Alternative 10

Delta Island Protection and Small Isolated Facility

E-008930

Alternative 10

Delta Island Protection and Small Isolated Facilities

Emphasis

Reduce diversion effects on fish by constructing a small, isolated conveyance facility from the Sacramento River to the export pumps.

Distinguishing Features

Physical and Structural Features

Major physical features include a small (5,000-7,000 cfs) isolated conveyance facility. Improves all Delta levees (project and non-project) to minimum level of protection equivalent to the hazard mitigation plan (HMP) to reinforce the existing physical configuration of the system against catastrophic failure. Other Delta infrastructure is provided with a level of flood protection equivalent to Public Law (PL) 99 standards. Habitat restoration in the Delta and the Sacramento and San Joaquin Rivers. A moderate level of habitat restoration to improve the ecological reliability of the Delta.

Operational and Management Features

Diversion point would be relocated to a point on the Sacramento River near the north edge of the Delta. Pumping for diversion can occur at any time as long as real-time monitoring is used to avoid fish entrainment. Obtain 100 TAF on San Joaquin River and manage for environmental purposes.

Institutional and Policy Features

Benefits

- Reduce the loss of fish to the SWP diversion pumps
- Improve circulation in the Delta increasing aquatic habitat productivity
- Improve SWP water quality due to new diversion location
- Reduce SWP pumping restriction associated with fish entrainment
- Eliminate the vulnerability of catastrophic failure of export water supplies
- Decrease vulnerability of Delta functions to failure
- Improve Delta habitat quality
- Improve Delta water quality by managing drainage and discharge

