Alternative 11

CALFED
BAY-DELTA
PROGRAM

Alternative 11 - Summary

Through-Delta Conveyance Improvement

Emphasis

Reduce the cross-Delta diversion of Sacramento fish. Provide more reliable and higher-quality water supply from the Delta by increasing through-Delta conveyance

Distinguishing Features

This alternative is intended to provide a **moderate** level of resource improvement and conflict resolution.

Physical/Structural	Operational/Management	Institutional/Policy
• Construct a screened intake on the Sacramento River near Hood • Improve north Delta channels by dredging, levee reinforcement, and gradient-control facilities to maximize Delta conveyance capacity • Moderate level of habitat restoration in the Delta and the Sacramento and San Joaquin Rivers to improve the ecological reliability of the Delta • Moderate level of levee improvements • New screened intake at Italian Slough	• Real-time monitoring to reduce fish entrainment • Obtain 100,000 AF of San Joaquin River water and manage for environmental purposes • Pollutant source control for urban, industrial, agricultural, and mine discharges • Modify Clifton Court Forebay operations to reduce entrainment	• Funded levee improvements, emergency management plan, and landside buffer zones to reduce system vulnerability • Permit approval allowing pumping flexibility

Benefits

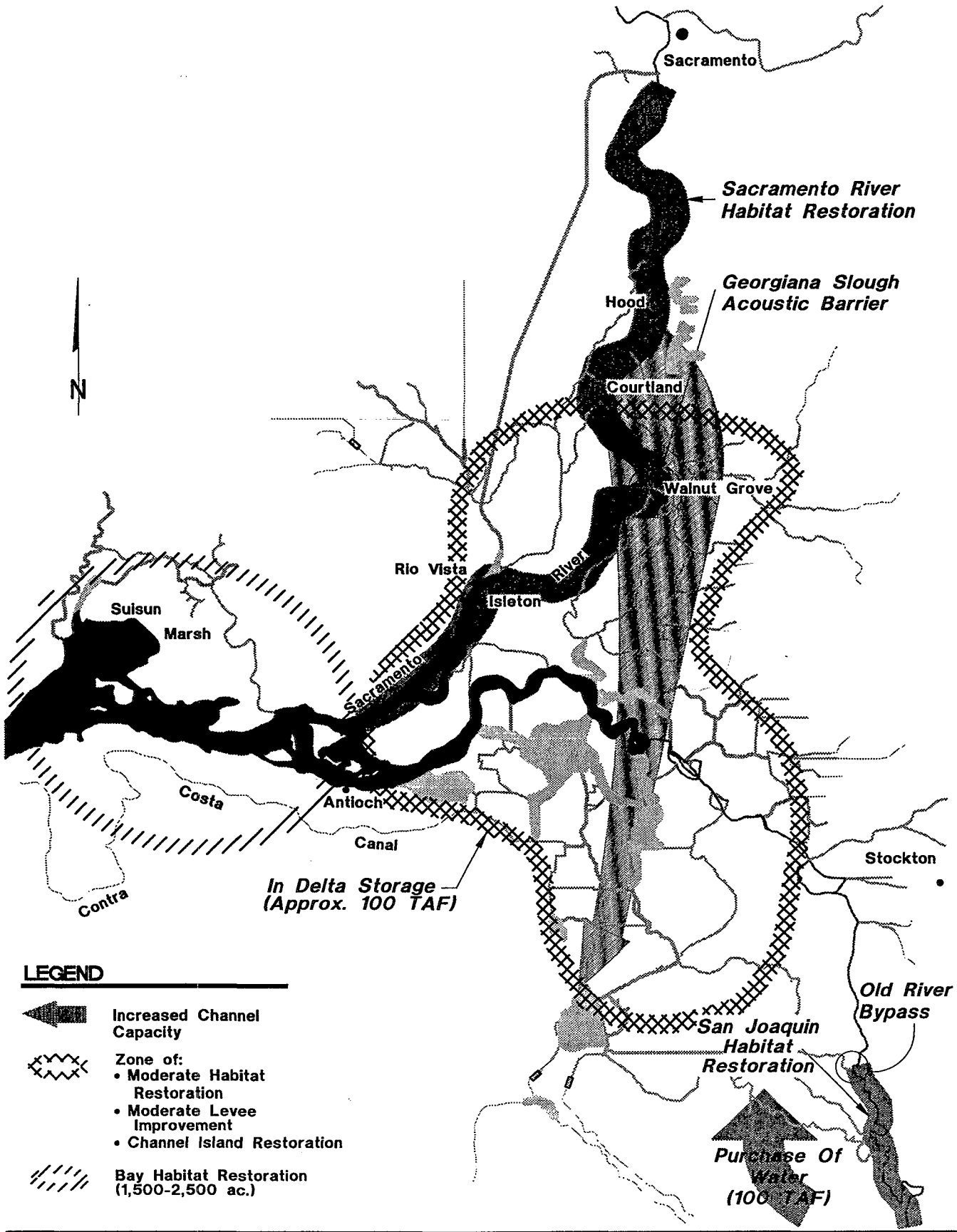
- Improves quality of Delta water
- Moderately improves the quality and quantity of Delta habitat and decreases loss of anadromous and Bay-Delta fish
- Improves water supply flexibility and reliability
- Moderately reduces vulnerability of Delta land uses and water supply

