Using proposed NoName Group tools to minimize impacts of possible DEFT actions.

This memo attempts to identify linkages among tools of the various CalFed teams that would be the basis for building scenarios for the first seven to ten years of the CalFed program. Tools include those described in the NoName Group (NNG) Report to enhance water quality, water supply, operational flexibility, and aquatic resources. Information is drawn from the Report, from email discussions about water quality and from the evaluations of tools described in the October 22 and 29th minutes of the Diversion Effects on Fish Team (DEFT), a modified version of which is reproduced below. Some information is also drawn from the CVPIA b(2) Toolbox Committee report on tools.

This discussion is fairly broad and is offered to stimulate discussion. Matrices of tools that detail specific linked groups of actions will be ready for use by November 5.

Usefulness of various tools as triggers to protect fish from entrainment (from DEFT 10/22).

Problem	Hydro	Months	I. flex ops	II. E/I	III QWEST	IV X2	V VAMP	VI DCC	VII HOR	VIII Habitat
A. delta smelt adults	following dry years	Jan-Mar	1-2	2-3	2-3	1-3	--	--		1-2
B. delta smelt young	following dry years	Mar-Jun	2	2-3	3	1-2	1-2	--		1-3
C. spring & fall run fry	wet winters	Dec-Feb	1-2	2	2	3	--	1-2		1-3
D. fall run SJ smolts	all years	Mar-Jun	1	3	1-2	3	1	3	1	1-2 (predator control needed)
E. spring run yearlings	turbidity trigger	Nov-Jan	1-2	2-3	2-3	3	--	1		1-2
striped bass (SJ) eggs & larvae (SAC)	F. dry years or high SJ flow	Jun-Aug	1	2	1-2	2	1	--		1-2
	G. low San Joaquin flow	May-Jul	1	1-2	2	1-2	--	1*		1-3
H. steelhead	all years	Feb-May	1-2	?	3	3	1-2	--	--	3

Scoring:
-- = neutral
1 = good

2 = maybe
3 = not useful

As a first step, the following discussion focuses solely on those actions which relate to operational changes and which were given, by at least some of the participants a score of one. Habitat improvements are likely to improve survival and growth of many species that use the delta. Some parties believe that habitat restoration obviates much of the concern surrounding entrainment effects. Some DEFT members contend that if the delta is a more habitable environment for fish, fish will be less likely to move toward the pumps, or they will survive salvage better, or there will be a sufficiently large population that entrainment effects on the population will be negligible. This memo addresses only those actions to reduce entrainment that are linked to changes in operations at water project facilities in the delta, including flow management, salinity control, export reduction, and closure of barriers. This memo does not attempt to say whether such actions are necessary.

Separate from these entrainment effects, improvements of general estuarine conditions have been recommended by DEFT through extending X2 conditions to 1962 LOD for the March through June period. Currently X2 is set at 1971.5 LOD by the SWRCB WQCP and at 1962 LOD for March through June in the statement by DOI on implementing CVPIA. If included in the chosen CALFED scenario, this recommendation would supercede both earlier statements and could affect the tools chosen for entrainment reduction of delta smelt adults and young.

IA. Protecting adult delta smelt in Jan-Mar in winters following dry years. This probably represents a reduction in pumping to minimal levels for 14-21 days.

1. Wet present conditions. If carryover storage is high or storms have already occurred that suggest that San Luis will fill regardless of a 21 day curtailment, then no tools are necessary. To what extent do the JPOD and a relaxation of the Corps criteria on the SWP increase the likelihood of filling? Can we identify the levels of carryover storage north and south of the delta that would prevent this operation? Can we identify January and February forecasts that would be compatible with this operation?
2. Dry present conditions. If carryover storage is low or the January/February forecasts are lower than average it may be that additional reductions in pumping cannot be made up by later pumping. In this case, environmental water stored south of the delta could reduce the impact of this action. This would be a very uncommon event and would help define some possible groundwater storage rules or define some purchase options.
3. Drought conditions. If carryover storage and dry conditions result in years when pumping from the delta is occurring under balanced conditions and pumping is not expected to be at full capacity for part of the year then it should require no new tools to move the period of minimal pumping into the period of adult delta smelt

arrival in the south delta.

