valley also developed the Pumpline Diversion Facility on the lower Yuba River about 0.9 mile upstream of Daguerre Point Dam to provide water to the lower portion of the Browns Valley service area. The facility has the capacity to pump up to 80.2 cfs from the Yuba River into the Pumpline Canal serving the lower portion of the Browns Valley service area. Water Code section 1706 allows the holder of a pre-1914 appropriative right to change the point of diversion if others are not injured by such change, but does not authorize changes in the amount of water diverted or the season of diversion.

Prior to 1987, a continuous record of flows diverted into the Browns Valley Canal was not maintained. (R.T. IX, 5:7-6:20 and 7:23-8:5.) Records submitted by Browns Valley at the hearing in 1992 indicate that, in recent years, Browns Valley had not exceeded the ~~limits of its pre-1914 right in recent years~~ rates of diversion in Table 23 above except for the month of July 1990, when the average diversion rate for the month was 47.95 cfs.

Browns Valley does not hold any post-1914 appropriative water rights on the Yuba River. In addition to the pre-1914 right described above, however, Browns Valley has a contractual right to receive up to 9,500 acre-feet of YCWA water under terms of an amended contract signed with YCWA on June 4, 1992. The contract provides that the monthly rate of supply and the annual quantity of water may be adjusted upon the mutual consent of both parties. As of the time of the hearing, Browns Valley had not requested YCWA to provide contract waters. Any diversion of water in excess of the rate and quantity authorized under Browns Valley's pre-1914 appropriative right should be covered by a water supply contract with YCWA.

Although Browns Valley filed a Statement of Water Diversion and Use on December 12, 1998, the statement does not provide all the information required under Water Code section 5103. In order to maintain proper documentation ~~substantiating continued~~ regarding the exercise of Browns Valley's pre-1914 right, ~~Browns Valley should file a Statement of Water Diversion and Use pursuant to Water Code Section 5100 et seq. together with supporting documentation.~~ Browns Valley should ~~also~~ maintain a continuous record of its water diversions and provide complete monthly and annual water diversion information on all future Supplemental Statements of Water Diversion and Use. ~~In order to provide accurate information on~~ The Supplemental Statements of Water Diversion and Use should identify diversions under its pre-1914 appropriative right and diversions under its contract with YCWA, ~~Browns Valley should maintain a continuous record of its water diversions.~~⁵⁸

10.4 Diversion of Water by Brophy Water District and South Yuba Water District

Brophy Water District (Brophy) and South Yuba Water District (South Yuba) are located south of the Yuba River. Prior to completion of a surface water conveyance and delivery system in 1985, groundwater was the only source of water for Brophy and South Yuba. (Brophy 1, p. 1; South Yuba 24, p. 1/19.) All water from the lower Yuba River that presently is used by Brophy and South Yuba is delivered through the South Canal under contract with YCWA. Brophy's

⁵⁸ SWRCB Decision 1600 held that the right to use a large quantity of water carries with it the responsibility to account for its use accurately. (SWRCB Decision 1600, p. 37.)

contract with YCWA provides for a total allocation of 75,647 acre-feet composed of a "base allocation" and a "supplemental allocation." (S-YCWA 15, Appendix A.) South Yuba's contract with YCWA provides a total allocation (base and supplemental) of 43,330 acre-feet. (S-YCWA 15, Appendix A.)

In addition to receiving water diverted under YCWA's rights, Brophy and South Yuba were also co-applicants on petitions for assignment of Water Right Applications 5632A and 20714 which were initiated under the "state filing" provisions of Water Code section 10500 et seq. The petitions for assignment were withdrawn on February 28, 1994. At present, Brophy's and South Yuba's only rights to divert water from the lower Yuba River are pursuant to their contracts with YCWA and subject to the conditions of YCWA's permits.

Reeds Creek is a seasonal stream that runs southwesterly through Brophy and South Yuba. ~~The South Canal was developed using portions of Reeds Creek to transport water diverted from the Yuba River.~~ During periods when seasonal runoff is present in Reeds Creek, ~~South Yuba and~~ Brophy may also be diverting the natural flow of Reeds Creek into the lateral canals of their distribution system. Brophy introduced evidence that water use on the parcels of property riparian to Reeds Creek is sufficient to account for any natural flow from Reeds Creek that is diverted for irrigation. (S-~~Browns Valley~~Brophy 2 and 3.)

10.5 Water Rights Held By Cordua Irrigation District

Cordua Irrigation District (Cordua) is located on the north side of the lower Yuba River, west of Daguerre Point and Browns Valley. Cordua diverts water from the north side of the Yuba River near the Daguerre Point Dam. The water is diverted through a headworks into the North Canal shared by Cordua, Hallwood, and Ramirez.

Cordua claims a pre-1914 appropriative water right for diversion from the lower Yuba River based on a 1909 filing for 10,000 miners inches of water under four inches of pressure (200 cfs) for irrigation, domestic use, and power generation. Cordua claims a second pre-1914 right based

on the 1874 filing of James P. Stall for 2,500 inches of water under four inches of pressure (50 cfs) for irrigation, stockwatering, and “various other uses.” Information from Application 9927 indicates that the pre-1914 water rights were not developed beyond the 75 cfs capacity of a 4,000-foot flume. Following issuance of permits on Applications 9927 and 12371, the 4,000-foot flume section was replaced and approximately seven miles of the canal system was widened.

Upon completion, the Cordua Canal became capable of transporting 200 cfs of water with one foot of freeboard on the canal. (Staff 1h, Application 9927, Memoranda to file dated January 15, 1941 and July 21, 1952.)

In addition to its pre-1914 rights, Cordua holds Water Right Licenses 3984 and 3985 (Applications 9927 and 12371), which allow for the direct diversion of 40 cfs and 50 cfs, respectively. Both licenses allow diversion from April 1 to November 1 for irrigation and from January 1 through December 31 for domestic use. The authorized place of use is described as 6,935 acres within a gross area of 7,464 acres. (Staff 1h, Applications 9927 and 12371.) The combination of Cordua's pre-1914 rights and its post-1914 licensed rights results in a total diversion right of 165 cfs. It is reasonable to conclude that the diversion season for irrigation under the pre-1914 rights is the same as the April 1 through November 1 season authorized under Cordua's licenses.

Cordua's pre-1914 rights and licensed rights all identify domestic use as a basis for diversion throughout the year. (Cordua 19A, 19A-1; Water Right Licenses 3984 and 3985.) However, Cordua's Report of Licensee for the years 1958 to present state that "water is used for irrigating crops only, although we do provide water for duck ponds during each duck season." The information from Cordua's Reports of Licensee indicates that Cordua's year-round right to divert for domestic purposes has been lost through more than five years non-use. (Water Code section 1241.)

