Enclosure 2

NOAA FISHERIES - ESSENTIAL FISH HABITAT CONSULTATION

Long-Term Central Valley Project and State Water Project Operations Criteria and Plan (OCAP)

Pursuant to section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens), Federal agencies are required to consult with the Secretary of Commerce (delegated to NOAA Fisheries) with respect to "any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat identified under this Act." In addition, the Magnuson-Stevens Act also provides that the Secretary of Commerce "shall coordinate with and provide information to other Federal agencies to further the conservation and enhancement of essential fish habitat[1]."

This essential fish habitat (EFH) Consultation is based on information received from the Bureau of Reclamation (Reclamation) in a section 7 Biological Assessment (BA) on the OCAP project, and the EFH Assessment (included as Chapter 14), dated June 30, 2004. A description of the project is provided in the BA as Chapter 2.

This consultation involves the EFH of species managed under three different fishery management plans (FMP) and discusses them in the following order: 1) the Pacific Groundfish FMP, 2) the Coastal Pelagic Species FMP, and 3) the Pacific Salmon FMP. With regards to the Pacific salmon FMP, because the accompanying OCAP Biological Opinion provides habitat protection for winter and spring-run Chinook salmon, this EFH consultation pertains only to fall and late-fall run Chinook salmon. In addition, because steelhead are not managed by the Pacific Fishery Management Council (the Council), EFH has not been designated for this species.

1.0 Pacific Groundfish Fishery Management Plan

Starry flounder (*Platichthys stellatus*) are managed under this FMP and were consulted upon by Reclamation because of their interaction with the Delta pumps. Because of the high numbers of fish taken at the pumps, NOAA Fisheries believes that the proposed project will affect the EFH of starry flounder.

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[1] 16 U.S.C. § 1855(b)(1)(D).

EFH Conservation Recommendation:

NOAA Fisheries recommends that Reclamation should insure that screening and salvage operations are developed that minimize the take of starry flounder. NOAA Fisheries believes that efforts to improve screening and salvaging efforts for fall/late-fall Chinook salmon (which are described further below) recommended will also benefit starry flounder.

2.0 Coastal Pelagic Species Fishery Management Plan

Northern anchovy (*Engraulis mordax*) is the only species managed under this FMP that occurs in the project area. NOAA Fisheries concurs with Reclamation that the proposed project will not affect the EFH of northern anchovy.

3.0 Pacific Salmon Fishery Management Plan

Chinook salmon (*Oncorhynchus tshawytscha*) are the largest of the Pacific salmon. Chinook salmon are highly prized by commercial, sport, and subsistence fishers. The fisheries of healthy Pacific coast chinook salmon stocks are managed by the Council under the Pacific Salmon Fishery Management Plan. Approximately, 80 percent of the California catch comes from the Central Valley as opposed to the Klammath River system (Dan Viele, personal communication). These stocks include fall and late-fall run Chinook salmon from the Klammath and Central Valley systems. In 2003, preliminary estimates of California coastal community and state personal income impacts of the troll and recreational salmon fishery collectively for the Fort Bragg, and San Francisco/Monterey port areas was $27.0 million and $10.7 million, respectively[2].

As noted by the Council, Chinook salmon eggs, alevins, and juveniles in freshwater streams provide an important nutrient input and food source for aquatic invertebrates, other fishes, birds, and small mammals. The carcasses of Chinook adults can also be an important nutrient input in their natal watersheds, as well as providing food sources for terrestrial mammals such as bears, otters, minks, and birds such as gulls, eagles, and ravens. Because of their relatively low abundance in coastal and oceanic waters, Chinook salmon in the marine environment are typically only an incidental food item in the diet of other fishes, marine mammals, and coastal sea birds.

In 1999, the Council identified EFH for Central Valley Chinook stocks to include the Sacramento and San Joaquin rivers and their tributaries as EFH[3]. Freshwater EFH for Chinook salmon consists of four major habitat functions: 1) spawning and incubation; 2) juvenile rearing; 3)

[2] PFMC. 2004. Review of 2003 ocean salmon fisheries. (Document prepared for the Council and its advisory entities.) Pacific Fishery Management Council, Portland OR, Table IV-16.

juvenile migration corridors; and 4) adult migration corridors and adult holding habitat.[3] Projected impacts associated with the proposed project are expected to eliminate, diminish, and/or disrupt these EFH habitat functions for fall and late-fall run Chinook salmon at many sites within the project area. As concluded in the EFH Assessment prepared by Reclamation, CVP and SWP operations will adversely affects the EFH of fall and late-fall run Chinook salmon.

