

**Implementation Strategy and Priorities for
Bay Delta
Ecosystem Restoration**

I. INTRODUCTION

The mission of the CALFED Bay-Delta Program (CALFED) is to develop a long term comprehensive plan to restore ecosystem health and improve water management for beneficial uses of the Bay-Delta System. CALFED's Ecosystem Restoration Program goal is to "improve and increase aquatic and terrestrial habitats and improve ecosystem functions in the Bay-Delta to support sustainable populations of diverse and valuable plant and animal species". The Ecosystem Restoration Program Plan (ERPP) is still in the development stage, however basic restoration objectives have been agreed upon.

The Ecosystem Roundtable was established to provide CALFED with input on coordination of ecosystem restoration activities and on the selection of projects and programs to be funded from state, federal, and stakeholder Category III funds.

This implementation strategy is being prepared primarily to guide the selection of projects and programs from Category III. At the discretion of individual CALFED agencies, they can also use it to increase coordination of priorities for other funding sources.

With the passage of Proposition 204, state funding is now available to augment stakeholder contributions to Category III. There is also an expectation that federal funds will be available in FY 98. Stakeholders have agreed that Category III actions should be consistent with CALFED's ERPP. Therefore, restoration priorities need to be established for the allocation of those funds which are consistent with the objectives of the ERPP. On December 13, 1996 the Ecosystem Roundtable tentatively recommended that the priorities for allocating ecosystem restoration resources should be (1) aquatic species that are listed, of special concern, or desirable and in "greatest need", and (2) habitat types that have experienced the greatest decline, and which are important to the priority species. The Roundtable emphasized an interest in funding habitat demonstration projects that can increase the understanding of large scale ecosystem restoration processes. Using the ERPP as a guiding document, this draft paper identifies the rationale for setting near term restoration priorities, and then identifies the restoration priorities based on that rationale. Criteria are also included that will help guide selection of actions to address the priority species and habitat types.

II. RATIONALE FOR IDENTIFYING NEAR-TERM RESTORATION PRIORITIES

The rationale that were used to select species and habitat types is as follows:

- CALFED Mission. Focus on species and habitat whose restoration will result in the greatest progress towards achieving the CALFED mission to restore ecological health and improve water management for beneficial uses of the Bay-Delta System. Aquatic species and those habitats supporting aquatic species would be priorities based on this criteria.
- High Risk. Focus on high risk species and habitat --listed species and habitats in decline.
- Ecosystem Benefits. Focus on habitats that provide the broadest benefits to priority species and to the ecosystem.

III. HABITATS

Habitat types that have experienced the greatest declines and which provide the broadest ecosystem benefits and/or benefits to the priority species include the following:

1. *Tidal perennial aquatic habitat (freshwater)*.
Description. Includes shallow aquatic habitats, particularly less than 9 feet deep from mean high tide.
Priority rationale: This habitat type has declined dramatically in the Delta. It provides habitat for many fish and wildlife species, and contributes to the primary and secondary productivity of the foodweb in the Delta. Implementation of pilot projects would allow restoration techniques to be refined. Experience restoring this type of habitat has been limited and there are several key questions related to benefits it may provide for salmon rearing in the Delta that need to be answered as part of the larger ERPP.
Examples: Projects already underway include Prospect Island.
Key species: Delta smelt, salmon, wildlife and plant species in the following guilds: shorebird and wading-bird guild, waterfowl guild, freshwater emergent wetlands plant association.
2. *Seasonal wetland and aquatic (emphasis on seasonal floodplain habitat)*
Description: Includes habitat within the floodplain which is inundated seasonally during high flood water.
Priority rationale: This habitat type provides seasonal habitat for aquatic species such as splittail spawning and salmon rearing and for wildlife species such as waterfowl and shorebirds. It also provides functions such as nutrient cycling and foodweb support. Seasonal floodplain habitat have been greatly reduced by levee construction and changes in hydrology. Restoration of seasonal floodplain habitat can also provide opportunities for riparian forest restoration using natural processes. There is a large body of knowledge regarding restoration of fairly intensively managed seasonal wetlands, but there is relatively little expertise available on the technique of using natural floodplain processes to restore wetlands. There are also questions related to feasibility and interactions with flood control operations that could be addressed through pilot projects.

Examples: The Yolo Bypass, the Cosumnes River Preserve/Watershed, and Stone Lakes Wildlife Refuge.