Cordua presented written testimony that water is being diverted to flood rice land for wildlife habitat "utilizing its pre-1914 rights conducted under Water Code section 1706 as a changed season and propose of use which is made without harm to any party and utilizing Agency [YCWA] rights from the Yuba River Development Project." (Cordua 19, p. 3.) The first documentation of using water for wildlife habitat, however, is found in Cordua's 1949 Progress Report by Permittee under Application 9927 which states: "We have now started to serve water for duck ponds for the coming duck season." (Emphasis added.) Water for duck pond filling is indicated on all subsequent reports submitted to the SWRCB.

Water Code section 1706 allows for persons holding pre-1914 appropriative rights to change the point of diversion, place of use, or purpose of use if others are not injured by the change, but the statute does not authorize increases in the amount of water diverted or changes in the season of diversion. In this instance, Cordua did not start diverting water for duck pond use until 1949 or about 35 years after enactment of the Water Commission Act of 1914. Therefore, Cordua's diversion of water for duck ponds in the fall must be undertaken pursuant to a post-1914 appropriative right or its water supply contract with YCWA.

If diversion of water for duck pond use occurs outside of the season of diversion authorized in Cordua's licenses, then it must be undertaken pursuant to Cordua's contract with YCWA. Cordua presented written testimony that its contract with YCWA was amended recently to allow water not utilized in any month to be carried forward to a subsequent month in the same water year. (Cordua 19, p. 2.) However, a copy of the contract was not offered into evidence.

The authorized place of use under Licenses 3984 and 3985 is defined as 6,935 acres within a gross area of 7,464 acres. (Staff 1h, Applications 9927 and 12371.) Cordua presented written testimony that it now serves approximately 10,000 acres and the 1989 Report of Licensee states that 13,389 acres were served in 1987. (Cordua 19, p. 1; Staff 1h, Application 9927, 1989 Report of Licensee.) The water diverted by Cordua under its pre-1914 rights, post-1914 rights and contract rights is commingled in the diversion system and served throughout the district.

Therefore, Cordua should file a petition to amend its place of use to accurately describe its full existing service area.

Cordua has installed a gage and maintains a continuous record of the flows diverted from the Yuba River at Daguerre Point Dam. Cordua also maintains a Parshall flume in the Cordua Canal to measure the percentages of the diverted flow going to Cordua and Ramirez. Water is ordered from YCWA 24 hours in advance. (Cordua 19, p. 3.) Despite the ability to gage and record the quantity of water going to each district, Cordua's Reports of Licensee submitted to the SWRCB since 1954 have not identified the monthly or annual quantities of water diverted from the river. In order to provide accurate and complete information on water diversions and use, Cordua should continue to maintain a continuous record of water diversions. The record should be available to the SWRCB and to other interested parties upon request of the SWRCB. In addition, all future Reports of Licensee should include monthly and annual water diversion information.

In order to document and provide an ongoing record of diversions under its pre-1914 rights, Cordua should file a Statement of Water Diversion and Use in accordance with Water Code section 5100 et seq, together with appropriate documentation to substantiate any claimed pre-1914 diversion rights from the Yuba River. Information on monthly and annual water diversions relevant to Cordua's claim of pre-1914 right should be provided on all future triennial Supplemental Statements of Water Diversion and Use.

10.6 Water Rights Held By Hallwood Irrigation Company

Hallwood Irrigation Company (Hallwood) holds Water Right License 4443 (Application 9899) which allows direct diversion of 100 cfs from the north side of the Yuba River at Daguerre Point Dam from April 1 to November 1 of each year for irrigation of 7,400 acres within a gross area of 8,000 acres. (Staff 1g, License 4443.) Water Right Application 9899 also makes reference to a claim of "old rights" to divert 150 cfs, but neither a season of diversion nor a purpose of use is specified. (Staff 1g, Application 9899.)

In 1980, Hallwood signed a contract with YCWA that refers to diversion of up to 275 cfs by Hallwood, up to a maximum amount of 78,000 acre-feet per year. In addition to providing for diversion by Hallwood of water covered by YCWA's rights, the contract refers to diversion of 100 cfs under License 4443 and 175 cfs under Hallwood's claim of a pre-1914 water right. The 175 cfs which the contract refers to as covered by a pre-1914 water right exceeds Hallwood's previous claim of "old rights" to divert 150 cfs. The season of diversion for water covered by the contract is April through October. There is nothing in the contract or elsewhere in the record indicating that water that is not utilized in any month may be diverted in a subsequent month. (Staff 1g, Contract between YCWA and Hallwood dated December 30, 1980.)

Hallwood's claim of "old rights" appears to refer to a claim of pre-1914 appropriative rights, but a Statement of Water Diversion and Use has not been filed to substantiate Hallwood's claim. The record indicates that any pre-1914 rights which Hallwood may be able to establish would be for no more than diversion of 150 cfs based on a filing of 7,000 miners inches of water by F. D. Groh and Byron Jakes in 1909. In the absence of documentation to substantiate a different season of diversion, it is reasonable to assume that the season of diversion under any pre-1914 rights held by Hallwood would be the same as the April 1 through November 1 season of diversion specified in Hallwood's licensed right.

In order to properly document and report water diversions under License 4443, Hallwood's claim of pre-1914 right, and Hallwood's contractual rights with YCWA, Hallwood should maintain a continuous record of water diversions which should be made available to the SWRCB and to other parties upon request of the SWRCB. Hallwood should provide complete information on monthly and annual water diversions under License 4443 in all future triennial Reports of Licensee.

In accordance with Water Code section 5100 et seq., Hallwood should file a Statement of Water Diversion and Use together with appropriate documentation to substantiate its claim to a pre-1914 right to divert from the Yuba River. Hallwood should also provide complete information

on monthly and annual water diversions under its claim of a pre-1914 right on all future triennial Supplemental Statements of Water Diversion and Use.

Hallwood's diversions of water from the Yuba River from April 1 through November 1 should be limited to the diversion season specified in License 4443 and in its 1980 water supply contract with YCWA. Diversion of water during other months would require acquisition of additional water rights or amendment of Hallwood's contract with YCWA.

10.7 Diversion of Water By Ramirez Water District

The Ramirez Water District (Ramirez) is located north of Cordua bordering Butte County. Ramirez diverts water from the lower Yuba River into the North Canal shared with Cordua and Hallwood. Ramirez holds no water rights of its own but purchases water from YCWA under contract. The contract allows Ramirez to purchase a base water supply of 14,790 acre-feet per year and a supplemental supply of 10,311 acre-feet per year. (S-YCWA 15, Appendix A.) All diversion and use of water from the Yuba River by Ramirez is subject to the conditions contained in YCWA's water right permits.