In developing its EFH Conservation Recommendations, NOAA Fisheries recognized that all appropriate and practicable steps to avoid adverse effects to EFH and measures to minimize remaining adverse affects are constrained due to the existing operational conditions in the Central Valley that have transpired over the lifetime of managing water in the Central Valley. Consequently, available opportunities to avoid and minimize adverse effects may be limited. In addition, the agency's highest priority is to fulfill its conservation mandates for protecting winter and spring-run Chinook salmon, coho salmon and steelhead listed under the Endangered Species Acts (see OCAP Biological Opinion). In some instances, this priority may take precedent over protecting the EFH of fall and late-fall run Chinook salmon for particular locations.

Due to these limitations to avoid and minimize EFH impacts, NOAA Fisheries believes that available conservation measures may be insufficient to offset the expected further deterioration of EFH habitat functions in parts of the project area. Consequently, the agency included EFH Conservation Recommendations that advise Reclamation to consider compensatory mitigation as part of this consultation. As stated in the EFH regulations, the EFH Conservation Recommendations provided by NOAA Fisheries "...may include measures to avoid, minimize, mitigate, or other otherwise offset adverse effects on EFH from actions or proposed actions authorized, funded, or undertaken[4]..." by the Federal action agency. Consequently, the agency believes that in order to provide meaningful EFH Conservation Recommendations for conserving and enhancing EFH, it needs to look beyond options for avoiding and minimizing adverse affects and also include compensatory mitigation for conserving and enhancing Chinook salmon EFH. The use of compensatory mitigation is also consistent with NOAA Fisheries Southwest Region's habitat protection policy.[5]

For this EFH consultation, compensatory mitigation is defined as activities used to offset unavoidable adverse impacts on stream miles and associated habitat functions and values by restoring, enhancing or creating Chinook salmon habitat in other locations. In examining mitigation options, the agency recognizes that the proposed project action occurs within the context of other water dependent operations that can also affect water quality and quantity. Because all aspects of Central Valley water usage are interrelated and interdependent, the agency believes that reasonable opportunities for compensatory mitigation should look beyond the scope

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[3] PFMC. 1999. Identification and description of essential fish habitat, adverse impacts and recommended conservation measures for salmon. Amendment 14 to the Pacific Coast Salmon Plan. PFMC, Portland, OR.

[4] EFH regulations, 50 CFR §600.905 (b)

[5] http://swr.nmfs.noaa.gov/hcd/habitpro.pdf

of the OCAP proposed actions and consider opportunities related to other water dependent operations. That is, in order to properly mitigate, NOAA Fisheries recognizes that Reclamation may need to look beyond its own operations in order to improve the functions and values of Chinook salmon EFH by combining suggested mitigation efforts with other government programs and initiatives as well as with non-regulatory initiatives and partnerships.

The following EFH Conservation Recommendations are divided into two sections. The first deals with specific measures that Reclamation and the California Department of Water Resources (DWR) should consider to avoid and minimize adverse effects. The second section deals with conservation measures that Reclamation and DWR should consider to offset unavoidable impacts.

3.1 EFH Conservation Recommendations to Avoid and Minimize Adverse Effects:

3.1.1 Trinity River

To date restoration projects involving physically altering the riparian berms along the upper 40 miles of the Trinity River have not taken place, yet the corresponding flow increases have been implemented and will increase in the future. Fall-run Chinook salmon have experienced stranding and isolation as a result of the increased flows for the Trinity ROD.

EFH Conservation Recommendations:

3.1.1.1 NOAA Fisheries recommends that the Trinity River Mainstem Fishery Restoration Program as described in the Trinity River SEIS/EIR along with the Trinity River Record of Decision (ROD) flows be implemented. Implementing the restoration program will reduce stranding and isolation of juvenile fall-run Chinook salmon through improvements to EFH.

3.1.2 Upper Sacramento River

Fall/late fall-run Chinook salmon adults migrate up the Sacramento River in late summer through late winter(August -December). Fall-run spawn heavily in the main stem of the Sacramento River, primarily upstream of Red Bluff although a few do spawn just downstream of the Red Bluff Diversion Dam (RBDD). RBDD gates are raised during the majority of the fall-run Chinook salmon migration but some are blocked or delayed prior to September 15 when the gates are raised. The highest density spawning area occurs from the city of Anderson upstream to the first riffle downstream of Keswick Dam.

Fall/late fall-run Chinook salmon spawning the upper Sacramento River is adversely affected in all years when flows are kept high for agricultural demand (i.e., rice decomposition) and then decreased in the fall to conserve water in Shasta Reservoir. Large numbers of fall-run Chinook salmon redds have been dewatered in the upper Sacramento River when flows are lowered after

the rice decomposition program is completed and Shasta Dam releases decrease. Consequently, it is anticipated that some redd dewatering will continue in the future condition. Outmigrating Chinook salmon juveniles are also subjected to potential entrainment from several unscreened or substandard screened water diversions located along the river. These diversions adversely affect EFH by disrupting migration and rearing functions from operating properly.