Key species: salmon, splittail, waterfowl and wading birds, giant garter snakes, and for the areas where riparian restoration can accompany seasonal floodplain wetlands, species such as western yellow-billed cuckoo, Swainson's hawk, sandhill cranes, riparian wildlife guild, and neotropical migratory bird guild.

3. *Shaded riverine aquatic habitat*

Description: Includes riparian habitat adjacent to or overhanging streams and rivers.

Priority rationale: This habitat type provides food and escape cover for out migrating salmonid juveniles and is an important source of nutrients in the streams and delta sloughs. Much of this habitat type along the major rivers and in the delta has been lost due to river channelization, levee construction and maintenance, and the invasion of exotic flora. Shaded riverine aquatic habitat can be restored in two ways, through restoration on existing levee berms and through restoration of natural processes by modifying flood control facilities such as with levee setbacks. In giving this habitat type priority, the focus should be on restoration using natural river processes with habitat restoration on existing levee berms occurring only where natural process restoration is precluded.

Examples: Sacramento River Refuge/SB 1086, Cosumnes River Preserve

Key species: Salmonids, other riparian dependent species.

4. *Saline emergent wetlands (tidal)*

Description: Includes tidal brackish and saltwater wetlands.

Priority rationale: This habitat type supports several listed plant and animal species and is important for nutrient cycling and foodweb support functions. It has also declined due to diking and reclamation of bay lands.

Examples: There are several restoration projects in the North Bay and Suisun Bay.

Key species: Salt marsh harvest mouse, Suisun song sparrow, California clapper rail, and for some of the restoration projects in the North Bay which restore natural salinity gradients at creek mouths, this type of restoration can be important for aquatic species such as splittail and striped bass.

5. *Midchannel islands and shoals*

Description: Includes the channel islands in the Delta.

Priority rationale: These midchannel islands actually represent diverse habitat types including shoals, tidal mudflats, tule marshes, shaded riverine aquatic, and riparian scrub habitat. These habitat remnants are a high priority for protection and restoration because collectively they comprise a significant fraction of the remaining natural habitat in the Delta, they continue to be threatened, and they are one of the few habitat areas in many areas of the delta where habitat restoration opportunities have not been complicated by subsidence.

Examples: Staten Island midchannel island project

Key species: Delta smelt, salmon, shore bird and wading-bird guilds, and waterfowl guild.

6. *North Delta agricultural wetlands and perennial grasslands*

Description: Includes agricultural lands seasonally flooded and perennial grassland habitat

Priority Rationale: Agricultural wetlands and perennial grasslands in the north Delta, may also need to be included because they provide opportunities for restoration of seasonal floodplains and tidal perennial aquatic habitat due to the limited amount of subsidence that has occurred. These habitat types in the north delta are rapidly being converted to vineyards which could preclude opportunities for restoration in the future.

Examples: Stone Lakes Wildlife Refuge, ?

Key Species: These habitat types in this area currently provide foraging habitat for waterfowl, Swainson's hawks, and sandhill cranes. Any future restoration of these lands would incorporate the existing terrestrial and avian wildlife benefits as well as provide benefits to aquatic species such as Delta smelt, and salmon.

IV. *PRIORITY SPECIES OR POPULATIONS*

Species or populations that are at the greatest risk of decline and whose recovery contributes the greatest to the CALFED mission include the following aquatic species that are listed, are being considered or are likely to be considered for listing, or aquatic species with high recreational value and in serious decline.

- San Joaquin River fall run chinook salmon
- Winter-run chinook salmon
- Spring-run chinook salmon
- Delta smelt
- Splittail
- Steelhead trout
- Green sturgeon
- Striped bass

1. *San Joaquin River fall-run chinook salmon:* The chinook salmon is an important native anadromous sport and commercial fish with important ecological value. The fall-run race on the San Joaquin River is designated as a species of concern by USFWS.
2. *Winter-run chinook salmon:* The chinook salmon is an important native anadromous sport and commercial fish with important ecological value. The winter-run race is listed as endangered under the state and federal Endangered Species Acts.