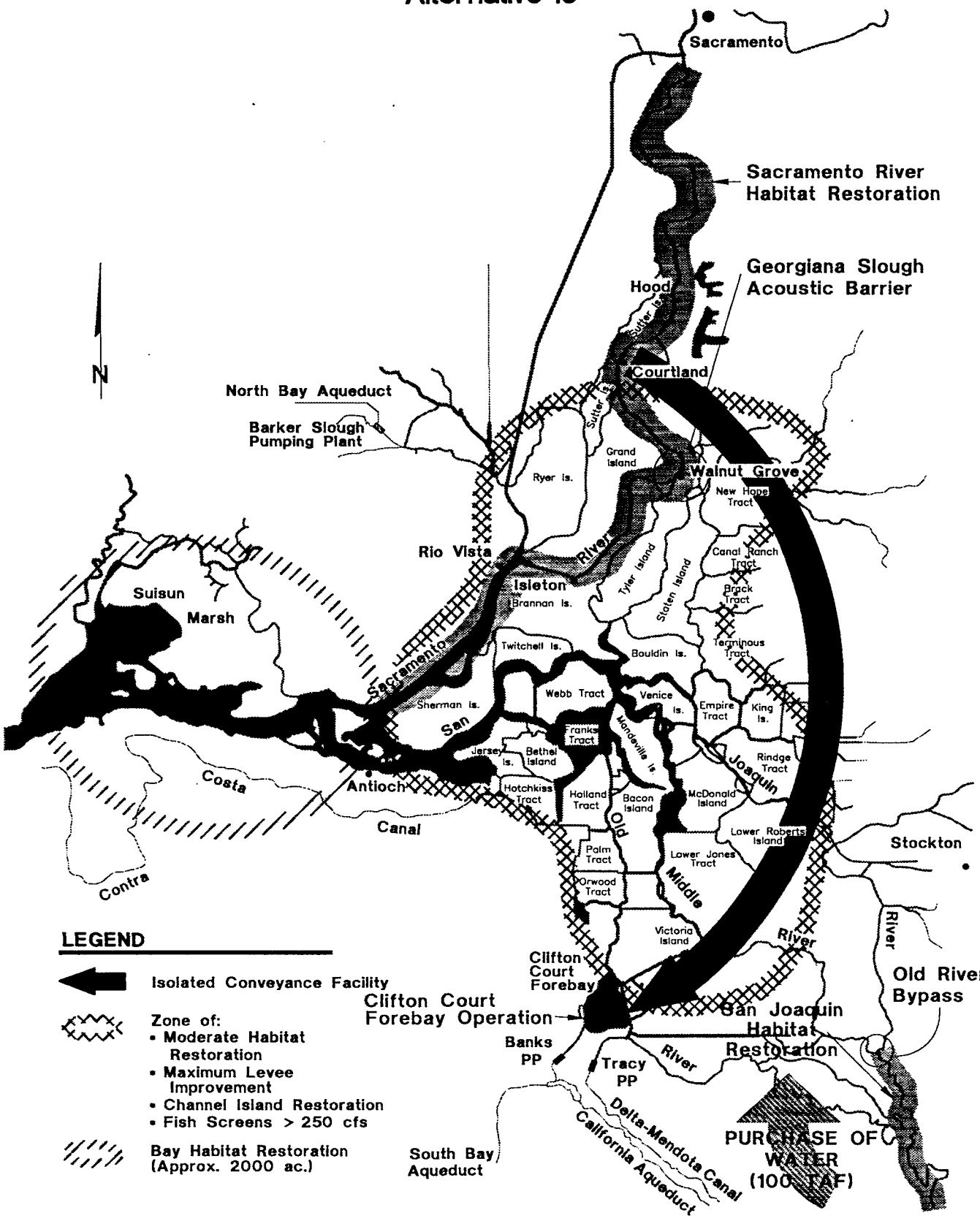
Constraints and Concerns

- Minimal guarantees for supply reliability
- Minimal reductions in system vulnerability
- No fish production actions
- Diversions in critical habitat (Delta smelt on the Sacramento River)
- Continued reliance on south Delta export facility

PRELIMINARY DRAFT

Delta Island Protection and Small Isolated Facility

Alternative 10



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This alternative combines maximum levee improvements with upstream operational modifications, habitat restoration and creation, and storage and conveyance improvements to achieve maximum reductions in system vulnerability, substantial improvements in Delta aquatic and terrestrial habitat, and equitable water supply flexibility. Extensive habitat restoration and natural flood protection actions are integrated with levee improvements. A small, isolated transfer facility is included to connect the relocated diversion to existing pumping facilities. The isolated facility essentially eliminates some of the vulnerability of the Delta to salinity intrusion as a result of catastrophic levee failure.

This alternative decreases entrainment of anadromous and Bay-Delta native fish and fish food, primarily through relocation of diversions. Relocated diversions improve water quality, and reduce constraints associated with entrainment of fish.

Delta water quality is improved by reducing pollutant loading of the Delta via upstream source controls. The vulnerability of Delta land use, Delta water supply, water supply and Delta ecosystem function to catastrophic failure is reduced by improving levees throughout the Delta.

Physical and Structural Features

Relocate Export Diversion Facilities to Sacramento River— Provide exporters access to higher quality water while reducing the entrainment effects of existing facilities by relocating export diversion facilities to the Sacramento River upstream of the Delta (near Hood for example). Provide best available technology fish screens. Real time monitoring of anadromous fish populations and movement is used to avoid entrainment of large concentrations of fish eggs and larvae.

Flood Protection Level— This action provides a maximum level of protection to Delta system levees. First, all levees not yet providing a level of protection equivalent to the hazard mitigation plan (HMP) will receive the necessary upgrades to their levees to meet HMP standards. A level of flood protection equivalent to the maximum credible earthquake (MCE) standard would be provided to critical western Delta islands (such as Sherman and Jersey islands), and islands with important regional infrastructure (e.g. the

Mokelumne Aqueduct, transmission lines, Highway 160, etc.). A level of flood protection equivalent to the US Army Corps of Engineers' Public Law (PL)- 99 standard would be provided to: 1) islands having infrastructure of local importance (such as New Hope Tract, Bouldin Island, Palm Tract, Lower and Upper Jones Tracts, and Lower Roberts Island); and 2) islands having valuable habitat, but not necessarily infrastructure, (including, but not necessarily limited to Canal Ranch, Brack Tract, Staten Island, Venice Island, Rindge Tract, and Big Mandeville Island).