10.8 Water Use in the Dantoni Area

Several water users divert from the lower Yuba River downstream of Daguerre Point Dam in an area on the south side of the river referred to as the Dantoni area. Information regarding water diversions in the Dantoni area comes from the Statements of Water Diversion and Use filed with the SWRCB and from YCWA reports relating to water demands. (YCWA 45, Tables A-2 and A-7; Statements 315, 316, 317, and 7900 filed by Nuames Inc.; and Statement of 2208 filed by Quinco Corp.) All of the Statements of Water Diversion and Use claim riparian rights.

In addition to water diverted under claim of riparian right, YCWA provides water to Nuames Inc. and Dorothy Wilbut under contract. (R.T. VI, 24:15-24:19.) YCWA estimates that 2,620 acre-feet of groundwater and 7,180 acre-feet of surface water are used to irrigate approximately 2,750 acres of orchard within the Dantoni area. (YCWA 45, Tables A-2 and A-7.)

In accordance with Water Code section 5100 et seq, water users in the Dantoni area should file Statements of Water Diversion and Use to substantiate their claimed basis of right. The water users should provide complete information on monthly and annual water diversions on all future triennial Supplemental Statements of Water Diversion and Use. Prior to entering into new contracts or continuing to deliver water under existing contracts, YCWA should identify the points of diversion of the Dantoni area users to which it delivers water and petition to have those points of diversion added to its existing permits. (See Section 10.2 above.)

10.9 Western Water Company, Western Aggregates, Inc. and YG Development Company

Evidence was presented at the hearing in 1992 that YG Development Co. and Western Aggregates, Inc. (YG) own several thousand acres of land on the south bank of the lower Yuba River. (YG 1, p. 1.) The area is referred to as the Yuba Goldfields and it consists mainly of "dredger tailings" left over from gold mining operations. In some areas, the dredger tailings reach depths of 125 feet. (Staff 1a, Statement of Water Diversion and Use 8291.) In 2000, a representative of Western Water Company testified that his company had obtained an undefined portion of the water rights that attach to the Yuba Goldfields. (S-R.T. 1924:18- 1930:25.)

Prior to the dredging operations, the Yuba River Channel ran to the south of Daguerre Point, through the center of the YG land. (R.T. IX, 51:1-51:6.) The dredging operations disturbed much of YG's land and ultimately resulted in relocating the Yuba River to its present day course along the northern boundary of the Yuba Goldfields property.

Water Rights: YG claims both riparian and pre-1914 appropriative water rights. (YG Exh. 1, p. 1.) Yuba Goldfields, Inc. (prior owner of the land now owned by YG) filed Statement of Water Diversion and Use 8291 in 1974. The statement claims a water right for the purposes of domestic, agricultural, and recreational use, dredging for precious metals (mining) and fish

culture. The season of use appears to be all year long, but the quantity of water is not specified in the statement. (Staff 1a, Statement 8291.)

YG presented testimony that water was diverted for continuous use for as many as 10 dredges on the property from 1904 through 1960. From 1969 to 1973, no record of use was maintained. From 1973 through 1978, water was used only intermittently for mining operations. The dredge in operation in 1992 ~~was~~ has been in continuous operation since 1978. It uses a minimum of 25,000 gallons per minute (55 cfs). The water is used in a sluicing operation and then discharged back into a pond (YG 1, p. 3.) Water is also pumped from the ponds for irrigation of between 200 and 500 acres of grain crops on the YG property. (YG 1, p. 3; R.T. IX, 48:18, 53:2-54:12.) YG does not purchase water from YCWA.

YG's water rights were defined by a Superior Court judgment entered in 1929. The judgment concludes that YG's predecessor had been engaged in gold mining on riparian property for a period of 20 years and that YG's predecessor was then using 20.6 cfs. In addition, the court found that YG's predecessor "is now developing" the irrigable portions of its property and was entitled to 5,905 acre-feet, as against the plaintiff, to be diverted in accordance with a defined monthly diversion schedule with an allowance for reasonable ditch losses.

The effect of the 1929 judgment was to define YG's predecessor's pre-1914 rights and to establish the riparian status of the YG property. The judgment refers to the priority of the "appropriations" made by YG's predecessor and enjoins a competing water user from interfering with YG's predecessor's rights to divert up to 20.6 cfs for dredging under a pre-1914 right. There is some evidence in the record that this right may have since been reduced by five or more years of reduced use, but there is insufficient evidence to reach a conclusion regarding the present extent of YG's pre-1914 right.⁵⁹ In order to document present and future use of water under its pre-1914 right, YG and any of its successors in interest who claim to have a water right

⁵⁹ Although there is some incidental loss, the SWRCB considers diversion of water for use in dredging to be a non-consumptive use of water when most of the water reenters the watercourse shortly after being used.

should provide complete monthly and annual water diversion information on all future triennial Supplemental Statements of Water Diversion and Use.

Conveyance of Water Across YG Property to Brophy and South Yuba: The United Groups complaint questioned whether YG's predecessor had sold or transferred water to YCWA, Brophy, or South Yuba without a valid basis of right. In 1982, YG's predecessor, Yuba Natural Resources, Inc., entered into a contract with Brophy which provided for Brophy to purchase and transport water across land owned by Yuba Natural Resources, Inc. In 1983, Yuba Natural Resources, Inc. entered into a similar contract with South Yuba. As discussed above, the pre-1914 rights for dredging that attach to the YG property were for what is primarily a non-consumptive use of water. The riparian rights attaching to the property are for use only on the particular riparian parcel of property to which they attach. Therefore, it is not clear what rights YG's predecessor had that would have authorized it to deliver water to either Brophy or South Yuba as called for in the contracts.

YCWA presented testimony that in 1991, it purchased conveyance rights across the Yuba Goldfields. (YCWA 2, p. 13.) There is substantial seepage of water into the canal as it crosses the goldfields, but YCWA accounts for the additional water as Yuba River water diverted under YCWA's rights. (YCWA 2, p. 3.) The water measurement gage on the South Canal near the Hammonton-Smartville Road is the billing point for water delivered under YCWA's rights to Brophy and South Yuba. (R.T. VII, 164:3-164:24.) The evidence indicates that, under the current arrangement, YG has granted YCWA the right to convey water across its property and YCWA provides water to Brophy and South Yuba [that is diverted under YCWA's water right permits](#).

11.0 CONCLUSION

The minimum flows presently specified in Water Right Permits 15026, 15027 and 15030 are based on a 1962 agreement between YCWA and DFG. The 1962 agreement was superseded by a later agreement between the same two agencies signed in 1965, but the water right permits

were not amended accordingly. The historic flows in the lower Yuba River usually have exceeded the flows specified in the 1965 agreement. If the flows were reduced to the levels specified in the 1965 agreement, the habitat available to salmon, steelhead, and American shad would be substantially reduced, contrary to the policy of the Salmon, Steelhead and Anadromous Fisheries Program Act (Fish and Game Code § section 6900, et seq), the California Endangered Species Act (Fish and Game Code §§2050-2116) and the Federal Endangered Species Act (16 U.S.C. §§ 1531-1544.) The minimum flows specified in the 1965 agreement are not sufficient to keep fish in good condition as required by Fish and Game Code section 5937.