EFH Conservation Recommendations:

3.1.2.1 NOAA Fisheries recommends that Reclamation, working through the appropriate CalFed program, investigate alternatives to the rice decomposition program (i.e., baling rice straw, mulching, etc.), and recommend ways of stabilizing, or increasing flows after September 30, to reduce redd dewatering.

3.1.2.2 NOAA Fisheries recommends that Reclamation encourage the Sacramento River Temperature Control Task Group efforts for managing water temperature throughout the summer in the upper Sacramento River relative to fish habitat conditions and coldwater pool storage in Shasta Reservoir to also consider the habitat needs of fall/late-fall-run Chinook salmon.

3.1.2.3 NOAA Fisheries recommends that Reclamation continue to investigate options to improve passage for all runs of chinook salmon at RBDD above that which is achieved with the current operations of gates open between May 15 and September 15.

3.1.2.4 NOAA Fisheries recommends that Reclamation facilitate the Central Valley Project Improvement Act, Anadromous Fish Screening Program, to expeditiously complete the following projects:

- the Bella Vista Water District screening system should be reviewed for efficacy;
- the unscreened water diversion for the City of Redding Municipal Water Intake;
- the unscreened pumping plants for Sutter Mutual Water Company's Tisdale, State Ranch Bend Pumping Plant and the Portugese Bend Pumping Plant;
- the Natomas Mutual Water Company's five pumping plants; and
- the Reclamation District 108 facilities at El Dorado Bend, Steiner Bend, and Rough and Ready plant.

3.1.3 Feather River

Fall-run Chinook salmon compose the largest population of salmonids in the Feather River. Unlike spring–run Chinook salmon, there is a distinct and substantial amount of in-channel spawning and rearing among fall–run Chinook salmon in the Feather River. Spawning activity begins in the low flow channel (LFC) and then gradually intensifies downstream. Typically the peak of spawning occurs about one month earlier in the LFC than in the river below Thermalito Outlet. Approximately two-thirds of the total fall–run Chinook salmon spawning occurs in the

LFC, while roughly one-third occurs below Thermalito Outlet. Due to the success of the Feather River Hatchery (FRH), large numbers of fall–run Chinook salmon spawn in the LFC of the Feather River, often over utilizing the habitat available for spawning. The significant shift in the distribution of Chinook salmon spawning in the Feather River to the upper reach of the LFC may be a major factor affecting any in-channel production of spring-run Chinook salmon resulting from redd superimposition mortality. This results in competition for spawning area in the lower Feather River. Superimposition on spring-run Chinook salmon redds by fall-run Chinook salmon is well documented (DWR 2003). Since fall-run Chinook salmon spawn later in the fall, they may destroy a significant proportion of the redds of earlier spawning spring-run Chinook salmon. This competition, and resulting superimposition of fall–run Chinook salmon redds, is most intense in the LFC where flows are predicted to remain at 600 cfs, and where the highest density of spawning occurs.

The operation of the Oroville Complex has also changed water temperatures in the Feather River. Compared to historical levels, mean monthly water temperatures in the LFC at Oroville are 2^0 to 7^0 F warmer during November through April. Release from the broad, shallow Thermalito Afterbay reservoir probably create warmer conditions than historical levels for at least part of the spring and summer. For the proposed project, water temperatures below Thermalito will be too warm for adult fall run Chinook salmon holding and spawning habitat.

Beside high water temperatures, late migrating juvenile fall run Chinook salmon may be exposed to higher predation rates due to introduced exotics (e.g. striped bass, large-mouth bass, and American Shad).

EFH Conservation Recommendations:

3.1.3.1 NOAA Fisheries recognizes the importance of providing more favorable temperature conditions below the Thermalito outlet for spawning fall-run Chinook salmon. NOAA Fisheries is currently engaged in the FERC licensing process to address temperature, flow, passage, and hybridization issues in this system. Consequently, the agency is deferring its EFH recommendations for mitigating and minimizing those effects to the FERC proceedings rather than present recommendations here that could unnecessarily limit those discussions.

3.1.3.2 DWR should consider EFH conservation by reestablishing endemic trees and other appropriate native vegetation in riparian areas; restoring natural bottom characteristics; removing unsuitable material; adding gravel to promote spawning. All of these activities should be undertaken during appropriate seasons.

3.1.4 American River

Adult fall-run Chinook salmon enter the American River in August and peak migration occurs in October although a few may show up as early as May. Spawning generally begins in late

October or early November and continues through December with a few later fish still spawning in January. Most spawning occurs in the upper 3 miles of river from Goethe Park upstream to Nimbus Dam.

