

**Preliminary Alternative #32**

Corresponding to Alternative Formulation Strategy 1B,2B,3B,4B - MAX

Primary Conflict	Approach to Resolve Conflict
Fisheries and Diversions (Conflict 1)	Increase Fish Productivity (1A) <b>Reduce Diversion Impacts (1B)</b>
Habitat and Land Use/Flood Protection (Conflict 2)	Preserve Existing Land Use (2A) <b>Create Additional Habitat Area (2B)</b>
Water Supply Availability and Beneficial Uses (Conflict 3)	Reduce Critical Export Area Demands (3A) <b>Enhance Delta Supplies as Inflows (3B)</b>
Water Quality and Land Use (Conflict 4)	Managing Quality of Delta Inflow (4A) <b>Manage Instream/In-delta Water Quality (4B)</b>
Minimum or Maximum	

**Solution Overview**

This maximum alternative focuses on reducing losses to fish populations (i.e. reducing diversion losses) rather than increasing fish production. It also increases wetland, riparian, and terrestrial habitat at the expense of existing land use. It also increases inflow to the Delta especially in critical periods, while maintaining existing Delta exports and south of Delta consumption. Water quality is maintained mainly through dilution rather than by source controls.

**Actions Selected**

Habitat - This alternative is characterized by minimal actions to improve Delta fish habitat. High levels of riparian, wetland, and terrestrial habitat improvements would benefit many fish and wildlife species. Upstream floodway and channel enhancements would provide improved habitat for fish & wildlife.

Populations - Key fish populations are enhanced through reducing existing impacts from water diversions and increasing Delta inflow during critical periods. Maximum efforts would be made to improve diversion locations and screening and salvage measures at existing diversions. Improved water conveyance facilities including through Delta or isolated options would be employed to minimize fish entrainment.

Diversions - Diversions are limited upstream of the Delta to increase water supply to the Delta; Delta exports would be limited to reduce diversions during critical periods to reduce entrainment. Maximum efforts are proposed to reduce diversions and decrease north of Delta consumptive use.

Water Use - Exports from the Delta and south of Delta consumption are minimally affected; diversions north of the Delta are reduced to increase inflow to Delta.

Water Quality - Controlled mainly through dilution rather than source controls.

Land Use/Levees/Flood Protection - Existing landuse is modified as needed to improve habitat; levee and flood control protection are maximized.

Institutional - Measures require maximum use of institutional capabilities.

**Preliminary Assessment**

This alternative's implementation would achieve major reduction in entrainment losses at existing water diversions through a combination of enhanced screening, isolation and relocation of diversions, and changes in land use and irrigation patterns. Direct physical habitat enhancements for key Delta fish species would be limited; however, habitat enhancement from improved wetlands and riparian habitats, as well as changes in through-Delta conveyance facilities would provide substantial habitat improvements for fish. Substantial benefits would be achieved in upstream fish and wildlife habitat. Existing Delta and south of Delta exports would be protected to a large extent, while some effects on north of Delta exports would occur, but could be replaced by shifts in water supply sources (ground water). Water quality in the Delta may suffer from the combination of an isolated water transfer facility and lack of source water quality controls. More Delta inflow and outflow would be required to maintain water quality. Many of the options for habitat improvement, reduced diversion impacts (intake screening) and levee, wetland, and riparian protection would be costly.