There presently is much more information available concerning lower Yuba River fishery resources than was available in 1962 or 1965. The revised instream flow requirements established in this decision are supported by extensive evidence in the record and will provide increased protection for the fishery resources of the lower Yuba River. If future studies establish the need for refinements in the requirements adopted in this decision, the SWRCB may do so under its continuing authority.

The instream flow requirements established by this decision will require substantially less water than would be needed to meet the recommendations of the 1991 DFG Fisheries Management Plan. The evidence shows that there is sufficient water available to meet the revised requirements while continuing to meet existing demands for other reasonable and beneficial uses of water within Yuba County. YCWA's estimates of water supply deficiencies were based on computer modeling using estimates of YCWA's present and ultimate water demand. The evidence shows that the present level of demand for water from the lower Yuba River in the YCWA service area is less than estimated by YCWA and that the future level of demand is likely to be considerably less than the YCWA estimates.

Implementation of expanded water conservation programs can help minimize future increases in overall water demand. Increased water conservation and water management efforts, including a conjunctive use program of groundwater and surface water supplies, should allow YCWA to

comply with the revised conditions of its permits while meeting reasonable future water demands in its service area. [In addition to establishing different instream flow requirements for different water-year types, this order contains a Deficiency Clause allowing for temporary changes in the flow requirements in years in which surface water supply would be insufficient to supply 80 percent of projected demand.](#) The SWRCB retains continuing authority to reconsider the subject of instream flow requirements in the event changed conditions make it infeasible to comply with the requirements specified in this decision.

The record establishes that the water temperatures in the lower Yuba River often are higher than is desirable for protection of chinook salmon and steelhead. However, the record also establishes that, with the existing facilities, YCWA does not always have the ability to provide cooler water at the temperatures recommended by the fishery agencies. YCWA has applied for funding to construct the Narrows II Powerhouse Intake Extension Project that would provide a low level outlet at Englebright Reservoir to enable release of cooler water. Construction of that project that would increase YCWA's ability to release water in the lower Yuba River meeting the temperature recommendations of state and federal resource agencies.

This decision directs YCWA to diligently pursue development of the Narrows II Powerhouse Extension Project and to submit a progress report to the Chief of the Division of Water Rights every six months until the project is complete. This decision also directs YCWA to participate on an ongoing basis in a Temperature Advisory Committee with representatives of specified resource agencies and environmental groups to determine the most desirable and feasible means of operating to provide water at temperatures suitable for the fisheries in the lower Yuba River. The decision requires YCWA to file an annual operations plan and monitoring report with the Division of Water Rights and to advise the Chief of Division of Water if YCWA believes it is not feasible to operate in accordance with the recommendations of the Temperature Advisory Committee. The decision retains continuing authority over YCWA to establish water temperature requirements at a future time following notice and opportunity for hearing.

The record also establishes that there are unnecessary and reasonably avoidable losses of fish due to water diversions into the South Canal and the North Canal. The specific causes and magnitude of the losses, as well as the appropriate corrective actions, vary with each facility. In each case, however, YCWA and the parties diverting water at that site should be required to study the problem in consultation with the appropriate resource agencies and prepare a plan for a corrective action to reduce fish loss in accordance with the provisions of this decision.

All water rights in California are subject to continuing regulation in order to comply with the constitutional mandate to maximize the reasonable and beneficial use of water and to avoid wasteful or unreasonable uses, methods of uses, or methods of diversion. (California Constitution, art. X, § 2; Water Code §§ 100 and 275.) The revised permit conditions and other requirements set forth in this decision are [appropriate to the situation under consideration and are](#) needed in order to comply with applicable constitutional and statutory requirements regarding reasonable use and methods of diversion.

In addition, the California Supreme Court decision in *National Audubon Society v. Superior Court, supra*, requires this Board to consider the impact of water diversions on public trust resources and to protect those resources where feasible. The fishery protection measures established in this decision constitute a [physically and financially](#) feasible means of protecting public trust resources of the lower Yuba River while continuing to provide sufficient water for other beneficial uses.

Finally, this decision addresses a number of questions concerning the adequacy of water rights held by various diverters and actions needed to ensure that future water diversions are undertaken in accordance with applicable law. Our findings on these issues are set forth in Sections 10.0 through 10.9 above.

ORDER

IT IS HEREBY ORDERED that the specified water right permits and licenses below are amended as shown and that the identified permittees, licensees and other water users comply with the directives set forth below:

Yuba County Water Agency

Permits 15026, 15027, and 15030 of Yuba County Water Agency are amended to include the following terms:

1. For the protection of fish and other public trust resources in the lower Yuba River, permittee shall release or bypass sufficient water to maintain the following instream flows in the lower Yuba River: The minimum flow requirements shall be maintained as measured by a 5-day running average of daily streamflows with instantaneous flows never less than 90 percent of the specified flow requirements.
 - a. Beginning April 21 of 2006, sStreamflow shall be maintained at or above ~~the following average-daily~~ flows specified in the following table as measured at the USGS gaging installations at Marysville and Smartville:

Periods	Wet, Above Normal & Below Normal Years (cfs)		Dry Years (cfs)		Critical Years (cfs)		Extreme Critical Years (cfs)	
	Smartville Gage	Marysville Gage	Smartville Gage	Marysville Gage	Smartville Gage	Marysville Gage	Smartville Gage	Marysville Gage
Sept. 15 - Oct 14	700	250	500	250	400	250	400	250
Oct 15 - Apr 20	700	500	700 600	500 400	700 600	500 400	700 600	500 400
Apr 21 - Apr 30	--	1,000	--	1,000	--	1,000	--	500
May 1 - May 31	--	2,000 1,500	--	1,500	--	1,100	--	500
Jun 1	--	1,400 1,050	--	1,100 1,050	--	800	--	500
Jun 2	--	980 800	--	900 800	--	800	--	500
Jun 3 - Jun 30	--	800	--	800	--	800	--	500
Jul 1	--	560	--	560	--	560	--	500
Jul 2	--	390	--	390	--	390	--	390
Jul 3 - Sept. 14	--	250	--	250	--	250	--	250

* "Extreme Critical" year classification is defined as: Equal to or less than 540 TAF on the Yuba River Index scale.

b. For purposes of this order, wet, above normal, below normal, dry and critical water year types in the table above are as defined in the Yuba River Index. (See Appendix 1.) Extreme critical water years are defined as years when the Yuba River Index is predicted to be less than 540 thousand acre-feet. Determination of water year classifications shall be made on April 1 of each year, in accordance with the forecast of unimpaired flow of the Yuba River at Smartville published in California Department of Water Resources Bulletin 120. The year type for the preceding water year shall remain in effect until April 1 when the current year forecast is available.

c. In order to avoid potential aggravation of the electrical energy crisis in California present in early 2001, the flows specified above in part “a.” of this term shall come into effect on April 21, 2006. In the interim period, streamflow shall be maintained at or above the flows specified in the following table as measured at the USGS gaging installations at Marysville and Smartville.

