

ATTACHMENT A - FWS/NMFS Fish Protection Proposal

Accord + all AFRP measures	DEFT 8/5/98 Scenario	Proposed Modifications	Justification and Base Assumptions	Species and Life Stages Benefitted	Triggers and Flexibility
n/a	Positive barrier fish screen at Clifton Court Forebay; designed for 6,000 cfs at 0.20 fps screen approach velocity	Keep	Positive barrier fish screen at Clifton Court Forebay will eliminate predation in the forebay and increase fish salvage efficiencies. Approach velocity of 0.2 fps is established for delta smelt. Lower approach velocities increase opportunities for fish to escape the area of pumping plant influence and avoid the fish collection/salvage process.	All chinook salmon fry, smolts, and adults; Delta resident fish species; NOTE: Approach velocity of 0.2 fps is targeted for delta smelt adults. Delta smelt eggs and larvae are unscreenable until 20+ mm.	May be operational considerations to vary approach velocity based on fish salvage rates or hydrological conditions. (e.g. exports exceeding 6,000 cfs may be allowed up to a screen approach velocity of 0.33 fps (9900 cfs) when delta smelt are not impacted.)

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n/a	Research fish screen facility at Tracy; designed for 2,500 cfs at 0.20 fps screen approach velocity	Delete this action AND Build positive barrier fish screen designed for full Tracy pumping capacity at 0.2 fps screen approach velocity at the head of the DMC or at Clifton Court Forebay with an intertie to the Tracy Pumping Plant	Fish screen technology is currently available to complete a positive barrier fish screen at this location. Many of the proposed research objectives would be better addressed in a laboratory.	All chinook salmon fry, smolts, and adults; Delta resident fish species NOTE: Approach velocity of 0.2 fps is targeted for delta smelt adults. Delta smelt eggs and larvae are unscreenable until 20+ mm.	
n/a	2,000 cfs diversion and fish screen at Hood on Sacramento River	Delete this action	Fish screen technology is currently available to complete a positive barrier fish screen at this location. USBR's hydraulic lab in Denver can address design issues. Facility may create significant impacts to upstream migrating fish (i.e. salmon adults traveling from the Delta to the Sacramento River).		

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n/a	Joint Point	Keep	Additional pumping capacity at SWP can assist with the filling of Federal storage capacity in San Luis Reservoir during periods of low impact to fisheries	Potentially multiple species	Full use of JPOD consistent with standards in this proposal
n/a	Salvage all fish and truck to release location	Keep	Benefits of salvage differ among species and life stages. Delta smelt will not benefit from salvage efforts.	Juvenile salmon and steelhead; some resident Delta species.	Salvage rates can serve as an index of fisheries impacts and trigger operational changes in export rates
n/a	Old River enlargement in reach north of CCFB	Re-evaluate need in the context of new fish screens with low head pumping plant at CCFB	Dredging decreases value of aquatic habitat and may increase movement of fish towards pumping facilities	All salmon fry and juveniles; most delta resident fish species adversely affected.	
n/a	Operable flow control barriers or their equivalent in south Delta	Delete this action as proposed. Re-evaluate in the context of new export regime and new facilities	Barriers block fish passage and may increase movement of fish towards salvage facilities	All salmon fry and juveniles; most delta resident fish species adversely affected.	

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n/a	Mokelumne River setback levees and dredging	Keep setback levees and delete dredging.	Setback levees will allow riparian vegetation to develop on floodplain/near shore areas and improve fisheries habitat; dredging will decrease value of aquatic habitat.	All salmon fry and juveniles; most delta resident fish species.	
1962 LOD X2 AFRP Delta Action #3	1962 LOD X2	This is the same action as in the November 20, 1997 AFRP b(2) decision.	Particularly important feature for estuarine health	Most resident Delta fish species and Bay species	none

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30-day VAMP AFRP Delta Action #1	60-day VAMP	75-day VAMP from April 1 to June 15 - both flow and export components. Additional survival benefits to juvenile salmon would be realized if flows came from equal sharing across tributaries.	Impacts to San Joaquin salmon smolts will diminish under VAMP, but some losses will continue due to location of south Delta intakes. 30-day VAMP covers 45-75% of SJ salmon smolts. 60-day VAMP covers 75-90% of SJ smolts. The June period is important to SJ smolts in some years. Significant benefits to delta smelt juveniles. This action has multi-species benefits and allows for inter-annual variation in migration timing.	Spawning delta smelt; late spawning longfin smelt; late arriving winter-run salmon smolts; all Central Valley fall-run chinook salmon smolts.	Amenable to monitoring, particularly for SJ salmon smolts. The 4/1 to 6/15 time frame would be the default. Time frame could be shortened by two weeks at either end based on the absence of salmon smolts and/or delta smelt in the central Delta.
Head of Old River Barrier	Head of Old River Barrier	Head of Old River Barrier operations extended per expanded VAMP.	Substantial benefits to emigrating SJ salmon smolts.	San Joaquin fall-run salmon smolts	Same as salmon triggers for 75-day VAMP