Constraints and Concerns

- Continues loss of fish and fish habitat associated with Delta diversions
- Larvae of some important fish species remain vulnerable to entrainment
- Screens along Sacramento River may increase predation
- Water quality in the south Delta may not improve sufficiently

Through Delta Conveyance Improvement

Alternative 11



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CALFED BAY-DELTA PROGRAM

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Alternative 11
Through-Delta Conveyance Improvement

Overview

North Delta
South Delta

This alternative relocates the diversion location for Delta exports to a new screened facility on the Sacramento River and expands the flow capacity of some existing north Delta channels to improve water flow through the Delta. The alternative would reduce fish entrainment impacts, improve the quality of some export water, and improve flows in the south Delta.

improved through Delta conveyance

At present, water from the Sacramento River is diverted into the Delta through the Delta Cross Channel and Georgiana Slough, both of which are unscreened. Water moves through the Delta to the pumping plants in the south Delta. High fish mortality results from the diversion of fish from their natural migration routes in the Sacramento River into the central Delta, reverse flows in Delta channels which provide improper cues to migratory fish, and entrainment at the pumps.

reduce fish mortality with new screened diversion location

This alternative would reduce fish mortality rates by screening the new intake on the Sacramento River and eliminating reverse flows by improving the efficiency of flow through the Delta and increasing the permitted export pumping facility. A new intake facility with state-of-the-art fish screens would be constructed on the Sacramento River near Hood, providing a fresher source of water and keeping fish in the Sacramento River. Fish screens would also be constructed on moderate and high priority diversions in the Delta and on upstream rivers and tributaries. Improvements to Delta channels would improve the efficiency of water flow to the south Delta pumps and would reduce or eliminate reverse flows in the channels.

how?

how?

expand flow capacity of some existing channels

fish screens on moderate and high priority diversions

New water storage dedicated for environmental purposes will be created in the Delta. This facility would be filled when water was available. Water would be released from this facility to improve fish transport in the Delta or to flush fish away from the pumps to allow diversions to continue. Real-time monitoring would be used to avoid fish entrainment. Water for environmental purposes would be purchased from San Joaquin River users to be used for fish transport and to improve south Delta water quality. Delta and Sacramento water quality would also be improved by reductions in pollutant discharges from agricultural, municipal, industrial, and mine sources. Retirement and fallowing of agricultural land with drainage problems will increase available water supplies while reducing pollutant discharges.