The greatest EFH impact to the America River will result in loss of habitat functions from increased water temperatures and ensuing increases in water demands. Actual water deliveries will more than double from a total of 217,185 TAF to 475,000 TAF by year 2020. Future flows would be lower than under present conditions throughout much of the year due to increased diversions upstream of Folsom. The increased diversions have the potential to adversely impact the spawning habitat of fall-run Chinook salmon. Chinook salmon spawning occurs at water depths greater than 6 inches and flows need to be maintained near or above the level at which spawning occurred in order to maximize survival from egg to fry. River flow levels dropping below the level at which spawning occurs may cause stranding of redds and juvenile Chinook salmon from the initiation of spawning at about the beginning of November until juveniles have emigrated from the river, generally by end of June. While flows are expected to be adequate for fall-run Chinook salmon spawning in normal water conditions, they are projected to provide less than optimal spawning habitat during dry conditions. In fact, reductions could be as great as 700 cfs in February with the Environmental Water Account (EWA) in place, and would result in significantly less rearing habitat available in dry years, affecting juvenile fall-run Chinook salmon much more than juvenile steelhead. Concerns for flow fluctuations causing stranding of redds and juvenile fall-run Chinook salmon from the initiation of spawning to about the beginning of November is noted.

Flow fluctuations during peak spawning periods can significantly decrease egg and fish survival. Under reduce flow conditions in the upper 3 miles (where most of spawning occurs), fish tend to spawn in overlapping areas rather than extending spawning distribution downstream, resulting in redd superimposition. In order to maximize survival from egg to fry, flows need to be maintained near or above the level at which spawning occurred.

It is estimated that 1000 cfs provides 275 areas of spawning habitat; flows of 1,000 cfs or below would occur during October-November in about 20-25 percent of years. Flows in the future would be lower than under present conditions through much of the year due to increased diversion upstream of Folsom. Flows in the river could potentially be as low as 300 cfs in May under driest conditions, however, most juvenile Chinook salmon have left river by May.

Temperatures lower than 60^0 F are considered suitable for Chinook salmon spawning and egg incubation in the American River with preferred temperature being $<56^0$ F. A temperature of 56^0 F or below is best for survival of incubating eggs. Early spawning success is low if water temperature in early November is above 60^0 F. Chinook salmon fry generally emerge from the gravel starting in late December, peaking in February and continuing up through March. Nearly all leave the river as young-of-the-year before the end of June. The preferred water temperature for juvenile Chinook is 53^0 F to 57.5^0 F. Water temperatures generally exceed this range starting in April in over 50 percent of years. Fry do not spend time rearing in the river and juveniles have

emigrated from the river, generally by the end of June. Emigrating Chinook salmon are nearly all are pre-smolts suggesting that the smolting process continues downstream of lower American River into the Delta and estuary.

Increased water temperatures will certainly reduced the habitat quality for incubating and rearing fall-run Chinook salmon. The Chinook salmon egg mortality model results indicate that egg to fry water temperature-related mortality will reach or exceed 15 percent in all water years.

EFH Conservation Recommendations:

3.1.4.1 NOAA Fisheries supports efforts to adopt a more prescriptive minimum flow standard in the lower American River. The agency advises that:

a) discussions currently underway between Reclamation, members of the Water Forum, and Management Agencies for modifying Reclamation's water rights permits to effect an increase to minimum flows in the lower American Rivers be ardently pursued; and

b) flows for spawning and rearing fall-run Chinook salmon be optimized considering the needs of steelhead and other aquatic species.

3.1.4.2 NOAA Fisheries recognizes that meeting temperature objectives for steelhead during the summer and for fall-run Chinook salmon in the fall may be problematic. Conflicting demands between whether to use more cool water during the summer for steelhead rearing or holding some to increase the spawning success of Chinook in the fall will need to be reconciled. However, a temperate control management strategy/plan should be developed for extending the effectiveness of cold water management in the lower river that balances the cold water needs of steelhead during the summer months with cold water needs for returning and spawning (eggs to fry water temperature related mortalities are expected to increase) fall-run Chinook salmon during the fall months. Coordinated efforts such as temperature curtains in Lake Natomas, temperature shutters at Folsom Dam, and a new water intake for El Dorado Irrigation District to conserve the cold water pool at Folsom Dam should be vigorously pursued.

3.1.5 Stanislaus River

The Stanislaus River is the northernmost tributary in the San Joaquin River basin used by Chinook salmon. The river now supports fall-run Chinook salmon and small populations of late-fall-run Chinook salmon.

Flows are projected to be adequate for fall-run Chinook salmon spawning in nearly all years but temperatures will be warm in the lower part of the river during the early part of the adult immigration period. Under dry conditions, flows may be less than desirable for optimal outmigration prior to the VAMP period.

EFH Conservation Recommendations:

3.1.5.1 Reclamation should continue funding the development of a water temperature model for identifying optimization strategies for cold water releases from the New Melones Reservoir with consideration to fall-run Chinook salmon as well as steelhead.

