Alternative 1

CALFED
BAY-DELTA
PROGRAM

Alternative 1 - Summary

Reduce Delta Diversions with Demand Management

Emphasis

This alternative improves Bay-Delta water reliability and ecosystem health by reducing water use upstream, in the Delta, and in export areas. The alternative modifies the timing of diversions and provides basic improvements in habitat, water quality, and levee vulnerability.

Distinguishing Features

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

Physical/Structural	Operational/Management	Institutional/Policy
• Basic aquatic and wetland habitat restoration in the Delta, Suisun Bay, and upstream • Fish screens on high priority diversions • Fish management barriers at Georgiana Slough and Old River • Basic level of levee improvements	• Intensive real-time monitoring and shifting timing away from the spring period • Modification of Clifton Court Forebay operations to reduce entrainment	• Aggressive urban and agricultural conservation • Substantial investment in water reclamation • Conjunctive use programs • Land retirement and fallowing • Extensive use of market mechanisms to facilitate water transfers • Pollutant source control to improve water quality • Funded levee improvements, emergency management plan, and landside buffer zones to reduce system vulnerability

Benefits

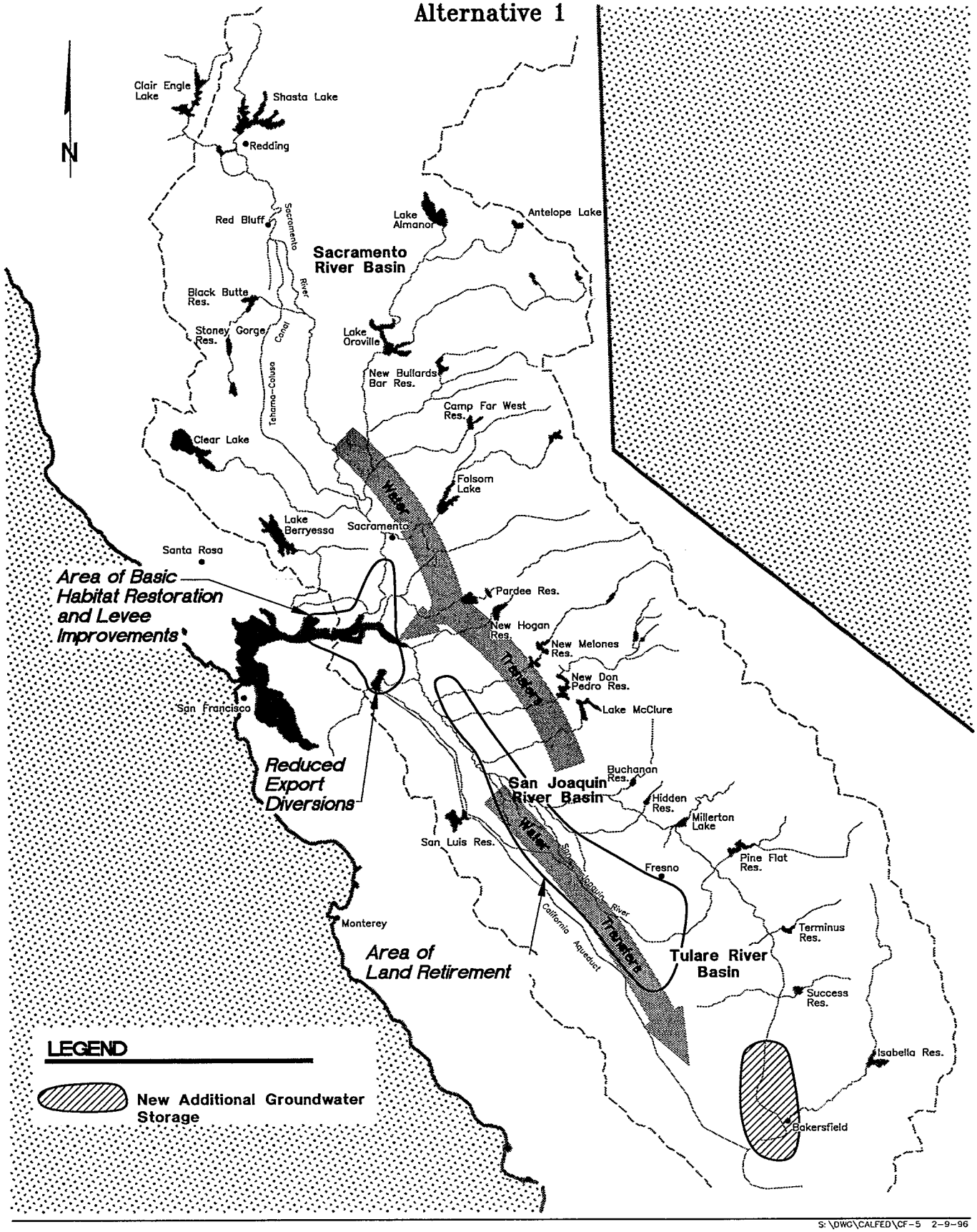
- Improves physical habitat and Delta outflows in spring and slightly reduces fish mortality caused by operations
- Reduces mass loading of pollutants
- Provides basic improvement for Delta levees and land uses
- Slightly improves reliability of export supplies by increasing fish populations