100 TAF of new environmental water storage in Delta

improved water quality through pollutant source control

This alternative restores habitat in the Sacramento River downstream from Sacramento and restores channel features to improve survival of anadromous fish on the San Joaquin River. This alternative also restores aquatic and riparian habitats along Delta levees, restores shallow riverine and riparian habitat along Delta channels, and creates tidal wetlands in Suisun Bay. Delta levees will be improved to a moderate level, and will incorporate habitat restoration activities.

moderate levels of levee protection

1,500 to 2,500 acres of tidal

A stable funding source for levee maintenance would be established, and an emergency levee management plan would be established and funded.

wetlands in Suisun Marsh

By screening a new intake, improving flows through the Delta and using acquired and stored water, this alternative improves export and south Delta water quality, increases water supply reliability and reduces fish mortality.

improved conditions for all four objective areas

Physical and Structural Features

Habitat Restoration

Activities	Benefits
• Restore riparian, shaded riverine, and shallow water habitat along the **Sacramento River channel** between Sacramento and Collinsville	• Provides substantial improvement in aquatic habitat as well as improvements in water supply reliability and water quality • Increases survival and spawning success of anadromous and Delta native fish
• Restore **Delta and floodway corridor** shallow water, riparian, terrestrial, and tidal wetland habitat	• Provides spawning areas for Delta native fish and forage areas and escape cover for juvenile salmon, Delta smelt, splittail, and other species. Provides improvements in water supply reliability and water quality
• Restore approximately 75 to 125 miles of shallow water, riverine, and riparian habitat along **Delta levees**	• Provides spawning areas for Delta native fish and forage areas and escape cover for juvenile salmon, Delta smelt, splittail, and other species. Provides improvements in water supply reliability and water quality
• Restore and protect **channel islands** from erosion and enhance habitat	• Provides habitat for aquatic and terrestrial plant and animal species • Improves water quality
• Restore about 1,500 to 2,500 acres of tidal wetlands in **Suisun Bay**	• Provides wet year spawning habitat for Delta smelt, rearing areas for salmon, and wildlife habitat (e.g. canvasback and redhead ducks)
• Restore riverine channel features in the **San Joaquin River** above the Delta to lower water temperature and to protect young fish from predation and straying	• Improves fish survival

Considerations
• **Sacramento River Channels** – Feasible and cost-effective habitat restoration implemented between Sacramento and Collinsville.
• **Delta** – Candidate areas for shallow water habitat restoration include Prospect Island, Liberty Island, Little Holland Tract, Hastings Tract, Yolo Bypass, and the southeast Delta. Candidates for Delta levee habitat restoration include Twitchell Island along Threemile Slough and Sevenmile Slough, Georgiana Slough, and the North and South Forks of the Mokelumne River.
• **Floodway Corridors** – Habitat restoration must not impair capacity of floodways.
• **Suisun Bay** – Convert diked wetlands or create tidal wetlands with dredge spoils between Collinsville and Carquinez Strait.
• **San Joaquin River** – Confine wide, shallow channels and isolate in-channel gravel quarry areas. May not be self-sustaining.

Water Transport

Activities	Benefits
• Construct a **new, screened diversion** point for a portion of export supplies on the Sacramento River upstream of the Delta	• Reduces entrainment of fish during export diversion
• Increase Eastside channel flood flow capacity	• Increases flood flow routing capability and flexibility • May improve shaded riverine aquatic habitat

Considerations
• Diversion sized to transport up to 12,000 cfs.
• Diversion at a location upstream of the Delta such as near Hood or Freeport.
• Use best available screening technology and real-time monitoring to minimize fisheries impacts.
• Eastside channel improvements would focus on Mokelumne River but also include channels such as Cosumnes River and Deer Creek.