Period	Wet & Above Normal Years (cfs)		Below Normal Years (cfs)		Dry Years (cfs)	
	Smartville Gage	Marysville Gage	Smartville Gage	Marysville Gage	Smartville Gage	Marysville Gage
Sep 15-Oct14	700	250	550	250	500	250
Oct 15-Apr 20	700	500	700	500	600	400
Apr 21-Apr 30	--	1,000	--	900	--	400
May 1-May 31	--	1,500	--	1,500	--	500
Jun 1	--	1,050	--	1,050	--	400
Jun 2-Jun 30	--	800	--	800	--	400
Jul 1	--	560	--	560	--	280
Jul 2	--	390	--	390	--	250
Jul 3-Sep 14	--	250	--	250	--	250
Period	Critical Years (cfs)					
	Smartville Gage	Marysville Gage				
Sep 15-Oct14	400	150				
Oct 15-Apr 20	600	400				
Apr 21	--	280				
Apr 22-Apr 30	--	270				
May 1-May 31	--	270				
Jun 1	--	195				
Jun 2	--	140				
Jun 3-Sep 14	--	100				

2. To minimize water temperature impacts on anadromous fish and other public trust resources in the lower Yuba River, permittee shall comply with the following terms and conditions:
 - a. Permittee shall diligently pursue development of the Narrows II Powerhouse Intake Extension Project at Englebright Dam, in coordination with the Department of Fish and Game, the United States Fish and Wildlife Service and the National Marine Fisheries Service. Permittee shall submit proposals for project funding and prepare all appropriate CEQA documentation for project development in a timely manner. Permittee shall submit a report to the Chief of the Division of Water Rights on the status of its application for funding and the progress of project development every six months from the date of this Order through the completion of project construction.

- b. Permittee shall coordinate operation of available temperature control devices to minimize temperature impacts on anadromous fishery resources in the lower Yuba River. Permittee shall consult with the Temperature Advisory Committee (composed of representatives from the SWRCB, the Department of Fish and Game, the United States Fish and Wildlife Service, the National Marine Fisheries Service, the California Sportfishing Protection Alliance and the South Yuba River Citizens League) on a regular basis during the temperature control season (May through October). Permittee shall monitor water temperature effects of project operations and report to the Advisory Committee on a regular basis. Permittee shall discuss with the Committee current operations for temperature control and variances from the temperatures needed to provide suitable habitat for anadromous fish. Permittee shall make changes to project operations for temperature control as recommended by the Temperature Advisory Committee on a real-time basis, unless Permittee ~~demonstrates to~~ informs the Chief of the Division of Water Rights within 14 days that the Committee recommendation is infeasible and explains the basis for that conclusion.
- c. Prior to April 1 of each year, permittee shall prepare an annual operations plan for water temperature control in consultation with the Temperature Advisory Committee. The plan shall specify actions to be taken to maintain suitable water temperatures for anadromous fish in the subsequent May through October period. The plan shall be submitted to the Chief of the Division of Water Rights for approval by April 1 of each year, and shall describe proposed operations for the subsequent May through October period.
- d. Permittee shall install and operate automated temperature monitoring equipment and record water temperatures on an hourly basis at the Smartville Gage, Daguerre Point Dam, and the Marysville Gage. Permittee shall prepare an annual monitoring report that summarizes the results of water temperature monitoring for the previous water year at the above-described locations and describes operations to minimize water temperature

impacts on anadromous fish. The monitoring report covering the previous water year ending September 30 shall be submitted to the Chief of the Division of Water Rights by December 31 of each year.

- e. The SWRCB retains continuing authority over this permit to establish water temperature requirements for the lower Yuba River for the protection of fishery resources following notice and opportunity for hearing.
3. With the exception of emergencies, flood flows, [bypasses of uncontrolled flows into Englebright Reservoir, uncontrolled spilling,](#) or uncontrolled flows of tributary streams downstream of Englebright Dam, permittee shall make reasonable efforts to operate New Bullards Bar Reservoir and Englebright Reservoir to avoid fluctuations in the flow of the lower Yuba River downstream of Englebright Dam. Daily changes in project operations affecting releases or bypasses of flow from Englebright Dam shall be continuously measured at the USGS gage at Smartville and shall be made in accordance with the following conditions:
 - a. Project releases or bypasses that increase streamflow downstream of Englebright Dam shall not exceed a rate of change of more than 500 cfs per hour.
 - b. Project releases or bypasses that reduce streamflow downstream of Englebright Dam shall be gradual and, over the course of any 24-hour period, shall not be reduced below 70 percent of the prior day's flow release or bypass flow.
 - c. Once the daily project release or bypass level is achieved, daily fluctuations in the streamflow level downstream of Englebright Dam due to changes in project operations shall not vary up or down by more than 15 percent.

- d. During the period from September 15 to October 31, permittee shall not reduce the flow downstream of Englebright Dam to less than 55 percent of the maximum release or bypass level that has occurred during that September 15 to October 31 period or the minimum streamflow requirement that would otherwise apply, whichever is greater.
 - e. During the period from November 1 to March 31, permittee shall not reduce the flow downstream of Englebright Dam to less than the minimum streamflow release or bypass established under (d) above; or 65 percent of the maximum flow release or bypass that has occurred during that November 1 to March 31 period; or the minimum streamflow requirement that would otherwise apply, whichever is greater.
4. By July 1, 2001, permittee shall submit, for approval of the Chief of the Division of Water Rights, a report specifying the types and locations of gages that are capable of continuously measuring flows and temperatures required by the conditions of this permit. The report shall include a construction schedule for installation of any additional gages which may be needed to continuously measure flows and temperatures at the locations specified in this permit. No water shall be diverted under this permit unless permittee installs the devices in accordance with the plan and construction schedule as approved by the Chief of the Division of Water Rights. Permittee shall ensure that said devices are properly maintained.
 5. ~~A-Permittee shall maintain a~~ continuous record of the daily instream flows at the Smartville and Marysville Gages ~~project releases and bypass flows and temperatures,~~ sufficient to document compliance with the terms of this permit. Permittee shall also maintain hourly records of water temperatures at Marysville, Smartville and Daguerre Point Dam. ~~, shall be maintained by permittee and~~ Permittee shall be available ~~make flow and temperature records available~~ to the SWRCB and to other interested parties upon request of the SWRCB.
 6. Permittee shall submit a report by December 31 of each year that verifies permittee's compliance with all permit conditions for the previous water year ending September 30. The

report shall be submitted to the Division of Water Rights in a format designated by the Chief of the Division of Water Rights.

