

Preliminary Alternative #31

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

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

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.

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 source controls rather than dilution.

Land Use/Levees/Flood Protection - Existing land use 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 minor reduction in entrainment losses at existing water diversions through a combination of enhanced screening, 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 would provide minor 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 would improve through 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.

27-NOV-95	Alternative 31 (1B, 2B, 3B, 4A - 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	
		Restoration of Delta Terrestrial Habitat	Restoration of Delta Terrestrial Habitat	Improved habitat for terrestrial species	
		Integrated Habitat Management Programs	-Establish regional ecosystem restoration guidelines -Implement integrated regional habitat management -Develop cooperative management agreements	Improved habitat for all species Improved habitat for all species Improved habitat for all species	
		Establishment of Floodways and Meander Belts	-Relocate levees to widen floodways -Allow river channels to meander -Acquire Delta islands overflow areas -Restore floodways as habitat corridors	Improved habitat for all species Improved habitat for all species Improved habitat for all species Improved habitat for all species	
		Control of Introduced Species	-Inspect for invasive organisms species -Manage crops for wetland forage production -Implement terrestrial predator control programs -Increase sources and availability of fish forage	Improved habitat for terrestrial species Improved habitat for terrestrial species Improved habitat for terrestrial species Improved habitat for terrestrial species	
		Restoration of Upstream Anadromous Fish Habitat	-Restore and replenish spawning gravels -Restore channel configurations -Restore stream habitat conditions -Improve floodway drainage to reduce fish stranding	Improvements for anadromous fish species Improvements for anadromous fish species Improvements for anadromous fish species Improvements for anadromous fish species	
		Restoration of Upstream Riparian Habitat	-Restrict livestock grazing in riparian corridors -Revegetate degraded riparian habitats -Protect riparian lands through purchase/assessments	Improved habitat for all species Improved habitat for all species Improved habitat for all species	
		Restoration of Upstream Wetland Habitat	-Modify floodways to support wetland habitats -Reuse agricultural drainage to create wetlands -Reuse urban wastewater effluent to create wetlands -Manage groundwater recharge for wetland habitat	Improved habitat for all species Improved habitat for all species Improved habitat for all species Improved habitat for all species	
		Delta Inflow Management	-Decrease upstream diversions -Modify upstream reservoir operations -Modify Delta inflow timing pattern -Provide instream pulse flows for fish passage -Provide instream flows for fish attraction	Reduce diversion impacts and increase inflow Reduce diversion impacts and increase inflow Reduce diversion impacts and increase inflow Reduce diversion impacts and increase inflow	
		Delta Outflow/Export Management	-Modify volumes and timing of exports -Modify export operations criteria -Establish a Delta wastewater to manage flows	Reduce diversion impacts and improve habitat Reduce diversion impacts and improve habitat Reduce diversion impacts and improve habitat	
		Modification of Diversion Timing Patterns	-Modify diversion timing of in-Delta diversions -Modify diversion timing of export diversions -Coordinate SVP/CVP diversion timing -Modify diversion timing through Montezuma SCG -Use real-time monitoring and adaptive management	Reduce diversion impacts and improve habitat Reduce diversion impacts and improve habitat	

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Increased Rates of Diversion Capacity	<ul style="list-style-type: none"> - Obtain approvals for expanded export capacities - To reduce diversion impacts - Enhance export pumping capacities - To reduce diversion impacts 	Reduce diversion impacts and improve habitat	
Acquire Water Supplies for Fish and Wildlife	<ul style="list-style-type: none"> - Acquire water for refugia habitat use - Obtain rights in diversion bring patterns - Modify water law to establish instream rights 	<ul style="list-style-type: none"> - Improved habitat for beneficial species - Reduce diversion impacts and improve habitat - Reduce diversion impacts and improve habitat 	
Installation and Improvement of Fish Screens	<ul style="list-style-type: none"> - Improve screens at Delta export pumps - Improve other existing fish screen systems - Install screens on other in-Delta diversions - Considerable and screen existing small diversions - Enforce screening requirements 	<ul style="list-style-type: none"> - Reduce diversion impacts 	
Installation of Barriers to Guide Fish Movement	<ul style="list-style-type: none"> - Install barriers to block fish through the Redwood River - Install barriers to divert fish from Sacramento to western channels 	<ul style="list-style-type: none"> - Reduce diversion impacts - Reduce diversion impacts 	
Improvement of Fish Salvage Operations	<ul style="list-style-type: none"> - Improve design of salvage facilities - Improve operation of salvage facilities - Improve fish handling and release procedures 	<ul style="list-style-type: none"> - Reduce diversion impacts - Reduce diversion impacts - Reduce diversion impacts 	
Removal and Control of Aquatic Predators	<ul style="list-style-type: none"> - Harvest predators at Delta export pumps - Harvest predators in upstream habitats 	<ul style="list-style-type: none"> - Reduce diversion impacts - Increase salmon populations 	
Desalination	<ul style="list-style-type: none"> - Expand desalination of San Joaquin Valley supplies 	<ul style="list-style-type: none"> - Increased Delta inflow & improved water quality 	
Water Conservation (North of Delta Only)	<ul style="list-style-type: none"> - 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 - Educate users about conservation technologies - Implement conservation-oriented rate structures 	<ul style="list-style-type: none"> - Increase Delta inflow in critical periods 	<ul style="list-style-type: none"> - Action to be implemented upstream of Delta
Water Reclamation (North of Delta Only)	<ul style="list-style-type: none"> - 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 cool safety intrusion - Improve reclamation technologies and cost - Educate public about water reclamation 	<ul style="list-style-type: none"> - Increase Delta inflow in critical periods 	<ul style="list-style-type: none"> - Action to be implemented upstream of Delta
Land Retirement and Following	<ul style="list-style-type: none"> - Encourage land following during drought periods - Develop incentive programs for land retirement - Purchase lands or easements 	<ul style="list-style-type: none"> - Increase Delta inflow in critical periods - Increase Delta inflow in critical periods - Increase Delta inflow in critical periods 	
Watershed Management	<ul style="list-style-type: none"> - Manage vegetation cover to increase yield - Manage riparian zones to protect water quality - Manage land uses to protect water quality - Modify weather to increase precipitation 	<ul style="list-style-type: none"> - Increase Delta inflow in critical periods - Improved water quality and fish habitat - Improved water quality and fish habitat - Increase Delta inflow in critical periods 	

