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A 30-yr "Ecosystem" Restoration
Package for the San Joaquin
River Drainage (Salmon/Steelhead
focus)

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Delta Program "Ecosystem
Restoration" Committee on 6/4/96

The following draft table summarizes preliminary cost estimates of consensus-based salmon/steelhead restoration actions in the San Joaquin River Drainage within several key categories over thirty years. The actions listed are primarily "physical" habitat improvements intended to enhance salmon production by reshaping, contouring or in some way modifying the existing bed or banks of river habitats.

Streamflow improvements greater than the annual "water purchase" proposed by the CALFED Bay-Delta Program (200,000 AF) are not listed as actions here. However, it is my belief that flows exceeding the current minimum requirements on the east-side tributaries (including the recent Tuolumne River Settlement Agreement and the Merced River Agreement now under negotiation) are needed to maintain more healthy levels of Chinook salmon production on regular intervals, and obtain the full benefit of the listed actions. We may find over time that some of these negotiated flows and the "200,000 AF" proposal are one and the same- that is, they do not add up to more than 200,000 AF. Permanent changes in minimum streamflow are most likely to occur through administrative or legal hearing processes rather than through consensus under the CALFED Bay-Delta Program. It is unclear how long and if the "200,000 AF" action would remain at that level over time as administrative or legal actions result in permanent improvements in minimum instream flows. This needs further discussion.

The barrier at the Head of Old River is not listed in the draft table of ecosystem restoration actions. In my view, the biological data available to define the fishery benefits or impacts and the operational criteria are not well enough defined. As currently described, the barrier could be opened or closed as need be throughout the emmigration period of San Joaquin Fall-run Chinook migrations, yet its anticipated benefit to salmon is tied to the direction of greater flow down the San Joaquin River past Stockton. An on-again-off-again or partial operation of the barrier may actually be worse for San Joaquin salmon. Studies in the Delta are just beginning to focus on salmon movement patterns and mortality factors in relation to water operations and habitat conditions in South Delta channels. It is conceivable that the Head of Old River Barrier may become a useful restoration action in the future once the benefits and operational strategies (rules) are more defined.

If implemented, the draft table of actions would generally complement each other and be further enhanced by any coincident streamflow improvements over the thirty year period. It is probable that the combined affect of these actions on salmon production would make significant progress, if not meet, the State and Federal salmon restoration goals for this drainage.

The draft table of actions, as modified by input and consensus, may represent a reasonable "Ecosystem Restoration" package for the San Joaquin River drainage upstream of Vernalis

for purposes of the "core" and "essential" actions common to all Alternatives in the CALFED Bay-Delta Program. Other features of the Alternatives may provide improvements in streamflows or operational improvements that further enhance the benefits of the "physical" actions.

The following draft table estimates the one-time Design and Construction costs and the annual Operating and Maintenance over thirty years for improvements in seven major action categories. Note that adding the columns across for each action will not equal the amount in the "total" column due to the expansion of O/M costs over thirty years. A one percent (1%) "O/M" factor based on the "D/C" was used for most of the actions. For example:

An action costing \$1,000,000 to design and construct would incur a 1%/yr O/M cost and over thirty years the total project cost would be \$1,300,000. This protocol was used to avoid the inability to maintain the value of the projects constructed over time.

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Actions	(X \$1,000)				(X \$1M)
	Merced	Tuolumne	Stanisl.	SJR	Total
Physical Habitat					
floodplain redr.	5,050	10,100	5,050	10,100	39.0
pred. isolation	15,150	12,120	6,060	-	42.9
gravel recr/repr	3,030	4,040	4,040	-	14.3
revegetation	505	1,010	505	2,020	5.2
stranding reduc.	1,010	1,010	1,010	1,515	5.9
					116.1
68.7					
Fish Screens					
gravity	2,222	-	-	-	2.9
pumps	2,020	2,020	2,020	16,160	31.3
					34.2
Water Temp. Mgt.					
natural habitat	30,300	-	30,300	-	78.0
hatchery	503	-	-	-	0.5
					78.5
Water Purchase	4,000	2,000	4,000	-	300.0
Hatchery Supple.	1,530	20,400	2,020	-	47.5
Monitoring	450	450	450	375	51.8
Educ./Public Use	227	652	227	227	8.1
			Est. Total		636.2

Percentage Cost Estimate by Action Category

Physical Habitat	18.2%
Fish Screens	5.4%
Water Temp. Mgt.	12.3%
Water Purchase	47.2%
Hatchery Supplem.	7.5%
Monitoring	8.1%
Public Educ./Use	1.3%
	100.0%

Assumptions:

1. Habitat project costs based on recent estimates for predator isolation projects, gravel projects and the number and sizes of problem areas.
2. Over 400 small diversion in the basin, assumes 50.trib. @ \$50K ea. plus replacement of the 4 large screen (SJR) and the 7 riparian screens on the Merced.
3. Temp control devices @ Exchequer/McSwain and Melones/Tulloch, plus chillers @ MRH
4. 200TAF/yr @ \$50 AF apportioned 40% Merced, 20% Tuol., 40% Stanisl.
5. Construction/operation of Tuol. River Hatchery, incr. CWT holding cap. @ MRH, spawning/imprinting sta. on Stanisl.
6. Three-level monitoring for all CVPIA programs, benefits assessments for water purchases, screens, pulse flows or other operations. Monitoring for "management level" decisions
7. Public education and use are crucial to continuance and support of long term program. Strong school-site programs, educational center @ Tuolumne River Salmon Restoration Center, public/angler access improvements. Public "Ownership" in program.