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Alternative 32 (1B, 2B, 3B, 4B - MAX)			
Category	Actions Selected	Functional Basis for Inclusion	Specification for Action Implementation
Restoration of Delta Wetland Habitat	-Expand wetland acquisition programs	Improved habitat for all species	
	-Convert agricultural lands to wetlands	Improved habitat for all species	
Restoration of Delta Terrestrial Habitat	Restoration of Delta Terrestrial Habitat	Improved habitat for terrestrial species	
Integrated Habitat Management Programs	-Establish regional ecosystem restoration guidelines	Improved habitat for all species	
	-Implement integrated regional habitat management	Improved habitat for all species	
	-Develop cooperative management agreements	Improved habitat for all species	
	-Establish mitigation banking program	Improved habitat for all species	
Establishment of Floodways and Meander Belts	-Relocate levees to widen floodways	Improved habitat for all species	
	-Allow river channels to meander	Improved habitat for all species	
	-Acquire Delta islands as overflow areas	Improved habitat for all species	
	-Restore floodways as habitat corridors	Improved habitat for all species	
Control of Introduced Species	-Inspect for invasions of nuisance species	Improved habitat for native species	
Delta Waterfowl Habitat Management	-Manage crops for waterfowl forage production	Improved habitat for terrestrial species	
	-Improve management of public waterfowl areas	Improved habitat for terrestrial species	
	-Implement terrestrial predator control program	Improved habitat for terrestrial species	
	-Increase sources and availability of wildlife forage	Improved habitat for terrestrial species	
Restoration of Upstream Anadromous Fish Habitat	-Restore and replenish spawning gravels	Improvements for anadromous fish species	
	-Restore channel configurations	Improvements for anadromous fish species	
	-Restore shoreline habitat conditions	Improvements for anadromous fish species	
	-Improve floodway drainage to reduce fish stranding	Improvements for anadromous fish species	
Restoration of Upstream Riparian Habitat	-Restrict livestock grazing in riparian corridors	Improved habitat for all species	
	-Revegetate degraded riparian habitats	Improved habitat for all species	
	-Protect riparian lands through purchase/easements	Improved habitat for all species	
Restoration of Upstream Wetland Habitat	-Modify floodways to support wetland habitats	Improved habitat for all species	
	-Reuse agricultural drainage to create wetlands	Improved habitat for all species	
	-Reuse urban wastewater effluent to create wetlands	Improved habitat for all species	
	-Manage groundwater recharge for wetland habitat	Improved habitat for all species	
Delta Inflow Management	-Decrease upstream diversions	Reduce diversion impacts and increase inflow	
	-Modify upstream reservoir operations	Reduce diversion impacts and increase inflow	
	-Modify Delta inflow timing pattern	Reduce diversion impacts and increase inflow	
	-Provide instream pulse flows for fish passage	Reduce diversion impacts and increase inflow	
	-Provide instream flows for fish attraction	Reduce diversion impacts and increase inflow	
Delta Outflow/Export Management	-Modify volumes and timing of exports	Reduce diversion impacts and improve habitat	
	-Modify export operations criteria	Reduce diversion impacts and improve habitat	
	-Establish a Delta watermaster to manage flows	Reduce diversion impacts and improve habitat	
Modification of Diversion Timing Patterns	-Modify diversion timing of in-Delta diversions	Reduce diversion impacts and improve habitat	
	-Modify diversion timing of export diversions	Reduce diversion impacts and improve habitat	
	-Coordinate SWP/CVP diversion timing	Reduce diversion impacts and improve habitat	
	-Modify diversion timing through Montezuma SCG	Reduce diversion impacts and improve habitat	

	Use real-time monitoring and adaptive management	Reduce diversion impacts and improve habitat	
Increased Rates of Diversion Capacity	Obtain approvals for expanded export capacities -To reduce diversion impacts -Enlarge export pumping capacities -To reduce diversion impacts	Reduce diversion impacts and improve habitat Reduce diversion impacts and improve habitat Reduce diversion impacts and improve habitat	
Acquire Water Supplies for Fish and Wildlife	Acquire water for refuge habitat use Obtain rights in diversion bring patterns Modify water law to establish instream rights	Improved habitat for terrestrial species Reduce diversion impacts and improve habitat Reduce diversion impacts and improve habitat	
Installation and Improvement of Fish Screens	Improve screens at Delta export pumps Improve other existing fish screen systems Install screens on other In-Delta diversions Install screens on upstream diversions Consolidate and screen existing spill diversions Enforce screening requirements	Reduce diversion impacts Reduce diversion impacts Reduce diversion impacts Reduce diversion impacts Reduce diversion impacts Reduce diversion impacts	
Installation of Barriers to Guide Fish Movement	Install barriers to block fish movement into Old River Install barriers to divert fish from Sacramento to western channels	Reduce diversion impacts Reduce diversion impacts	
Improvement of Fish Salvage Operations	Improve design of salvage facilities Improve operation of salvage facilities Improve fish handling and release procedures	Reduce diversion impacts Reduce diversion impacts Reduce diversion impacts	
Removal and Control of Aquatic Predators	Harvest predators at Delta export pumps Harvest predators in upstream habitats	Reduce diversion impacts Increase salmon populations	
Desalination	Expand desalination of San Joaquin Valley supplies	Increase Delta inflow & improved water quality	
Water Conservation (North of Delta Only)	Increase use of district-wide conservation practices Increase use of on-farm conservation practices Increase use of municipal conservation practices Increase use of industrial conservation practices Implement financial incentive policies Implement financial incentive policies Educate users about conservation technologies Implement conservation-oriented rate structures	Increase Delta inflow in critical periods Increase Delta inflow in critical periods	Action to be implemented upstream of Delta Action to be implemented upstream of Delta
Water Reclamation (North of Delta Only)	Recharge groundwater with reclaimed water Use reclaimed water for agricultural irrigation Reclaim saline agricultural drainage water Recycle and treat water for possible reuse Use reclaimed water for nonpotable urban uses Use reclaimed water for landscape irrigation Use reclaimed water for power plant cooling Use reclaimed water for industrial processes Use reclaimed water to treat safety intrusion Improve reclamation technologies and cost Educate public about water reclamation	Increase Delta inflow in critical periods Increase Delta inflow in critical periods	Action to be implemented upstream of Delta Action to be implemented upstream of Delta
Land Retirement and Following	Encourage land following during drought periods Develop incentive programs for land retirement Purchase lands or easements	Increase Delta inflow in critical periods Increase Delta inflow in critical periods Increase Delta inflow in critical periods	
Watershed Management	Manage vegetation cover to increase yield Manage land uses to protect water quality	Increase Delta inflow in critical periods Improved water quality and fish habitat	