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Delta Cross Channel gate closures based on real-time monitoring October - January AFRP Delta Action #6	Delta Cross Channel gate closures based on real-time monitoring October - January	Gate operations in October based on real-time monitoring and full closure of DCC gates between November 1 and January 31.	Larger Sacramento smolts are not easily detected in fisheries monitoring gear, thus DCC closure based on historical patterns of peak emigration periods.	Sacramento spring-run salmon smolts, Sacramento late fall-run salmon smolts; Sacramento winter-run salmon smolts.	DCC closure is triggered by real-time monitoring in October.
0.65 E/I ratio for October to January AFRP Delta Action #8	0.65 E/I for October 0.55 E/I for November 0.45 E/I for December - January	Additional measure to supplement Accord's E/I ratios and AFRP Delta actions: Initiated by the presence of Sacramento salmon smolts at the salvage facilities, maintain QWEST >0 through Jan. 31.	If Sacramento Basin smolts are detected at salvage facilities in south Delta, fish have been diverted significantly off-course and operational changes are necessary to improve net flow conditions for the remainder of the emigration period.	Sacramento Basin spring-run salmon smolts, Sacramento River late fall-run salmon smolts; Sacramento River winter-run salmon smolts; adult delta smelt.	Positive net flow (QWEST) is initiated by the detection of CWT Sacramento salmon (CNFH late fall-run or equivalent) at the salvage facilities: >0.5% of the upper Sacramento River CWT late fall-run salmon or >2.5% of the in-delta release CWT .

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<p>0.35-0.45 E/I ratio for February</p> <p>0.35 E/I ratio for March</p>	<p>0.25 E/I ratio for Feb and March</p>	<p>Replace E/I ratios for February and March with:</p> <p>(1) 10-day reduction in exports to 1,100 cfs (SWP/CVP combined) followed by a 4-day ramping period triggered by the presence of salmon fry at salvage facilities.</p> <p>(2) If the January 8 river index is <1.0 MAF, maintain QWEST at +1000; if January 8 river index is > 1.0 MAF, maintain QWEST at >0. QWEST criteria begins February 1 and remains in effect until VAMP initiated.</p>	<p>QWEST provides baseline protection which is flow based and incorporates the generally agreed upon principal that if there is more water in the Delta, more can be safely exported.</p> <p>(1) In wet years salmon fry arrive in the Delta early; SJ salmon fry are particularly susceptible to losses at the south Delta pumps. The 10-14-day reduction of exports when salmon fry densities in salvage are high will allow for dispersal away from intakes and formation of habitat associations.</p> <p>(2) Some Sacramento smolts (spring-run, late fall run, winter-run) will be in the Central Delta and require positive downstream flows for successful emigration.</p>	<p>All Central Valley fall-run salmon fry; Sacramento spring-run, late fall-run, and winter-run smolts; adult delta smelt; longfin smelt.</p>	<p>(1) Wet years are typically when salmon fry are an issue; 10-day reduction of exports initiated by salmon fry densities in salvage.</p> <p>(2) In dry years (as indicated by January 8 river index), higher proportion of Sacramento Basin salmon smolts get into Central Delta and need additional flow cues to outmigrate successfully.</p>

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0.35 E/I ratio for April, May and June AFRP Delta Actions #4 and #5	0.25 E/I ratio for April, May and June	Keep Accord's E/I ratios and AFRP Delta actions as baseline flow-based protection measure after VAMP has ended.	Accord's E/I ratios provide baseline protection which incorporates the generally agreed upon principal that if there is more water in the Delta, more can be safely exported.	All Central Valley fall-run salmon smolts, some winter-run smolts; delta smelt spawning and juveniles; striped bass.	
Outflow standards July - January: range from 3,000 to 8,000 depending on month and water year. AFRP Delta Action #7	n/a	Keep Accord's outflow standards and AFRP Delta actions when other criteria in this proposal are not controlling.	Assumes SWRCB shares responsibility for implementing standards consistent with water rights priority and watershed approach that Interior testified to in the SWRCB process. This is the basic ecological principle that applies through non-X2 controlling periods.	Multiple watershed contributions will provide important upstream benefits to steelhead and salmon for adult attraction, adult holding, spawning, incubation, rearing, and emigration while meeting minimum Delta outflows.	
0.65 E/I ratio for August - September	0.75 E/I ratio for Aug-Sept	Keep Accord's E/I ratio limits.	A larger percentage of inflow diverted may adversely effect estuarine health	Sturgeon; striped bass; late spawning delta smelt	May be limited opportunities to increase E/I ratio above 0.65.

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n/a	n/a	Better flows from Eastside streams to contribute to outflow standards and X2, particularly during spring months.	Habitat restoration in eastern Delta will have significantly greater value when supported by improved Delta inflow from Eastside streams. Some areas in eastern Delta cannot be supported by SJ or Sacramento inflows.	Salmon fry and smolts originating from Mokelumne River, Calaveras River, Consumnes River and San Joaquin Basin; delta smelt; Sacramento splittail.	
n/a	Delta habitat restoration plan	Keep DEFT 8/5/98 habitat plan	Needs more definition to fully evaluate. Likely to require all habitat measures in combination with flow actions to make this a beneficial action. Can not substitute habitat actions for flow based actions (X2, QWEST).	Salmon fry and juveniles; Sacramento splittail; striped bass; most resident Delta species	n/a
n/a	n/a	Fish screening program on San Joaquin River should be consistent with goals for the Sacramento Basin.	Sacramento Basin fish screen program has more aggressive goal - There appears to be no biological reason to afford less protection to San Joaquin River salmon.	San Joaquin salmon fry and smolts; Sacramento splittail	n/a