3.1.6 Delta Ecosystem

Juvenile fall and late-run Chinook salmon normally migrate down from the Sacramento and San Joaquin River basins through the rich feeding grounds of the Delta, to the San Francisco Estuary and into the towards the Pacific Ocean. The suitability of the Delta migration corridor as part of juvenile salmon rearing EFH is reduced by various aspects of the proposed project. Adverse impacts to EFH may complicate normal habitat functions by extending migration routes (*i.e.*, complex channel configurations make it difficult for salmon to find their way to the ocean), increasing water temperatures, increasing susceptibility to predators, and adding direct mortality from salvage and entrainment operations.

Once juvenile salmon are in the vicinity of the SWP and CVP export water diversion facilities, they are more likely to be drawn into these facilities during water diversion operations. Water transfers would increase Delta exports from 200 TAF-600 TAF in about 80 percent of years and potentially up to 1MAF in some dry and critical years. With exports increasing in the future with the implementation of the project, and assuming that entrainment is directly proportional to the amount of water exported, the potential exist for these diversions to adversely affect the ability of outmigrating late fall/fall-run Chinook salmon to utilize the habitat as they normally would. While screening facilities allow for many fish longer than 38 mm to be salvaged , considerable mortality is believed to occur when fish are less than 38 mm. In addition, smaller fish are not screened effectively.[6,7]

Though there are efforts in place to minimize entrainment, the Tracy Fish Collecting Facility (TFCF) primary louver (screen) panels cannot be cleaned without leaving gaping openings in the screen face. Further, cleaning the secondary channel and louver panels takes the entire facility off-line. Also, during secondary louver screen cleaning operations, and secondary channel dewatering, the entire secondary system is shut down. As a result, all fish salvage is compromised for the duration of the outage. This loss in fish protection allows unscreened water to pass through the facility 25 percent of the time and results in underestimating the loss of Chinook salmon to the pumps. Also, significant delays in routine maintenance and replacement of critical control systems at the TFCF can occur. Finally, the TFCF was designed for a

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[6] Kimmerer, W. J. 2002. Physical, biological, and management responses to variable freshwater flow into the San Francisco Estuary. Estuary 25:1275-1290.

[7] Brown, R., S. Greene, P. Coulston, and S. Barrow. 1996. An evaluation of the effectiveness of fish salvage operations at the intake to the California Aqueduct, 1979-1993. *In* J. T. Hollibaugh (ed.) San Francisco Bay: The Ecosystem. AAAS, San Francisco, CA. Pp. 497-518.

maximum export rate of 4600 cfs, the rated capacity of the Tracy Pumping Plant (TPP).

With regards to the John E. Skinner Fish Facility, there is currently no standard method for reporting problems associated with the operation and maintenance of the facility. Delays in routine maintenance and replacement of critical control systems at the facility are not being reported to NOAA Fisheries, as they are experienced.

A fish barrier at the head of Old River is intended to limit the movement of both water and outmigrant Chinook salmon into Old River. The effect is to increase survival down the San Joaquin River past the Port of Stockton, where they encounter Sacramento River flows to the export facilities in the south Delta. Recent telemetry studies conducted as part of the VAMP confirm the diversion of Chinook salmon outmigrants to the CVP and SWP facilities in the south Delta (Vogel 2004[8]).

In addition, the fish barrier is again placed to improve adult Chinook salmon returns in the San Joaquin River. A recent study has found that the placement of the barrier in the fall improves the dissolved oxygen content in the Stockton ship channel, downstream to the head Old River in the San Joaquin River.[9] Having poor water quality/low dissolved oxygen in the ship channel has become a fish passage problem for returning adult salmon.[10]

The projects are now challenging the need for fish screens, based on cost, without serious consideration of impacts to Chinook salmon. At the present time, fish screening actions that are called for in both State and Federal statutes (CVPIA section 3406 (21)) are falling behind the compliance timetable in the existing CVPIA permits. So is progress to meet the "doubling goal" of the CVPIA Anadromous Fish Restoration Program.

EFH Conservation Recommendations:

Central Valley Project (Reclamation)

Delta Cross-Channel Gates

3.1.6.1 To increase the survival of out-migrating fall/late-fall-run Chinook salmon, NOAA Fisheries recommends that the DCC gates should be closed as early as possible, under an adaptive management program based on monitoring outmigrant movements, but

[8] Vogel, David A. 2004. Juvenile Chinook Salmon Radio-Telemetry Studies in the Northern and Central Sacramento-San Joaquin Delta 2002-2003. Draft Report. Natural Resource Scientists, Inc. Red Bluff, CA. January 2004.

