Alternative 18

B-001270

Alternative 18 - Summary

Delta Protection with Storage

Emphasis

Combine key levee and channel improvements, in-Delta and San Joaquin Valley storage, habitat restoration, and flow barriers to achieve moderate reductions in levee system vulnerability, improvements in Delta aquatic and terrestrial habitat, and equitable water supply flexibility. Water is purchased for environmental management.

Distinguishing Features

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

Physical/Structural	Operational/Management	Institutional/Policy
• Moderate level of levee improvement • New storage in the Delta and in the San Joaquin Valley to increase water supply flexibility • Moderate level of habitat restoration in the Bay, the Delta, and in the Sacramento and San Joaquin Rivers • New screens on moderate and high priority diversions • New screened intake at Italian Slough	• Manage reservoirs to improve water quality • Real time management to reduce entrainment • Obtain 100,000 AF on San Joaquin River and manage for environmental purposes • Groundwater banking and conjunctive use to improve water supply flexibility • Water conservation, reclamation, acquisition, and desalination to increase stream flows	• Pollutant source controls and enforcement for agricultural drainage, establish water quality BMPs, pest control, and remediate on-site mine drainage • Funded levee improvements, emergency management plan, and landside buffer zones to reduce system vulnerability

Benefits

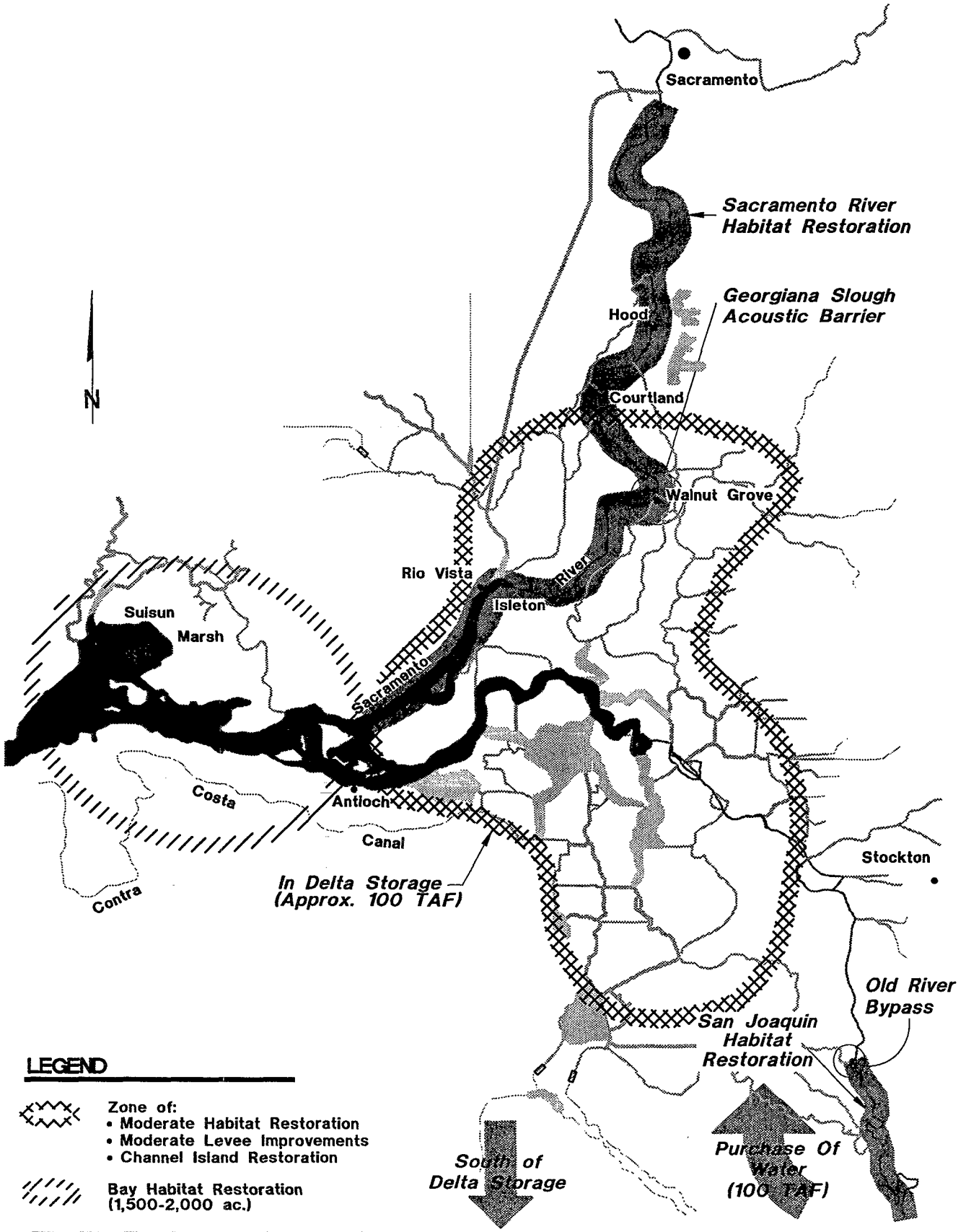
- Improves ecosystem quality through habitat restoration and improved flows from storage
- Moderately improves of in-Delta and export water quality
- Funded levee management program significantly decreases vulnerability of Delta functions to catastrophic failure
- Improves operational flexibility through storage and purchases