Channel Improvements and Levee Maintenance— A maximum level of channel improvements (e.g. widening for improved conveyance), levee maintenance and stabilization (e.g. stabilizing berms), the modification of agricultural practices to reduce subsidence potential, setback levees, providing funding for maintenance and stabilization, and maintaining and/or reconstructing levees are indicative of the range of actions that would be implemented with the intent of reducing the risk of the Delta levee system with respect to its value in providing water supply, water quality, ecosystem quality, and land use/infrastructure benefits.

Construct Small Isolated Transfer Facility— Construct small east-side isolated transfer facility for balanced inflow and conveyance benefits. Transport water around the Delta from the new diversion location to the existing pumping facilities in a facility sized at approximately 5000 to 7,000 cfs. The construction and improvement of the facility would be done in conjunction with other actions intended to improve the transport of water among eastern Delta channels. New or improved facilities would transfer water more efficiently than the current system, and would provide higher quality water. The small facility would conserve water otherwise lost to seepage, leakage, and evaporation that can occur in tributary channels. Entrainment losses of fishes would also be slightly reduced with more control over eastside flows. That control would reduce the incidence of attraction flows causing fish entrainment and/or stranding in eastside Delta channels.

Increase East Side Channel Flood Flow Capacity— Increase flood flow routing capabilities and flexibility from the Sacramento River to the central Delta by increasing the capacities of existing east-side Delta channels and modifying Delta levees to increase flow cross-sections for more effective movement of water. Efforts would focus on the Mokelumne River capacity, but also would include the Consumnes River, Dry Creek, Morrison Creek stream group, and Deer Creek. Capacity increases and natural flood protection measures would be integrated to reduce the incidence of extensive flooding and levee failures affecting interior Delta islands and leveed tracts without substantially compromising valuable habitat components or contiguity.

Delta Levee Habitat Restoration— Restore approximately 100 levee miles of shallow water, riverine and riparian habitat in the Delta to provide forage and cover habitat for resident and anadromous fish, and to provide other benefits associated with riparian habitat. Actions might include setback levees, creation of berms, creation of shallow water habitat, and increased vegetation on levees in coordination with flood protection efforts. Considerations for site selection will include distance from hazards such as pumping plants, protection from waves generated by wind and boat wakes, importance of island integrity to the maintenance of Delta water quality, and the need to improve channel capacity and structural stability of levees. Good candidate areas are Twitchell Island along Three Mile Slough and Seven Mile Slough, Georgiana Slough, and the north and south forks of the Mokelumne River.

Delta Habitat Restoration— Restore shallow water and tidal wetland habitat in the Delta to provide spawning areas, forage areas, and escape cover for juvenile salmon, Delta smelt, splittail, and other species. Candidate areas include Prospect Island, Liberty Island, Little Holland Tract, Hastings Tract, Yolo Bypass, and the southeast Delta. Also restore shallow water shoreline habitat along margins of the lower Sacramento and San Joaquin channels, and tributary sloughs including Georgianna Slough, Barker Slough, Lindsey Slough, and Parker Island. Riparian, wetland, and terrestrial habitat would also be restored on Delta islands and upland areas adjacent to river channels such as Decker Island.

San Joaquin River Habitat Restoration— Restore channel features to improve fish survival. Actions may include restoration of deeper, narrower channel areas to keep water cooler, and isolation of quarry areas to protect young fish from predation and straying.

Improve Natural Flood Protection— Enhance flood protection and create new habitat by allowing rivers to meander, relocating levees to create floodways, and modifying flood ways to support wetland habitats. Integrate these natural flood protection actions with levee improvements to protect Delta functions as an integrated resource system.