3. *Spring-run chinook salmon:* The chinook salmon is an important native anadromous sport and commercial fish with important ecological value. The spring-run race on the Sacramento River is designated as a closely monitored species by DFG and a species of concern by USFWS.
4. *Delta smelt:* The delta smelt is a native estuarine resident fish that has been listed as threatened under the state and federal Endangered Species Acts.
5. *Splittail:* The Sacramento splittail is a native resident fish that is proposed for listing under the federal Endangered Species Act and a candidate for listing under the State Endangered Species Act. The Sacramento splittail also supports a small winter sport fishery in the lower Sacramento River.
6. *Steelhead trout:* The steelhead trout is an important native anadromous sport fish of high recreational and ecological value that is proposed for listing under the federal Endangered Species Act.
7. *Green sturgeon:* The green sturgeon is designated as a species of special concern by DFG and a species of concern by USFWS.
8. *Striped bass:* The striped bass is an important non-native anadromous sport fish with high recreational value. It also plays an important role as a top predator in the aquatic system.

V. *PHYSICAL AND ECOSYSTEM PROCESSES*

The CALFED ERPP is based on the premise that restoration of ecological processes and functions is a fundamental tool for successful ecosystem restoration. These natural processes serve to create and maintain habitats needed by fish, wildlife and plant communities. Restoration efforts based on restoration of natural processes are likely to be more cost effective in the long term because they should be self sustaining and require less human intervention. Restoration of processes such as hydrologic regime are also important if habitats such as tidal, perennial, and shaded riverine aquatic are to function. This premise will also be a basis for the early implementation program.

As watersheds are evaluated to identify limiting factors which may be affecting the priority species, they will be evaluated to determine the status of important ecological processes and functions. Where these processes have been interrupted or altered so the needed habitats are no longer being provided, the feasibility of restoring those processes will be evaluated. If the processes can be restored through early implementation actions, those actions will be given preference. Where it is not feasible in the short term to restore the natural process, care will be taken to ensure that short term restoration actions do not preclude long term restoration of the processes. Where it is clear that the natural process cannot be restored, it may be necessary to take restoration actions that replace or supplement the natural process, knowing that these will be on-going annual maintenance types of programs. For example, if a major diversion blocks the

only source of sediment to a salmon spawning area and it is not feasible to restore gravel recruitment through natural processes, it may be necessary to artificially place gravel in the system on a regular basis.

VI. GEOGRAPHIC DISTRIBUTION OF PRIORITIES

The geographic distribution of the five habitat types and the eight species or population priorities are shown in Table 1 and 2. Using these habitat types and species as priorities will result in a fairly broad geographic distribution of projects and resources. Therefore, no additional geographic priorities have been established at this time.

Table 1. Geographic Distribution of Priority Habitat Types						
	North Bay	Delta	Sacramento	Sacramento Tributaries	San Joaquin	San Joaquin Tributaries
Tidal Freshwater		x				
Seasonal floodplain wetlands	x	x	x		x	
Shaded Riverine	x	x	x	x	x	x
Saline Tidal/emergent	x					
Mid-channel islands		x				

Table 2. Geographic Distribution of Priority Species Likely Actions to Address								
	North Bay	Delta	Sacramento	American	Feather/Yuba	smaller tributaries	San Joaquin	San Joaquin Tributaries
San Joaquin Fall Run		x					x	x
Winter Run		x	x					
Spring Run		x	x		x	x		
delta smelt	x	x	x					

splittail	x	x	x				x	x
steelhead	x	x	x	x	x	x	?	?
green sturgeon	x	x	x					
striped bass	x	x	x				x	

VII. CRITERIA

In addition to the rationale for identifying the priority species and habitats (see pg 2), criteria have been identified to address technical and policy objectives. These criteria are summarized in Table 3. They will be used to guide selection of actions to address the priority species and habitats.

Table 3. Draft Criteria List for Selection of Restoration Actions

1.	Restoration actions should not prejudice the selection of alternatives in CALFED's Programmatic EIR/EIS.
2.	Restoration actions should be consistent with CALFED mission, solution principles, goals, and objectives.
3.	Restoration actions should be amenable to evaluation and documentation of effects.
4.	Restoration actions which also benefit other CALFED program objectives for the Bay-Delta should receive additional priority.
5.	Restoration actions which provide both short-term and long-term benefits should be emphasized over actions which provide only short-term benefits.
6.	Restoration actions should emphasize restoration of natural processes and functions where possible.
7.	Restoration actions should address the elimination or reduction of limiting factors for priority species.
8.	Restoration actions which benefit a suite of species that includes listed species should be emphasized over actions that benefit any single priority species.
9.	Restoration actions for key species should not compromise other desirable species.
10.	Demonstration projects should be emphasized to reduce the uncertainty associated with the success of restoration actions, such as of ecosystem processes.
11.	Restoration actions that foster partnerships, collaboration, and/or information exchange should be encouraged.