Water Storage

Activities	Benefits
• Develop about 100,000 AF of **new water storage** in the Delta dedicated to environmental uses	• Provides additional diversion flexibility • Reduces entrainment of fish • Reduces frequency and duration of export curtailments, thus improving water supply reliability • Improves fish transport through the Delta • Could significantly improve response time (compared to Folsom and Shasta reservoirs) for releasing water for improved management of X2

Considerations
• Locate new environmentally dedicated Delta storage reservoir near export pumps on one or more islands such as Bacon, Mandeville, or Victoria.
• Divert water during November, December, and January; release water from March to July as needed. With real-time monitoring, divert when species of concern are not present and release water to move fish or release for diversion.
• Environmentally dedicated water storage in the Delta allows reduction in diversions during critical periods.
• Creation of a wide riparian and shallow water habitat corridor around the perimeter of Delta island storage would provide additional fish and wildlife benefits.

Fish Protection and Transport

Activities	Benefits
• Construct a **San Joaquin River bypass** at the head of Old River	• Encourages outmigrating fish to stay in San Joaquin River • Allows for managing flows down Old River
• Install **fish screens** on moderate and high priority diversions in the Delta, rivers, and tributaries	• Reduces entrainment of fish
• Construct new screened State Water Project intake at **Italian Slough**	• Avoids fish predation and entrainment in Clifton Court Forebay when diversion rates are low
• Improve drainage in **floodway corridors**	• Reduces fish stranding
Considerations	
• Select diversions for screening according to criteria including size of intake, location, peril to fish, and screening feasibility.	

Flood Protection and Levee Stabilization

Activities	Benefits
• Provide a **moderate level of protection and stabilization** of Delta levees through levee maintenance and stabilization actions	• Manages vulnerability of Delta land use and infrastructure • Manages vulnerability of Delta water supply to salinity intrusion • Manages vulnerability of Delta ecosystem functions • Provides opportunities for habitat restoration
• **Improve flood conveyance capacity** of Delta channels through channel maintenance and improvements	• Manages vulnerability of Delta functions • Improves flood conveyance • Provides opportunities for habitat restoration

Considerations
• Provide flood protection equivalent to Army Corps of Engineers PL 99 standard for these islands: All critical western islands such as Jersey Island. Islands with important regional infrastructure (e.g., Highway 12) such as Terminous Island Islands with both valuable habitat and important regional infrastructure (e.g., transmission lines) such as Lower Roberts Island. • Upgrade all other Delta levees to meet at least the Hazard Mitigation Plan (HMP) standards. • Integrate protection and stabilization of levees with Delta habitat restoration activities. • Provide stable funding mechanism for ongoing levee and habitat monitoring, maintenance, and management. • Improvements to channels include dredging for sediment removal in channels with restricted flood capacity.

Operational and Management Features

Water Diversion Management

Activities	Benefits
• Acquire about 100,000 AF of water from willing sellers in the **San Joaquin basin**	• Transports fish through San Joaquin River and Delta • Improves water quality • Improves management flexibility for diversions to reduce fish loss
• **Improve CVP and SWP operations** through predation control, coordinating operations, and improving fish salvaging and handling	• Reduces fish losses
• Improve **real-time monitoring** of locations of fish species of special concern and modify water diversions to avoid fish entrainment	• Provides an additional tool to help reduce entrainment of special-concern species • Improves flexibility to divert water during critical fish migration periods
• Evaluate, improve, and install **behavioral barriers** for anadromous fish	• Diverts anadromous fish from areas of potential entrainment and predation • Allows for continued water diversions at current locations

Considerations
• Can use San Joaquin environmental water for pulse flows for fish transport or diluting poor quality flows • Coordinate use of San Joaquin environmental water with the operation of new Delta storage to improve timing of diversions • Evaluate continued use of an acoustic barrier at the mouth of Georgiana Slough. • Evaluate behavioral barriers for Delta Cross Channel and Threemile Slough.

Fisheries Management

Activities	Benefits
• **Mark salmon** produced in hatcheries	• Facilitates selective catch of hatchery salmon by commercial and recreational fisheries
• Conduct **net-pen rearing of striped bass** to supplant natural production	• Maintains recreational fishery • Reduces operational constraints on water diversions
Considerations	
• Actions are intended to maintain recreational and commercial fisheries as well as enhance native salmon stocks. • Need to assess impact of incidental mortality on native (unmarked) fish.	