7. By July 1, 2001, permittee shall submit for approval of the Chief of the Division of Water Rights a plan that describes the scope and duration of studies to be conducted to verify that salmon and steelhead redds and fry are being adequately protected from dewatering or stranding. Permittee shall consult with the Department of Fish and Game, the United States Fish and Wildlife Service, and the National Marine Fisheries Service regarding the development and scope of the plan. Following approval of the plan, the studies shall be conducted in accordance with the schedule specified in the plan. Pending completion of the studies, summary reports shall be submitted annually to the Division of Water Rights by December 31 and a final report with recommendations should be submitted within one year of the completion of the study.

8. Permittee, in conjunction with the water districts or other water users receiving water from the Hallwood-Cordua Canal (North Canal) and the South Yuba-Brophy Canal (South Canal), shall consult with the Department of Fish and Game, the National Marine Fisheries Service, and the United States Fish and Wildlife Service to develop plans to reduce fish losses resulting from diversion of water into the canals. [The plan shall identify proposed sources of funding, including any money available under state or federal grants.](#) Conditions of the plans shall result in compliance with all applicable requirements of the state and federal endangered species acts. If the Department of Fish and Game or the National Marine Fisheries Service determines that a potential take of listed species will result from diversion of water into the canals, permittee shall obtain appropriate authorization for incidental take. In order to continue diversion of water at the Hallwood-Cordua and South Yuba-Brophy canals, the plans to reduce fish losses and any required incidental take authorization shall be provided to the Chief of the Division of Water Rights by December 31, 2001. The Chief of the Division of Water Rights shall review the adequacy of the plans for protection of fish and the schedule for implementing

the proposed actions. If the plans are not adequate, they shall be revised in accordance with the direction of the Chief of the Division of Water Rights.

9. This permit does not authorize any act that results in the taking of a threatened or endangered species or any act which is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code § 2050 et seq) or the federal Endangered Species Act (16 U.S.C. § 1531 et seq.). If a “take” will result from any act authorized under this permit, permittee shall obtain authorization for incidental take ~~prior to construction or operation~~. Permittee shall be responsible for meeting all requirements of the applicable Endangered Species Act for diversion of water under this permit and related actions.

10. If the forecasted Yuba River Index (YRI) on April 1 is less than or equal to 790 TAF, permittee may file a request with the Chief of the Division of Water Rights (Division Chief) for a temporary reduction in the instream flow requirements applicable to this permit, if permittee estimates that it will have deficiencies of more than 20 percent of projected demand for surface water deliveries within the YCWA service area for the calendar year.

For the purpose of this permit term, "projected demand" for the calendar year shall be based upon the sum of the following:

- (1) Permittee’s projected demand for surface water deliveries to Dry Creek Mutual Water Company (Dry Creek) for the current year, not to exceed 16,743 acre-feet;
- (2) Permittee’s projected demand for surface water deliveries to Wheatland Water District and Wheatland Water District Detachments (Wheatland) for the current year, not to exceed 40,855 acre-feet; and
- (3) Permittee’s projected demand for surface water deliveries for the remainder of permittee’s authorized place of use within the permittee’s service area (excluding Dry Creek and Wheatland) for the current year, not to exceed 273,847 acre-feet.

The projected demand figures shall specify permittee's surface water deliveries to each water district or other recipient that have occurred during the calendar year as of the date of permittee's request and permittee's projected demand for surface water deliveries for the remainder of the current calendar year. Permittee's request shall include documented data on actual surface water deliveries by permittee to Dry Creek and Wheatland for the past three years (if applicable) and expected surface water demand for Dry Creek and Wheatland for the current calendar year.

If permittee files a request to reduce instream flow requirements pursuant to this permit term, permittee shall develop an alternative instream flow proposal, following notification to and consultation with the Department of Fish and Game (DFG), that would allow permittee to meet up to 80 percent of its projected demand for the current year. The alternative instream flow proposal shall be included with permittee's request and shall propose instream flows to remain in effect from the date of approval by the Division Chief for the remainder of the calendar year. Any request for a temporary reduction in instream flow requirements shall be submitted by April 7 of the year for which the reduction is requested, in order to facilitate action by the Division Chief upon the request prior to April 21 of each year.

Following review of the request submitted by permittee and other relevant information, the Division Chief shall have the authority to approve a temporary reduction in the instream flow requirements for the period of April 21 through December 31 (or a portion thereof) of the year in which the flow reduction request is submitted. The Division Chief may approve a temporary reduction of instream flow requirements, as requested by permittee or as otherwise justified by the available information, but in no event shall the temporary instream flow requirements approved pursuant to this permit term be less than proposed in permittee's request or less than the instream flows required under part c of the condition added as Term 1 of this order. The Division Chief shall notify permittee and DFG of the Division Chief's action upon the request for a temporary reduction of applicable instream flow requirements. The Division Chief's

action upon a request for temporary reduction of instream flow requirements shall be subject to reconsideration by the State Water Resources Control Board.

If a temporary reduction in instream flow requirements is approved, permittee shall submit a report to the Division Chief that accounts for actual surface water deliveries, any curtailments of requested surface water deliveries to customers in Yuba County, and instream flows in the Yuba River at Marysville for the year during which any reduced flow requirements are in effect. The report shall be submitted by February 1 of the following year.

11. Permittee shall maintain a continuous record showing the quantities of water diverted from the lower Yuba River under Permits 15026, 15027 and 15030 at all points of diversion and rediversion. Such records shall be available to the SWRCB and to other interested parties upon request of the SWRCB.

In addition to the new terms specified above, Permits 15026, 15027 and 15030 are amended as follows:

1. Paragraph 2 of Permits 15026, 15027 and 15030 titled "Location of Point(s) of Diversion," shall be corrected to describe the point of diversion/rediversion located on the lower Yuba River within the SW¹/₄ of the SW¹/₄ of Section 29, T16N, R5E, MDB&M as follows:

"Daguerre Point Dam, located within the SW¹/₄ of the SW¹/₄ of Section 29, T16N, R5E, MDB&M and having the following California Co-ordinates: N56054, E2157846."

2. Permit term 20 of Permit 15026, permit term 19 of Permit 15027, and permit term 19 of Permit 15030 are deleted from said permits.