Or

IVA. Protect delta smelt populations by improving conditions for young in years when adults may be lost in greater numbers to entrainment.

1 following dry years X2 conditions are improved in order to improve delta hydrodynamics and habitat conditions in Suisun Bay. This could be accomplished through manipulations of exports or through increased releases north of the delta. In either case the impacts would be less intensive but of greater duration. Water purchases north or south of the delta could be used to achieve this goal. Analysis for CVPIA have estimated their total package to result in an overall change of approximately 33 TAF in critical years (-202 TAF CVP + 169 TAF SWP). If JPOD was used first to pump all excess federal inflow, the state's operations could be unaffected and the remaining 33 TAF could come from a variety of tools.

IVB. Same as IVA.

Or

VB. Expansion of VAMP conditions beyond its nominal May 15 end date in order to improve delta hydrodynamics and reduce entrainment of delta smelt spawned in the south delta. Exceedance of the red light has generally happened due to the high take of young of year delta smelt in late May and early June.

1. Increased flows could be achieved through release of water from San Luis or Delta Mendota Canal via the Newman wasteway or other drainage facilities. In its easiest form this water could be replaced later with increased exports via the JPOD and lifting of Corps criteria, either before or after the period of release. Simultaneous recapture of the increased San Joaquin flows is probably not desirable form both an environmental and water quality perspective, although it is not precluded. In years when such make-up operations are not possible, water purchases from south of delta contractors or use of previously stored groundwater dedicated to environmental purposes could compensate. Such drawing from groundwater would be more likely to occur following dry years so that filling groundwater storage before April after dry years should be given a high priority. This would require coordination with IA above.
2. Any increased flows from eastside reservoirs would have to avoid exacerbating delta salinity problems at other times of year. Tools for achieving such a goal would seem to be limited to purchase of Friant water or trading Friant releases for Arvin-Edison groundwater storage or deliveries to Friant-Kern through the Cross-Valley Canal. Trading water exported from the delta in exchange for increased releases from Hetch Hetchy would be another way to augment Vernalis flows, but would require a balancing of water quality concerns.
3. Decreased export rates after May 15 are unlikely to be recoverable afterwards because they occur after the usual filling date of San Luis. Pre-banking of environmental water is possible in years when San Luis is not expected to fill, but

in other years reduced exports could only be compensated via purchases, transfers, demand reduction via water use efficiency programs, or replacement water drawn from environmental water stored south of the delta. Ground water has been the tool most often suggested to provide environmental storage, but this kind of operation which would store and withdraw water in most years might be expensive and incompatible with groundwater operations described at IA. Alternatively, surface storage through reoperation of San Luis or, in the long-term, via something like the expansion of Pacheco Reservoir could provide substantial storage for water pumped earlier to allow reduced pumping later in the same year.

IC and VIC Flexible operations and early closure of the DCC to protect fry in the delta following early storms. Usually the kinds of conditions that bring fry into the delta also lead to closure of the DCC, and thus provide an automatic improvement in protection for those fish. Some reduction in exports may be desirable even with the DCC closed, but the problem is most acute if flows drop off sharply before fry have left the delta.

1. Reduced exports at this season probably need to be long but gentle, at their most severe these limitation might be to limit exports to no more than Vernalis or QWEST flows. These export reductions would occur at the start of the new delivery season so that, in many years, it may be possible to cheaply purchase interruptible supplies left over from the previous year. Especially since this problem occurs in years with heavy winter storms, such interruptible supplies are likely to be cheap and available. Is this likely to be adequate?

ID, IIID, and VIID. Management of delta hydrodynamics to protect a greater portion of outmigrating San Joaquin smolts outside of the VAMP period. On average about 35% of the SJ smolts are believed to migrate outside of the April 15 to May 15 window. These actions contrast with VD (below) which would extend the period of VAMP conditions to cover more of the outmigration period.