[9] Hallock, R. J., Elwell, R.F. and D.H. Fry, Jr. 1970. Migrations of adult king salmon, *Oncorhynchus tshawytscha*, in the San Joaquin Delta. California Dept. of Fish and Game Bulletin 151. Sacramento CA. 92 p.

[10] Lee, G. F. 2003. August and September 2003 SJR DWSC Flow and DO. Report submitted to SJR DO TMDL Steering Committee, by G. Fred Lee & Associates, El Macero, CA.

no later than on December 1 of each year, unless NOAA Fisheries approves a later date. The DCC gates should remain closed for the protection of Pacific salmonids until June 15 of each year, unless NOAA Fisheries approves an earlier date. Water quality considerations in the Delta will be one cause for a request to vary from these dates.

Tracy Fish Collection Facility (TFCF)

3.1.6.2 At the TFCF, Reclamation should submit to the NOAA Fisheries for approval, one or more solutions to the problem of Chinook salmon losses associated with cleaning the primary louvers, by no later than 12 months from the date of issuance of this document. In the event that a solution is not be in place within 24 months of the issuance of this document, NOAA Fisheries recommends that export pumping at the Tracy Pumping Plant should cease during louver screen cleaning operations.

3.1.6.3 With regard to the secondary louver screen cleaning and secondary channel dewatering at TFCF, Reclamation should submit to NOAA Fisheries for approval, one or more solutions to this problem no later than 12 months from the date of issuance of this document. Should a solution not be in place within 24 months of the date of issuance of this document, NOAA Fisheries recommends that export pumping at the Tracy Pumping Plant should cease during outages of the secondary system, such as the secondary louver screen cleaning operations, debris removal and predator management programs.

3.1.6.4 Beginning on the first day of the month following the issuance of this document, and monthly thereafter, Reclamation should submit a TFCF Status Report to the NOAA Fisheries Engineering Team Leader. The report should be in a format acceptable to both parties, but should describe the status of each component of the fish salvage system, and should provide a schedule for the correction of each deficiency.

3.1.6.5 NOAA Fisheries staff (scientific and enforcement) should be permitted reasonable access to the TFCF, and its records of (i) operation, (ii) fish salvage, and (iii) fish transportation and release activities, during both announced and unannounced inspection visits. Records of research activities conducted at the TFCF are also included in this recommendation.

3.1.6.6 NOAA Fisheries recommends that Reclamation undertake ways to reduce predation on juvenile fall/late-fall-run Chinook salmon by undertaking predator removal studies at the Tracy facility and also at post-release sites for salvaged juveniles. Loss calculations should be adjusted pending results of these studies.

Tracy Pumping Plant

3.1.6.7 A plan to limit TPP exports to 4600 cfs should be prepared and implemented. This restriction should remain in place until a plan to expand the TFCF capacity is prepared, approved by NOAA Fisheries, and implemented.

3.1.6.8 Reclamation should promptly execute a renewal of the Tracy Pumping Plant Mitigation Agreement between Reclamation and CDFG, to offset unavoidable losses of Chinook salmon at the TFCF. The renewed agreement should provide for: a) An annual payment of $740,000 (adjusted for inflation (1994 to 2004) and for the current level of annual losses), as required in the last amendment of the agreement; b) Annual adjustments for facility improvements implemented by Reclamation; c) Annual adjustments for operation of the TFCF outside the criteria for the facility. Discretion provided in existing permits and agreements (such as D-1630 - Table 2) shall not be used to mask facility inadequacies and operational decisions from this adjustment; and d) NOAA Fisheries shall have review and approval over all future agreements and/or amendments for this term.

State Water Project (DWR)

JE Skinner Delta Fish Facility

3.1.6.9 Beginning on the first day of the month following the issuance of this document, and monthly thereafter, DWR should submit a JE Skinner Delta Fish Facility Status Report to the NOAA Fisheries Engineering Team Leader. The report should be in a format acceptable to both parties, but should describe the status of each component of the fish salvage system, and provide a schedule for correcting each deficiency.

3.1.6.10 NOAA Fisheries staff (scientific and enforcement) should be permitted reasonable access to the JE Skinner Delta Fish Protective Facility and its records of (i) operation, (ii) fish salvage, and (iii) fish transportation and release activities, during both announced and unannounced inspection visits. Records of research activities conducted at the facility are also included in this recommendation.

3.1.6.11 NOAA Fisheries recommends that DWR undertake ways to reduce predation on juvenile fall/late-fall-run Chinook salmon by undertaking predation management studies at post-release sites for salvaged juveniles.

3.1.6.12 NOAA Fisheries recommends that alternatives to reduce “pre-screen” losses (predation) in Clifton Court Forebay be evaluated. At minimum, the proposal to “re-connect the Forebay” downstream of the fish screens, shall be evaluated.