Constraints and Concerns

- Fish mortality in south Delta export facilities remains high
- Some Delta islands remain vulnerable to flooding and water supplies remain vulnerable to interruption
- In-Delta and export water quality remains problematic
- Long-term ecosystem benefits uncertain
- Export supplies and transfer opportunities remain highly constrained
- Substantial agricultural land retirement or fallowing possible
- Significant new facilities may be required in water use areas
- Adverse hydrological conditions continue in Delta due to south Delta exports

Reduce Delta Diversions with Demand Management

Alternative 1



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CALFED BAY-DELTA PROGRAM

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Alternative 1
Reduce Delta Diversions with Demand Management

Overview

reduce fish entrainment by decreasing diversions

This alternative reduces fish entrainment losses by decreasing diversions from the Bay-Delta watershed. Demand management actions will produce substantial water savings, expanding supply flexibility. Total Delta export volume will be reduced, allowing increases in spring Delta outflow to benefit fish transport and enhance ecosystem productivity. This alternative also includes basic levels of habitat restoration and actions to improve levee reliability and water quality.

demand management saves water

Various demand management methods including water conservation, water reclamation, and land retirement will be employed to sustain supplies for existing water users and provide alternative supplies for other users. An aggressive program of urban "Best Management Practices" and agricultural "Efficient Water Management Practices" will save approximately 500,000 to 1 million acre-feet of water per year. Substantial water reclamation investments will produce approximately 2 million acre-feet of new urban water supplies. Finally, approximately 800,000 acres of land would be permanently retired, reducing evapotranspiration by over 2.5 million acre-feet per year in normal water type years. Land retirement would focus on marginally productive lands, especially those that contribute substantially to regional drainage and water quality problems.

shift diversions away from environmentally sensitive periods

To allow Delta diversions to be shifted away from the spring (February-June) period, this alternative includes actions to increase conjunctive use and groundwater banking in the southern San Joaquin Valley. In addition, market mechanisms and incentives will be used to facilitate water transfers. Groundwater storage will be filled in wet periods and withdrawn in dry periods, sustaining water supplies to users during dry periods without increasing fish entrainments. To further reduce entrainments at existing diversion locations, fish screens will be installed on high priority diversions throughout the Bay-Delta system, behavioral fish-movement barriers, or equivalent structures will be operated at the head of Old River and Georgiana Slough, and export forebay operations will be modified to reduce fish losses at the export pumps.

basic level of habitat restoration

This alternative includes basic habitat restoration both upstream and in the Delta. Suisun Bay tidal wetlands will be restored to provide habitat for Delta smelt and salmon. Levees will be rebuilt to improve flood protection and increase the extent of shallow water, riverine, and riparian habitats. These actions will focus on islands considered critical for water quality and having both regional infrastructure facilities and valuable habitat. Delta water quality will be addressed through the standard set of core actions.

By continuing use of existing water management facilities in combination with substantial reduction in demands for Delta exports, this alternative increases fish populations and environmental quality while simultaneously sustaining water supplies.

increases fish populations while sustaining water supplies

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	• Improves aquatic and wetland habitat quality and ecosystem productivity • Increases survival and spawning success of anadromous and Delta native fish
• Restore **Delta** shallow water, riparian, terrestrial, and tidal wetland habitat	• Provides spawning areas for Delta native and resident fish as well as 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 as well as forage areas and escape cover for juvenile salmon, Delta smelt, splittail, and other species. Provides improvements in water supply reliability and water quality
• Protect **channel islands** from erosion and enhance habitat	• Provides habitat for aquatic and terrestrial plant and animal species • Improves water quality
• Restore about 750 to 1,250 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)

Considerations

- **Sacramento River Channel** –Feasible and cost-effective habitat restoration implemented between Sacramento and Collinsville.
- **Delta** – Candidate areas include Prospect Island, Liberty Island, Little Holland Tract, Hastings Tract, Yolo Bypass, and the southeast Delta. Candidate areas for Delta levee habitat restoration include Twitchell Island along Threemile Slough, Sevenmile 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.