In addition to the above terms amending Yuba County Water Agency's permits, it is further ordered that:



1. Yuba County Water Agency shall file and diligently pursue petitions for change with the SWRCB, requesting the addition of: ~~(1) points of diversion/diversion to serve diverters within the permitted place of use in the Dantoni area; and (2) points of rediversion from the natural channel of Reeds Creek for waters transported from the lower Yuba River via Reeds Creek to supply Brophy Water District and South Yuba Water District.~~ The petitions shall be filed within one year of the date of this order.

2. Prior to the submittal of the petition(s) for change to add points of diversion/diversion, Yuba County Water Agency shall consult with the Department of Fish and Game and conduct an evaluation of fish losses from diversions in the Dantoni area ~~and from Reeds Creek.~~ The results of the evaluation, along with proposed alternatives and recommendations for any reasonable improvements that could be made to reduce fish losses at these points of diversion and the parties responsible for implementing the improvements shall be submitted to the SWRCB along with the petitions for change.

Browns Valley Irrigation District

It is further ordered that:

1. Browns Valley Irrigation District shall operate and maintain the fish screen at the Pumpline Diversion Facility to meet current Department of Fish and Game and National Marine Fisheries Service screening criteria for juvenile salmonids. ~~Browns Valley Irrigation District, in conjunction with Yuba County Water Agency, shall prepare and submit an annual report to the Chief of the Division of Water Rights on the operation and maintenance of the fish screen by December 31 of each year. The Chief of the Division of Water Rights shall review the operations reports on an annual basis.~~ If the screen is not operated and maintained to meet the Department of Fish and Game and National Marine Fisheries Service criteria, the SWRCB may exercise its continuing authority to require additional measures for the protection of fish at the Browns Valley Pumpline Diversion Facility.
2. If Browns Valley Irrigation District intends to divert water from the Yuba River in excess of the ~~pre-1914~~ quantities specified in [Table 23 of](#) the findings of this order, ~~and plus~~ the quantity provided by the 1981 contract with Yuba County Water Agency, Browns Valley Irrigation District shall either apply for a water right permit from the SWRCB, or amend the contract with Yuba County Water Agency to allow Browns Valley Irrigation District to divert additional water under Yuba County Water Agency's existing rights. Diversion of water not covered by a [pre-1914 water right](#), water right permit, or contract with Yuba County Water Agency may be construed a trespass pursuant to section 1052 et seq. of the Water Code.
3. ~~Prior to July 1, 2001, Browns Valley Irrigation District shall file a Statement of Water Diversion and Use pursuant to Water Code section 5100 et seq. along with appropriate documentation to substantiate the claimed pre-1914 diversion right from the Yuba River.~~ Browns Valley Irrigation District shall provide complete monthly and annual water diversion

information on all future triennial Supplemental Statements of Water Diversion and Use [submitted pursuant to Water Code section 5103](#).

Cordua Irrigation District

It is further ordered that Licenses 3984 and 3985 of Cordua Irrigation District are amended to include the following terms:

1. Licensee, in conjunction with Yuba County Water Agency, Hallwood Irrigation Company, and Ramirez Water District shall consult with the Department of Fish Game, the National Marine Fisheries Service and the United States Fish and Wildlife Service to develop a plan to reduce fish losses resulting from diversion of water at the Hallwood-Cordua Canal (North Canal). [The plan shall identify proposed sources of funding, including any money available under state or federal grants](#). Conditions of the plan shall result in compliance with all applicable requirements of the state and federal endangered species acts. If the Department of Fish Game or the National Marine Fisheries Service determines that a potential take of listed species will result from diversion of water, licensee shall obtain appropriate authorization for incidental take. In order to continue diversion of water at the Hallwood-Cordua Canal, the plan to reduce fish losses and any required incidental take authorization shall be provided to the Chief of the Division of Water Rights within one year of the date of this order. The Chief of the Division of Water Rights shall review the adequacy of the plan for protection of fish and the schedules for implementing the proposed actions. If the plan is not adequate, it shall be revised in accordance with the direction of the Chief of the Division of Water Rights.
2. Licensee shall provide complete monthly and annual water diversion information relevant to License 3984 and License 3985 on all future triennial Reports of Licensee. Reports of licensee shall specify the monthly and annual quantities of water diverted under each license.

In addition to the above terms amending Cordua Irrigation District's Licenses 3984 and 3985, it is further ordered that:

1. Prior to July 1, 2001, Licensee shall file a petition with the SWRCB requesting a change in the licensed place of use defined under Licenses 3984 and 3985 to accurately reflect licensee's service area.
2. Prior to July 1, 2001, Licensee shall file a Statement of Water Diversion and Use in accordance with Water Code section 5100 et seq., together with appropriate documentation to substantiate the claimed pre-1914 diversion right from the Yuba River. Licensee shall provide complete monthly and annual water diversion information relevant to said Statement on all future triennial Supplemental Statements of Water Diversion and Use.

Hallwood Irrigation Company

It is further ordered that License 4443 of Hallwood Irrigation Company is amended to include the following terms:

1. Licensee, in conjunction with Yuba County Water Agency, Cordua Irrigation District, and Ramirez Water District shall consult with the Department of Fish and Game, the National Marine Fisheries Service, and the United States Fish and Wildlife Service to develop a plan to reduce fish losses resulting from diversion of water at the Hallwood-Cordua Canal (North Canal). [The plan shall identify proposed sources of funding, including any money available under state or federal grants.](#) Conditions of the plan shall result in compliance with all applicable requirements of the state and federal endangered species acts. If the Department of Fish and Game or the National Marine Fisheries Service determines that a potential take of listed species will result from diversion of water, licensee shall obtain appropriate authorization for incidental take. In order to continue diversion of water at the Hallwood-Cordua Canal, the plan to reduce fish losses and any required incidental take authorization shall be provided to the Chief of the Division of Water Rights by December 31, 2001. The Chief of the Division of Water Rights shall review the adequacy of the plan for protection of fish and the schedules for

implementing the proposed actions. If the plan is not adequate, it shall be revised in accordance with the direction of the Chief of the Division of Water Rights.

2. Licensee shall provide complete monthly and annual water diversion information relevant to License 4443 on all future triennial Reports of Licensee. Reports of licensee shall specify the monthly and annual quantities of water diverted under this license.

In addition to the above terms amending Hallwood Irrigation Company License 4443, it is further ordered that:

1. Prior to July 1, 2001, Hallwood Irrigation Company shall file a Statement of Water Diversion and Use in accordance with Water Code section 5100 et seq., together with appropriate documentation to substantiate the claimed pre-1914 diversion right from the Yuba River. Hallwood should provide complete monthly and annual water diversion information relevant to said Statement on all future triennial Supplemental Statements of Water Diversion and Use.
2. Hallwood Irrigation Company shall be limited to the diversion season specified in water right License 4443 and the 1980 contract with Yuba County Water Agency, both of which allow diversion between April 1 and November 1 of each year. If Hallwood Irrigation Company desires to extend its diversion season, it shall either apply for a water right permit with the SWRCB, or amend the contract with Yuba County Water Agency to allow diversion during other months. Diversion of water in the absence of the required documentation may be considered a trespass pursuant to section 1052 et. seq. of the Water Code.