Bay Habitat Restoration— Restore about 2,000 acres of tidal wetlands between Collinsville and Carquinez Strait. Actions may include conversion of diked wetlands to tidal wetlands or use of dredge spoils to create wetland areas. The resulting habitat types will provide wet year spawning habitat for Delta smelt, rearing areas for salmon, as well as habitat for diverse wildlife including canvasback and redhead ducks.

Channel Islands— Restore and protect channel islands. Evaluate the contribution of upstream meander belts to sediment deposition at channel islands. Establish zones for different types of boating use so some areas and adjacent levees are protected from large boat wakes.

Other Programs— Implement recommended habitat restoration actions from other programs, including CVPIA and the Anadromous Fish Restoration Plan. Examples of specific actions include small dam removal on Clear Creek, dam removal on Battle Creek, establishment of a population of winter run chinook salmon on Battle Creek.

Sacramento River Habitat Restoration— Restore riparian, shaded riverine, and shallow water habitat along the Sacramento River from Sacramento to Collinsville. First step will be to provide matching funds for Corps of Engineers feasibility study. Subsequent restoration would be funded 75 percent by COE.

Fish Screens— Install fish screens on diversions over 250 cfs that are on fish migration routes in the Delta, rivers, and tributaries.

Develop Storage in the Delta and In Export areas— Develop island storage in the Delta and in export areas to provide additional flood control management allowing optional transfers of carryover storage to the Delta, and to otherwise facilitate water transfers, capture unregulated flows, minimize storage constraints on exports, and provide critical-period supply, and the proposed Delta Wetlands project within the Delta. Several off stream reservoirs are presently in the planning or construction phase, including the Los Vaqueros Reservoir (a project of the Contra Costa Water District), the Domenigoni Valley Reservoir (a project of the Metropolitan Water District of Southern California).

Expand Off-Stream Storage— Develop additional off-stream storage to augment and increase the reliability of existing supplies, and to allow more flexibility in reservoir operations to accommodate flow and temperature regimes needed by anadromous and resident fisheries. New or expanded off stream storage, the creation of water storage capacity in locations away from the sources of water, may include constructing new reservoirs or increasing the capacity of existing reservoirs.

Operational and Management Features

Improve Pollutant Source Controls— These actions would provide for an array of increased source reduction activities such as additional regulation of agricultural and urban drainage and better enforcement, establishing best management practices (BMP's) for a range of activities affecting Delta water quality such as levee maintenance and pest control practices, and supporting and enhancing existing land retirement and fallowing programs.

Identify and control high priority pollutant sources through a combination of source reduction and treatment actions. Intense application of core level actions such as implementing source control regulations for pollutants, levee maintenance best management practices to encourage use of materials compatible with good water quality, retirement of lands with serious drainage disposal problems, retirement or fallowing agricultural lands with salt or other contaminant drainage problems to reduce land-derived salt contamination, management of irrigation tailwater, retention and management of stormwater runoff, and management of discharges from abandoned mining sites would improve water quality management.

Implement on-site mine drainage remediation measures based on requirements in current regulations. Provide regulatory incentives and develop institutional agreements to enable focusing resources on priority sources. Through changes in water pollution requirements give urban areas flexibility to fund high-priority mine cleanup in lieu of increasing expenditures on treatment plant improvements.

Manage Irrigation Tailwater to Reduce Pesticides— Utilize wetlands, treatment processes, or holding reservoirs to store or retard surface agricultural drainage, reduce pesticide concentrations, and/or make releases during higher instream flow periods.

Retain and Manage Stormwater Runoff— Utilize wetlands, treatment processes, or holding reservoirs to reduce contaminant concentrations and to store or retard contaminated flows and stormwater drainage for release during periods of higher instream flows.