CVP and SWP Fish Hauling Protocols

3.1.6.13 Fish hauling runs for salmonids should be scheduled at least every 12 hours, or more frequently if required by the “Bates Table” calculations (made at each count and recorded on the monthly report).

South Delta Improvement Project

3.1.6.14 For the Head of Old River Barrier (HORB), fish barrier, NOAA Fisheries supports designing a permanent structure as proposed in the project to improve the water

quality in the San Joaquin River, which also would benefit year round fish passage of outmigrants and returning adults.

3.1.6.15 For the agricultural barriers and barrier at Old River, NOAA Fisheries recommends that all diversions served from the waterways serviced by these facilities be screened, to protect the fishery from losses caused by these diversions.

Freeport Regional Water Project, Rock Slough Intake and other Fish Screening Projects, including CVPIA-AFSP

3.1.6.16 NOAA Fisheries recommends that Reclamation ensure that the Projects (CVP and SWP) aggressively move to get the CVPIA - Anadromous Fish Screening Program fully engaged, with appropriate funding, and implement the major projects already designed.

3.1.6.17 Until the Rock Slough diversion is screened, pumping at this site should be avoided whenever Chinook salmon are detected in the vicinity of the intake. The Contra Costa Water District (CCWD) should use its two screened diversions (Los Vaqueros-Old River and Mallard Slough), and the storage in the Los Vaqueros Reservoir, to offset this restriction.

A monitoring plan, approved by NOAA Fisheries, shall be implemented, and continued until such time as the use of the unscreened Rock Slough diversion is resolved.

3.2 EFH Conservation Recommendations to Mitigate Unavoidable Impacts

As mentioned in the introductory text, NOAA Fisheries recognizes that many of the expected adverse impacts to fall and late-fall run Chinook salmon EFH cannot be avoided or adequately minimized. Consequently, the agency believes that the proposed project presents a net negative impact to EFH. NOAA Fisheries is recommending several measures that may effectively offset these impacts. They are offered in the context of the general responsibility that Reclamation has to evaluate options for improving fish mitigation.[11]

3.2.1 Water Use Efficiency

The operation of the Central Valley Project and the State Water Project is to divert, store and convey water from the southern portion of the Sacramento-San Joaquin Delta to other parts of the state consistent with applicable law require targeting known water quantities for coordinating operations. There is little doubt that all Reclamation water contracts under the Central Valley Project could benefit from improved measurement, accounting, and compliance. The accuracy of

[11] "The Secretary of the Interior is further authorized and directed to conduct feasibility investigations of opportunities to mitigate damages to or enhance fish and wildlife as a result of increasing the amount of water available for such purposes because of water conservation efforts on Federal reclamation projects" (16USC12(1)).

water diversion measurement could be improved by employing state of the art technology, as well as sufficient monitoring and calibration checks to guarantee on-going accuracy. NOAA Fisheries recommends building into the contracts incentives through water payment reductions for voluntarily adopting water conservation programs (many Districts already have programs)

EFH Conservation Recommendation:

3.2.1.1 As a means to offset potential adverse affects to EFH, NOAA Fisheries recommends that Reclamation working with appropriate CalFed programs, perform (or commission) an agricultural water-use efficiency study, using existing scientific literature and/or new research as required, to consider (but not limited to) the following questions: a) What are the current spatial and temporal irrigation patterns that dominate Central Valley agriculture?; b) What is the efficacy of current cropping patterns (those specific crops that are currently grown) under irrigated agriculture from a 'water consumption' per 'economic unit output' standpoint?; c) What would be the socio-economic and political impacts of altering Central Valley cropping patterns to promote increased water use efficiency by replacing water intensive crops (e.g.-rice) with more water-efficient crops?; d) Are Central Valley irrigation methods and procedures in accordance with the most modern knowledge and technological capabilities?; e) If new water-saving technologies or methods can be identified, how much time and money would it take to deploy them on a widespread basis in the Central Valley.

3.2.2 Fish Passage

As noted above, opportunities to avoid or minimize adverse affects to EFH in specific project area may be constrained and the potential for substantive habitat gains in these areas is minimal. Yoshiyama et al. (2001)[12] noted that the primary cause in the reduction of instream habitat for Chinook salmon has been the construction of dams and other barriers. Many of the direct adverse impacts to fall and late-fall run EFH or the indirect impacts caused by these runs to the EFH of other Chinook runs could be alleviated if fish passage were provided. In Central Valley watersheds, dams block 95% of historic salmonid spawning habitat. Additionally, non-federal FERC licensed dams account for approximately 40% of all surface water storage in the Central Valley. As a result, Chinook salmon are extirpated from approximately 5,700 miles of their historic habitat in the Central Valley. In most cases the habitat remaining is restricted to the valley floor where it was historically limited to seasonal migration use only. Remnant populations below these dams are now subject to intensive river regulation and to further direct and indirect impacts of hydroelectric operations.