Ramirez Water District

It is further ordered that:

1. Ramirez Water District, in conjunction with Yuba County Water Agency, Cordua Irrigation District, and Hallwood Irrigation Company shall consult with the Department of Fish and Game, the National Marine Fisheries Service, and the United States Fish and Wildlife Service to develop a plan to reduce fish losses resulting from diversion of water at the Hallwood-Cordua Canal (North Canal). [The plan shall identify proposed sources of funding, including any money available under state or federal grants.](#) Conditions of the plan shall result in compliance with all applicable requirements of the state and federal endangered species acts. If the Department of Fish and Game or the National Marine Fisheries Service determines that a potential take of listed species will result from diversion of water, appropriate authorization for incidental take shall be obtained. In order to continue diversion of water at the Hallwood-Cordua Canal, the plan to reduce fish losses and any required incidental take authorization shall be provided to the Chief of the Division of Water Rights by December 31, 2001. The Chief of the Division of Water Rights shall review the adequacy of the plan for protection of fish and the schedules for implementing the proposed actions. If the plan is not adequate, it shall be revised in accordance with the direction of the Chief of the Division of Water Rights.

South Yuba Water District

It is further ordered that:

1. South Yuba Water District, in conjunction with Yuba County Water Agency and Brophy Water District, shall consult with the Department of Fish and Game, the National Marine Fisheries Service, and the United States Fish and Wildlife Service to develop a plan to reduce fish losses resulting from diversion of water into the South Yuba-Brophy Canal (South Canal). [The plan shall identify proposed sources of funding, including any money available under state or federal grants.](#) Conditions of the plan shall result in compliance with all applicable requirements of the state and federal endangered species acts. If the Department of Fish and Game or the National Marine Fisheries Service determines that a potential take of a listed species will result from diversion of water, permittee shall obtain appropriate authorization for incidental take. In order to continue diversion of water at the South Yuba-Brophy Canal, the plan to reduce fish losses and any required incidental take authorization shall be provided to

the Chief of the Division of Water Rights by December 31, 2001. The Chief of the Division of Water Rights shall review the adequacy of the plan for protection of fish and the schedule for implementing the proposed actions. If the plan is not adequate, it shall be revised in accordance with the direction of the Chief of the Division of Water Rights.

Brophy Water District

It is further ordered that:

1. Brophy Water District, in conjunction with Yuba County Water Agency and South Yuba Water District, shall consult with the Department of Fish and Game, the National Marine Fisheries Service, and the United States Fish and Wildlife Service to develop a plan to reduce fish losses resulting from diversion of water into the South Yuba-Brophy Canal (South Canal). [The plan shall identify proposed sources of funding, including any money available under state or federal grants.](#) Conditions of the plan shall result in compliance with all applicable requirements of the state and federal endangered species acts. If the Department of Fish and Game or the National Marine Fisheries Service determines that a potential take of listed species will result from diversion of water, permittee shall obtain appropriate authorization for incidental take. In order to continue diversion of water at the South Yuba-Brophy Canal, the plan to reduce fish losses and any required incidental take authorization shall be provided to the Chief of the Division of Water Rights by December 31, 2001. The Chief of the Division of Water Rights shall review the adequacy of the plan for protection of fish and the schedule for implementing the proposed actions. If the plan is not adequate, it shall be revised in accordance with the direction of the Chief of the Division of Water Rights.

~~2. Measuring devices shall be installed at all points of diversion and/or rediversion from the South Canal. A continuous record of the diversions at the headworks of the South Canal and rediversions from Reeds Creek shall be maintained by Brophy Water District and shall be available to SWRCB and to other interested parties upon request of the SWRCB.~~

Western Water Company, Western Aggregates, Inc., and YG Development Company

It is further ordered that:

1. Western Water Company, Western Aggregates, Inc., and YG Development Company shall provide complete monthly and annual water diversion information relevant to Statement 8291 on all future triennial Supplemental Statements of Water Diversion and Use.
2. Western Water Company, Western Aggregates, Inc. and YG Development Company. shall consult with the Department of Fish and Game, the National Marine Fisheries Service, and the United States Fish and Wildlife Service and work cooperatively to develop a project to eliminate access of adult salmon to the Yuba Goldfields [through the Yuba Goldfields return channel](#). Western Water Company, Western Aggregates, Inc. and YG Development Co. shall submit a report to the Chief of the Division of Water Rights on the progress of project development beginning July 1, 2001 and continuing every six months thereafter until completion of project construction.
- ~~3. Western Water Company, Western Aggregates, Inc. and YG Development shall consult with the California Regional Water Quality Control Board for the Central Valley Region to determine of waste discharge requirements are needed for discharge of the water entering the Yuba River from the Yuba Goldfields return channel. If waster discharge requirements are required, Western Water Company, Western Aggregates, Inc. and YG Development Company shall file and diligently pursue an application for waste discharge requirements with the Regional Board.~~

Lake Wildwood Association

It is further ordered that:

1. The Chief of the Division of Water Rights, or his designee, is directed to meet with representatives from the Department of Fish and Game, Lake Wildwood Association and Yuba County Water Agency to discuss ways that the Lake Wildwood Association could change the operations of Lake Wildwood to reduce potential water temperature impacts to the Yuba River. Possible modifications to the operation of Lake Wildwood could include:

- a. Releasing water either earlier or later in the year.
- b. Releasing water to coincide with higher releases or bypass of water from Englebright Dam.
- c. Releasing a lesser quantity of water over a longer time.
- d. Using other vegetation removal methods at Lake Wildwood.

If those discussions do not result in development of a voluntary, mutually-acceptable solution, the Division of Water Rights is directed to conduct an investigation of the reasonableness of the Lake Wildwood Association's water use operations pursuant to Water Code sections 100 and 275, section 855 et. seq. of title 23 of the California Code of Regulations (Misuse of Water), and the SWRCB's continuing authority over Water Right License 10779.

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Compliance

It is further ordered that, in the event any of the actions specified in this order are not taken within the time specified in this order or such extension of time as may be allowed for good cause by the Chief of the Division of Water Rights, the Chief of the Division of Water Rights is directed to pursue appropriate enforcement action.

CERTIFICATION

The undersigned, Administrative Assistant to the Board, does hereby certify that the foregoing is a full and correct copy of a decision duly and regularly adopted at a meeting of the State Water Resources Control Board held on _____.

AYE:

NO:

ABSENT:

ABSTAIN:

Maureen Marché
Administrative Assistant to the Board

*The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption.
For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.swrcb.ca.gov.*