Conservation— Conservation and water pricing are implemented at maximum levels to substantially reduce water demand and improve the reliability of the Delta as a source of export water supply. Residential, industrial, and agricultural demand reduction in and upstream of the Delta are implemented to increase Delta inflows in drier water years as

needed to meet delivery and environmental obligations. Measures capable of achieving an equivalent, equitable maximum level of demand reduction are implemented in the export areas to improve the reliability of the Delta as a source of export water supply.

Obtain Environmental Water— Obtain approximately 100,000 acre feet from San Joaquin water users to reduce conflicts between fisheries and diversions. Water could be used to provide pulse flows to move Delta smelt downstream, away from diversion points. Another use might be dilution of poor quality San Joaquin River flows, providing benefits for fisheries, water supply, and water quality. New south-of-Delta storage would allow this water to be used as exchange water so that Delta diversions could be reduced at critical times to protect fisheries without affecting export supplies.

Institutional and Policy Features

Encourage Groundwater Banking and Conjunctive Use— Encourage groundwater banking and conjunctive use in the export all areas dependent on Delta waters. Provide incentives for users to shift reliance from surface water to ground water to reduce competition for surface water supplies. Incentives for conjunctive use are implemented at very high levels to enhance available water supplies. Increase support of efforts to provide increased opportunities for groundwater banking and conjunctive use during dry and below normal years to reduce the need for surface waters.

Reclamation, and Alternative Supply Development— Reclamation and other cost-effective management of urban and industrial discharges and runoff are implemented at maximum levels to improve Delta water quality. Incentives for maximum reasonable improvement of stormwater management practices, including increased construction and use of detention basins and more comprehensive and effective drainage systems would be provided to minimize event-driven volumes of pollutants entering surface waters or groundwater basins. The development of alternative sources of water supply for export areas will greatly improve the reliability of the Delta as a source of export water supply.

Improve Coordination of Land Use Planning and Water Supply Planning— Provide incentives for local and regional coordination of land use and water supply planning and support long-term institutional efforts to encourage coordination. Institutional measures that increase (and accelerate) the ability of water managers and operators of state and federal facilities to jointly and cooperatively respond to urgent and/or highly beneficial water management requirements would be afforded high priority.

Water Marketing and Transfers— Modify the California Water Code to ease the implementation and permitting procedures for water transfers, and establish a brokerage for transfers. Increase the efficient utilization of existing water supplies by facilitating water marketing and market-driven pricing. Water transfers are implemented at maximum reasonable levels to substantially increase water supply predictability. Facilitate additional water marketing during dry and average year supplies to increase the efficient utilization of existing water supplies during periods of peak demand on other sources. Streamlined implementation/permitting of water transfers and the maturation of a market-driven pricing system will increase supply reliability and could subsequently stimulate economic activity by strengthening the financial position of development projects that otherwise may be economically marginal given future uncertainties regarding water availability.

Long-Term Planning for Drought Contingencies— Improve drought response planning by developing long-term drought contingency plans. Respond to future drought conditions by increasing water storage capacities at user locations to provide temporary supplies during shortages or facility outages. This increases the reliability of supplies in such situations.

Land Retirement and Fallowing— Maximize retirement of marginal agricultural lands and lands of willing sellers. Maximize land fallowing during drought periods. Implement retirement of marginal agricultural lands and lands from willing sellers. Fallow enough land during drought periods to reduce current deficiencies while maintaining ecosystem quality at acceptable levels. Land retirement and fallowing of lands adjacent to levees can control subsidence and is potentially available to replace habitat lost due to levee maintenance and stabilization actions. Land retirement and fallowing in the Delta can also reduce organic content of Delta water used for export purposes.

Delta Inflow Management— Create a Delta water master's office to manage Delta inflows, central channel operations, and outflows and export operations. The water master's office would provide a rapid response capability to be used in coordination with core actions calling for improved real-time monitoring and adaptive management.