1. Reduction of exports at times when real-time monitoring indicates that San Joaquin smolts are at risk would probably result in an occasionally sporadic operation of SWP and CVP pumps in the times leading into and following the VAMP period. Historic salvage data is difficult to use to assess how often such curtailments might be necessary, because the salmon salvage is not reliably separated by stocks. Despite that, the data from sampling at Mossdale suggests that the duration and intensity of salmon movements vary strongly from year to year and that in many years few San Joaquin salmon would be at risk for at least part of the March-June period. The present E/I ratio is most likely to constrain operations in the months of May and June, especially in drier years when smolts are probably most at risk. Protection of outmigrant salmon smolts might be consistent with allowing higher than WQCP pumping on days when no salmon are found at Mossdale, further water supplies could be generated by relaxation of the Corps criteria at this time.

2. Management of QWEST to no less than 0 is thought by some to maintain adequate environmental cues to guide successful smolt outmigration. Construction of a screened 2000 cfs intake at Hood would augment QWEST directly by 2000 cfs. In the period after May 20, opening of the DCC would also raise the level of exports that could occur without causing negative QWEST values. Augmentation of San Joaquin flows through the tools discussed above would also directly augment QWEST and provide reduced impacts to water exports.

VD. Extension of VAMP conditions onto either or both sides of the VAMP period, as suggested by monitoring in the SJ tribs. Without having the results of the VAMP experiment it is difficult to say whether flow improvements or export reductions would be more protective, extension of VAMP conditions could include only the flow conditions, only the export conditions or both. Depending on hydrology and water supply conditions it may be more desirable or easier to manipulate one rather than another. This tool differs from flexible operations (ID) by using upstream monitoring to trigger a broad, general condition in the delta.

1. Tools and concerns regarding VAMP conditions are discussed at VB.

IE. Flexible operations to protect outmigrating spring-run yearlings. These fish are believed to transit the delta rapidly, and probably in a fairly well-defined peak following a sudden turbidity or flow rise. Emphasis has been laid in the spring-run plan of protection, and elsewhere, on keeping these migrants in the Sacramento River mainstem and providing clear environmental cues toward the ocean. Such cues may include net flow effects or salinity that can be affected by the water projects, but may also include tidal phenomena or other global effects outside the influence of the water projects. Much discussion of possible water project impacts has centered on analysis of data relating to QWEST.

1. Spring-run yearlings from Deer and Mill Creek move through the delta for 2-3 weeks sometime in November-January. Intensive monitoring has been performed at the mouths of these streams in recent years and related monitoring in the mainstem Sacramento River has been used to identify when these fish arrive in the delta. Some parties have suggested that management of export rates to ensure a positive QWEST for 14-21 days following the arrival of these fish at Knights Landing would facilitate their successful migration. At this season QWEST is often positive, especially after the kind of storm event that triggers outmigration. Relaxation of the Corps criteria in the days preceding the arrival of these fish at Knights Landing would reduce any water supply impact of maintaining a positive QWEST after their arrival. Use of a joint point of diversion and relaxation of the Corps criteria during the wet season would greatly reduce the impact of any protective action occurring early in the water year. Long-term storage of groundwater for environmental purposes could protect against the few years when JPOD and relaxation of the Corps criteria were inadequate to make-up water

supplies lost. Pre-pumping of water before the arrival of spring-run would require coordination with the needs of and salmon fry residing in the delta (see IC).

VIE. Closure of the DCC. The present plan of protection for spring-run calls for closure of the DCC whenever monitoring shows them to be in the vicinity of Knights Landing. Closure of the DCC during low flow conditions can result in water quality concerns in the central delta. Closure of the DCC also immediately and substantially reduces QWEST, putting this action in conflict with IE if exports are kept constant.

1. Opening and closing of the DCC at this season is dealt with in depth in the current spring-run plan of protection and in discussion of the b(2) delta actions.
2. Construction of a screened intake at Hood is a tool that is unique to the CalFed discussions. This diversion would augment QWEST by 2000 cfs,without regard to the status of the DCC.