Water Quality Management

Activities	Benefits
• Increase enforcement of source control regulations for **agricultural drainage** and implement farming best management practices for water quality	• Improves Delta water quality
• Increase enforcement of source control regulations for **urban and industrial runoff** and implement best management practices for water quality	• Improves Delta water quality
• Integrate existing **land retirement and fallowing** programs for agricultural lands with drainage problems	• Improves Delta water quality
• Integrate existing and support appropriate on-site **mine drainage remediation** measures to the maximum extent feasible	• Improves Delta water quality
Considerations	
• Identify priority pollutant sources such as Iron Mountain Mine and west-side San Joaquin agricultural lands. • Provide regulatory and institutional incentives for implementation of remediation measures.	

Institutional and Policy Features

Habitat Programs

Activities	Benefits
• Integrate recommended **habitat restoration actions from other programs**, including CVPIA and the Anadromous Fish Restoration Program	• Provides additional habitat restoration
• Establish programs to **preserve agricultural land uses** that provide valuable habitat functions	• Protects existing habitats

Activities	Benefits
• Establish a CALFED team to coordinate and **expedite habitat restoration permits**	• Accelerates acquiring permits for environmental restoration projects and other CALFED projects
• Establish and fund a management program and rapid response team to **manage introduced species**	• Protects existing valuable species and habitat
• Establish a program to identify and use clean **dredge materials** from the Delta for habitat restoration and levee maintenance in the Delta	• Provides materials for habitat and levee improvements
• Encourage farmers and levee maintenance districts to **leave habitat areas undisturbed** by working with resource agencies	• Protects existing habitats • Increases flexibility in maintenance programs
Considerations	
• Coordinate activities to avoid duplication.	

Water Management

Activities	Benefits
• Increase exports during periods of high winter Delta flows and when environmental concerns are low	• Increases supply predictability by shifting a large portion of diversions away from environmental sensitive periods that currently constrain pumping activities • Provide export water quality benefit
Considerations	
• Regulatory changes would be required to increase winter exports. Could include trade off pumping incentives for higher diversion during acceptable winter months and reduction in exports during more environmentally sensitive periods. • Would require increase in permitted capacity (to physical capacity) of Delta export facilities to maximize benefit of export criteria modification in conjunction with additional off-stream storage south of the Delta.	

Water Quality Standards

Activities	Benefits
• **Reevaluate Delta export/inflow ratios** during triennial reviews as habitat effectiveness is realized	• Allows for higher level of water transfer as fishery populations improve
Considerations	
• Monitor to verify effectiveness of habitat and entrainment reduction programs. Develop an adaptive management program to modify habitat restoration and export/inflow ratios in response to improved sustainability of important species.	

Management of System Vulnerability

Activities	Benefits
• Establish and fund an **emergency levee management plan** to respond to levee failures	• Provides resources to protect Delta functions through proactive and preventative measures
• Establish **landside buffer zones** adjacent to levees on islands with deep peat soils	• Provides increase in stability of Delta levees and reliability of Delta functions by reducing subsidence adjacent to levees • Could be used to provide habitat benefit
Considerations	
• Determine extent and cost effectiveness of levee management programs and buffer zones. • Buffer strip approximately 100 to 150 yards wide dedicated to shallow wetlands.	

Preliminary Assessment

Benefits

- Improves quality of Delta water
- Moderately improves the quality and quantity of Delta habitat and decreases loss of anadromous and Bay-Delta fish
- Moderately reduces vulnerability of Delta land uses and water supply
- Improves water supply flexibility and reliability

Constraints and Concerns

- Continues loss of fish and fish habitat associated with Delta diversions
- Screens along Sacramento River may increase predation
- Water quality in the south Delta may not improve sufficiently
- Larvae of some important fish species remain vulnerable to entrainment