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 environmentally 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 out-migrating fish to stay in the San Joaquin River • Allows for managing flows down Old River
• Install **fish screens** on highest priority diversions in the Delta, rivers, and tributaries	• Reduces entrainment of fish
• Operate barriers to fish movement into Georgiana Slough	• Reduces entrainment of salmon outmigrants in central and south Delta

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 **basic 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
• **Maintain flood conveyance capacity** of Delta channels through channel maintenance actions or in conjunction with levee stabilization	• Manages vulnerability of Delta functions • Maintains flood conveyance • Provides opportunities for habitat restoration

Considerations

- Provide flood protection equivalent to Army Corps of Engineers PL 99 standard for these islands:

  Critical western islands with important regional infrastructure (e.g., Highway 160) such as Sherman Island

  Islands with both valuable habitat and important regional infrastructure (e.g., I-5) such as New Hope Tract
- 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.

Operational and Management Features

Water Supply Management

Activities	Benefits
• Expand groundwater storage and conjunctive use supply programs	• Provides flexibility needed to respond to operational requirements for changing timing of diversions • Allows shifting of exports away from February-June period critical for fish
• Modify timing of reservoir releases	• Improves Delta water quality through dilution and salinity repulsion and improved instream aquatic habitat benefits
• Expand to high level of water conservation best management practices (BMPs) and implement and expand efficient water management practices (EWMPs)	• Reduces demand for water from the Delta

Activities	Benefits
• Include **inclining block rates** • Include measurement of agricultural deliveries and **water pricing structures** to encourage efficient water use • Maximize **wastewater reclamation** programs • Possible use of **gray water** for urban landscape irrigation • Maximize use of **reclaimed wastewater** for agricultural purposes • Maximize retirement of marginal agricultural lands from willing sellers • Maximize potential for temporary land fallowing (such as rotational fallowing) • Facilitate water transfers	• Reduces demand for Delta water • Could make water available for drought-year transfer • Enhances reliability of water supplies
Considerations	
• Use real time monitoring for reservoir releases to improve water quality and ecosystem flow management. • Coordinate surface water releases with groundwater storage releases. • Possible state and federal cosponsorship for conservation and reclamation programs • Land retirement and land fallowing will focus on marginal agricultural lands and lands from willing sellers.	

Water Diversion Management

Activities	Benefits
• Improve **real-time monitoring** to determine locations of special-concern fish species and modify water diversions to reduce fish entrainment	• Provides an additional tool to help reduce entrainment of special-concern species
• **Improve CVP and SWP operations** through predation control, coordinating operations, and improving fish salvaging and handling	• Reduces fish losses
Considerations	

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
• Implement on-site **mine drainage remediation** measures based on requirements in current regulations	• Improves Delta and Sacramento River water quality
Considerations	
• Identify priority sources and provide regulatory and institutional incentives for implementation.	

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
• Establish a CALFED team to coordinate and **expedite habitat restoration permits**	• Accelerates acquisition of 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

Activities	Benefits
• 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 of effort.	

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
Considerations	
• Determine extent and cost effectiveness of levee management programs and buffer zones. • Buffer strip approximately 75 to 100 yards wide dedicated to shallow wetlands.	

Preliminary Assessment

Benefits

- Improves physical habitat and Delta outflows in spring and slightly reduces fish mortality caused by operations
- Reduces export vulnerability to fish intake and slightly improves reliability of export supplies
- Provides basic improvement for Delta levees and land uses
- Reduces mass loading of pollutants

Constraints and Concerns

- Fish mortality in south Delta export facilities remains significant
- Long-term ecosystem benefits uncertain
- In-Delta and export water quality remains problematic
- Export supplies and transfer opportunities remain highly constrained
- Adverse hydrological conditions continue in Delta due to south Delta exports
- Delta islands remain vulnerable to flooding and water supplies remain vulnerable to interruption
- Substantial agricultural land retirement or fallowing possible
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