EFH Conservation Recommendation:

[12] Yoshiyama, R.M., F. W. Fisher and P. B. Moyle. 2001. Historical and present distribution of Chinook salmon in the Central Valley Drainage of California. IN Contributions to the Biology of Central Valley Salmonids, Vol. 1, Randall Brown (ed.).

3.2.2.1 NOAA Fisheries recommends that Reclamation consider evaluating fish passage opportunities for late fall/fall-run Chinook salmon at all CVP dams and consider modified operations at RBDD to minimize delays in upstream migration until a permanent solution at RBDD is in place (Recommendation 3.1.2.3) . Use of Tracy Mitigation funds to restore passage and improve habitat in upstream tributaries as well as improvements in screening efficiency and transportation at the Delta fish collection facilities should be considered.

3.2.3 Increased Water Releases in San Joaquin River

Historically, the upper San Joaquin River supported spawning and rearing habitat for the southernmost stocks of fall run Chinook salmon. Since completion of Friant Dam, most of the water in the river has been diverted for agricultural and other uses, with the exceptions of releases to satisfy riparian water rights upstream of Gravelly Ford and flood releases. As a result, the reach from Gravelly Ford to Mendota Pool is often dry, does not currently support a continuous natural riparian and aquatic ecosystem, and is the reason why Chinook salmon are extirpated from the San Joaquin River above the Mendota Pool. In addition, instream flows in the balance of the San Joaquin River have been inadequate for the downstream sustenance of healthy Chinook salmon populations. One option available for mitigating unavoidable adverse effects is to restore degraded habitat to properly functioning conditions. Consequently, restoring the Upper San Joaquin River ecosystem and simultaneously improving water quality in the San Joaquin River/Delta can mitigate for impacts to fall run and late-fall Chinook salmon in other parts of the Central Valley.

EFH Conservation Recommendation:

3.2.3.1 NOAA Fisheries recommends that Reclamation should seek opportunities to restore adequate instream flows, and any necessary fish passage facilities, to restore fall-run Chinook salmon EFH on the San Joaquin River. NOAA Fisheries recommends that efforts to restore the ecosystem of the Upper San Joaquin River and its water quality should meet the objectives be coordinated within the CALFED Programmatic Environmental Impact Statement /Environmental Impact Report (PEIS/EIR) Record of Decision (ROD), which also recommended evaluating water storage in the upper San Joaquin River basin. Reclamation should take the lead on these efforts and fully coordinate with other entities involved in restoring San Joaquin flows. Reclamation should also coordinate with other efforts and actions underway on the Merced, Tuolumne, Stanislaus, Calaveras, and Mokelumne/Cosumnes rivers (Lower San Joaquin River). NOAA Fisheries finds that the above recommendation will reconnect the Upper San Joaquin River and Lower San Joaquin River, resolve the water quality problems, fish passage issue, and improve fall-run Chinook salmon habitat.

3.2.4 Merced Hatchery

Merced Hatchery was built to help mitigate for the SWP Delta pumping plant and the loss of habitat on the Merced River. There are plans by the State of California to close it.

EFH Conservation Recommendation:

3.2.4.1 If the hatchery is closed, NOAA Fisheries recommends that an equivalent amount of habitat restoration efforts, beneficial to the habitat needs of fall-run and late fall-run Chinook salmon, should be implemented and monitored. Both the habitat restoration plan and the monitoring plan shall be submitted to NOAA Fisheries for approval before implementation.

3.2.5 Monitoring

NOAA Fisheries recognizes the importance of monitoring the status of fall/late-fall-run Chinook salmon for the purpose of adaptively managing Project operations.

EFH Conservation Recommendation:

3.2.5.1 Monitoring of fall/late-fall run Chinook salmon necessary to ensure that project mitigation obligations are being met, and are not causing detrimental effects on remaining populations of aquatic organisms, to include carcass surveys, population estimates, redd surveys, and outmigrant trapping, shall be continued without interruption.

3.2.5.2 Marking of all hatchery origin fish produced for the projects shall be included in this element.

4.0 Responsibilities of Reclamation

As required by section 305(b)(4)(B) of the Magnuson-Stevens Act, Reclamation must provide a detailed response in writing to NOAA Fisheries (and to any Council commenting on the action under section 305(b)(3)) within 30 days after receiving the EFH Conservation Recommendations. The response must include a description of measures proposed by Reclamation for avoiding, mitigating, or offsetting the impact of the project on EFH. In the case that the response is inconsistent with NOAA Fisheries' Conservation Recommendations, Reclamation must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with NOAA Fisheries over the anticipated effects of the actions and the measures needed to avoid, minimize, mitigate, or offset such effects.