Constraints and Concerns

- Fish mortality in the south Delta remains significant
- Export supplies remain highly constrained and vulnerable to interruption
- Some Delta islands remain vulnerable to flooding
- Ability to fill new reservoirs may be highly restricted by pumping restrictions
- Habitat restoration may not provide relief from pumping restrictions

Delta Protection with New Storage

Alternative 18



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CALFED BAY-DELTA PROGRAM

B—001272

B-001272

Alternative 18
Delta Protection With Storage

Overview

Delta protection and new storage

This alternative emphasizes improved system reliability by upgrading levees, improving maintenance, and increasing the flow capacity of some existing north Delta channels. This will provide improved flood protection. Additional water storage is created in the Delta to provide environmental benefits and south of the Delta to improve water supply reliability.

water storage for environmental purposes

This alternative improves Delta levees to a moderate level of flood protection and provides a plan and stable funding source for levee maintenance and an emergency levee response. New water storage in the Delta dedicated for environmental purposes would be filled when water was available and real-time monitoring would be used to avoid fish entrainment. Water would be released to improve fish transport in the Delta, flush fish away from the pumps to allow diversions to continue, or manage Delta salinity levels. Additional off-stream storage would be created along the west side of the San Joaquin Valley to store water diverted from the Delta during times of high water availability.

fish screens and water quality protection

Fish screens will also be constructed on high and moderate 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 could reduce reverse flows in Delta channels. 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 and reclamation and conservation programs would decrease demand for Delta water and improve water quality.

Delta habitat restoration

Because pumping in the south Delta would continue, habitat restoration would be concentrated in other parts of the Delta. This alternative would restore habitat on the Sacramento River downstream from Sacramento and restore channel features on the San Joaquin River to improve survival of anadromous fish. This alternative also restores a variety of aquatic and riparian habitats along Delta levees, restores shallow riverine and riparian habitat along Delta channels, and creates tidal wetlands in Suisun Bay.

By providing increased protection of Delta islands, improving flows through the Delta, and constructing new storage facilities, this alternative will improve system reliability. The use of acquired and stored water will also enhance the reliability of supplies while improving south Delta water quality and reducing fish mortality.

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 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
• Construct new off-stream storage south of the Delta with approximately 0.5 to 1.0 million AF	• Provides additional storage and operational flexibility for supply, quality, and the environment

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 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

Activities	Benefits
• 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.

Water Supply Management

Activities	Benefits
• Provide incentives for conjunctive use for the Sacramento and San Joaquin River basins to provide 300-500,000 AF of annual supply	• Provides for increased transferrable supplies
• Expand **water conservation** best management practices (BMPs) and implement and expand efficient water management practices (EWMPs)	• Reduces demand for water from Delta
• Implement feasible **reclamation and reuse** projects for urban and agricultural supplies	• Reduces demand for water from Delta
• Integrate land retirement and land fallowing programs with existing programs such as CVPIA and San Joaquin Drainage Program	• Reduces demand for water from the Delta • Improves water quality • Increases flexibility of water supplies

Considerations

- Possible state and federal cosponsorship for conservation and reclamation programs.
- Institutional needs to improve water transfers.
- Land retirement and land fallowing will focus on marginal agricultural lands and lands from willing sellers.
- Conjunctive use programs to prevent over-draft and water quality degradation.

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 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 regulatory 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 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 ecosystem quality through habitat restoration and improved flows from storage
- Moderately improves of in-Delta and export water quality
- Funded levee management program significantly decreases vulnerability of Delta functions to catastrophic failure
- Improves operational flexibility (storage and purchases)

Constraints and Concerns

- Fish mortality in the south Delta remains significant
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