Subsidence Reduction— Efforts to reduce the subsidence on Delta islands with deep peat soils (such as parts of Grand, Twitchell, Sherman, Andrus, and Bouldin islands) will include the establishment of a landside buffer zone between 100 and 200 yards in width, located adjacent to the levee.

Emergency Levee Management Plan— An emergency levee management plan would provide necessary funding and direction to reclaim Delta islands in the event of inundation to continue protection of Delta functions as an integrated resource system. Funding would be provided to ensure that a suitable amount of equipment and materials would be readily available to rapidly respond to flood fights.

Preliminary Assessment

Benefits

Ecosystem Quality— This alternative would substantially improve ecosystem quality through the reduction of diversion effects that occurs with the relocation and screening of export diversions. Support of the CVPIA and AFRP actions will increase fish populations. Diversion relocations improve aquatic habitat. Land retirement and fallowing in the Delta, accompanied by active management of such retired lands for wildlife (e.g. seasonal wetlands) could provide areas for habitat restoration. Flood protection improvements are integrated with Delta shallow water habitat restoration and the creation of a variety of aquatic, riparian, wetland, and terrestrial habitats, supported by upstream and in-Delta natural flood protection measures that allow river meanders and setback levees where such improvements will not compromise desired reductions in system vulnerability.

Water Supply— The small isolated transfer facility improves conveyance capabilities and export water quality. Relocated export diversions reduce the constraints currently associated with entrainment of fish at the export diversion, thereby improving export water supply and reliability. Export diversion relocation also results in decreased "carriage water" requirements, making more water available for water supply and environmental uses, which would share in any real savings.

Conservation, both in the Delta and in other areas dependent on Delta waters, and land retirement and fallowing are used to reduce demand. Combining conservation, land retirement and fallowing, and wastewater reclamation reduces direct demand by reducing surface water diversions, or in some cases, groundwater pumping.

The expansion of off-stream storage and development of storage in the Delta and in export areas increases operational flexibility and improves the reliability of existing Delta inflows for meeting both in-Delta habitat needs and export supply needs. The

construction of a small east-side isolated transfer facility designed to improve higher quality water supply reliability complements east-side channel improvements made for flood routing purposes, and improves interrelated operational flexibility with respect to both water supply and flood flow routing capabilities.

Demand reduction actions, including conservation, incentives encouraging groundwater banking and conjunctive use, and reclamation complement other key flood protection, key levee maintenance improvements, stabilization, and seismic protection actions, habitat, and storage/supply enhancement actions by ensuring that long-term flexibility gains are not lost to concurrent increases in future demand.

Water Quality— This alternative improves export water quality by relocating diversions upstream of the Delta. Delta water quality is also improved through reduction of pollutant discharges and loading from the San Joaquin River (along with reclamation of agricultural, municipal, and industrial wastewater). Land retirement and fallowing in the Sacramento and/or San Joaquin Valleys, or in other marginally productive areas dependent on Delta waters could lead to overall improvements in Delta water quality by reducing the areal extent of agricultural lands (and applied agricultural chemicals) contributing nonpoint and point discharge. Improvements in Delta water quality are also achieved through agricultural, industrial, and municipal wastewater reclamation and reuse (recycled water).

System Reliability— Relocating export facilities outside of the Delta essentially eliminates the risk that operations will be interrupted by a failure of in-Delta facilities. In-Delta habitat restoration simultaneously provides better levees and protection for adjacent land uses. Improvement of the levees around Delta islands protects those islands as well as protecting Delta water supplies from salinity intrusion due to island failure.

Constraints and Concerns

Ecosystem Quality— This alternative has no actions to increase fish populations, either naturally or through increased hatchery management. There are no integrated habitat management actions, and only minimal upland restoration efforts. The isolated facility diverts water within the critical habitat area designated for Delta smelt, which could reduce diversion and pumping opportunities.

Water Supply— This alternative achieves only minimal gains in water supply reliability.