

List of Action Categories and Actions

Comments on Action Categories and Actions

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	Importance 1 - 5	Core Action C
Action Categories to Restore Bay-Delta System Habitats		
Restoration of Bay-Delta System Shallow Water (Tidal) Habitat	<u>3</u>	<u> </u>
Actions:		
-Convert existing leveed lands to tidal action	<u> </u>	<u> </u>
-Protect existing shallow habitat from erosion	<u> </u>	<u> </u>
-Restore tidal action to existing diked wetlands	<u> </u>	<u> </u>
-Reconstruct levees to include shallow water habitat	<u> </u>	<u> </u>
-Fill deep water to produce shallow habitat	<u> </u>	<u> </u>
Restoration of Bay-Delta System Riverine Habitat	<u>4</u>	<u> </u>
Actions:		
-Reconstruct river banks and shallow areas	<u> </u>	<u> </u>
-Restore and preserve channel islands	<u> </u>	<u> </u>
-Restore natural channel configurations	<u> </u>	<u> </u>
-Modify channel/levee construction practices to include riverine elements	<u> </u>	<u> </u>
Restoration of Bay-Delta System Riparian Habitat	<u>2</u>	<u> </u>
Actions:		
-Improve and protect degraded riparian habitats	<u> </u>	<u> </u>
-Establish new areas of riparian habitat	<u> </u>	<u> </u>
-Reestablish historic riparian areas	<u> </u>	<u> </u>
-Modify levee maintenance practices	<u> </u>	<u> </u>
-Protect existing riparian habitat	<u> </u>	<u> </u>

	Importance 1 - 5	Core Action C
Restoration of Bay-Delta System Wetland Habitat	<u>3</u>	_____
Actions:		
-Restore, enhance, and create wetlands	_____	_____
-Expand wetland acquisition programs	_____	_____
-Convert agricultural lands to wetlands	_____	_____
-Protect existing wetland habitat	_____	_____
Restoration of Bay-Delta System Terrestrial Habitat	<u>2</u>	_____
Actions:		
-Protect existing upland habitat	_____	_____
-Establish upland habitat on levees	_____	_____
Establish upland habitat on fallowed croplands	_____	_____
-Establish oak woodlands on suitable soils	_____	_____
-Encourage wildlife-friendly agricultural practices	_____	_____
-Preserve agricultural land uses providing habitat	_____	_____
-Clean up sites contaminated with toxic substances	_____	_____
Implementation of Integrated Habitat Management Programs	<u>5</u>	<u>C</u>
Actions:		
-Establish regional ecosystem restoration guidelines	_____	_____
-Implement integrated regional habitat management	_____	_____
-Develop cooperative management agreements	_____	_____
-Establish mitigation banking program	_____	_____
Establishment of Floodways and Meander Belts	<u>2</u>	_____
Actions:		
-Relocate levees to widen floodways	_____	_____
-Allow river channels to meander	_____	_____
-Acquire Delta islands as overflow areas	_____	_____
-Restore floodways as habitat corridors	_____	_____
Control of Introduced Species	<u>3</u>	<u>C</u>
Actions:		
-Remove or reduce nuisance species in key habitats	_____	_____
-Improve regulation of ballast-water releases	_____	_____
-Improve border inspection practices	_____	_____
-Inspect for invasions of nuisance species	_____	_____
-Modify habitat to favor native species	_____	_____

	Importance 1 - 5	Core Action C
Delta Waterfowl Habitat Management	<u>2</u>	<u> </u>
Actions:		
-Manage agricultural crops for waterfowl forage production	<u> </u>	<u> </u>
-Improve management of public waterfowl areas	<u> </u>	<u> </u>
-Implement terrestrial predator control programs	<u> </u>	<u> </u>
-Increase sources and availability of wildlife forage	<u> </u>	<u> </u>
Action Categories to Restore Upstream Habitat		
Restoration of Upstream Anadromous Fish Habitat	<u>4</u>	<u> </u>
Actions:		
-Manage flows and temperatures in upstream habitats	<u> </u>	<u> </u>
-Restore and replenish spawning gravels	<u> </u>	<u> </u>
-Restore channel configurations	<u> </u>	<u> </u>
-Restore shoreline habitat conditions	<u> </u>	<u> </u>
-Modify gravel mining practices	<u> </u>	<u> </u>
-Improve floodway drainage to reduce fish stranding	<u> </u>	<u> </u>
Improvements for Upstream Fish Passage	<u>4</u>	<u>C</u>
Actions:		
-Modify passage at upstream dams and other barriers	<u> </u>	<u> </u>
-Modify natural barriers to improve passage	<u> </u>	<u> </u>
Restoration of Upstream Riparian Habitat	<u>2</u>	<u> </u>
Actions:		
-Restrict livestock grazing in riparian corridors	<u> </u>	<u> </u>
-Revegetate degraded riparian habitats	<u> </u>	<u> </u>
-Protect riparian lands through purchase/easements	<u> </u>	<u> </u>
-Restore flows to dewatered riparian habitats	<u> </u>	<u> </u>
Restoration of Upstream Wetland Habitat	<u>2</u>	<u> </u>
Actions:		
-Modify floodways to support wetland habitats	<u> </u>	<u> </u>
-Reuse agricultural drainage to create wetlands	<u> </u>	<u> </u>
-Reuse urban wastewater effluent to create wetlands	<u> </u>	<u> </u>
-Manage groundwater recharge for wetland habitat	<u> </u>	<u> </u>

Core
Importance Action
1 - 5 C

Action Categories to Reduce Effects of Diversions

Delta Inflow/Outflow/Export Management	Need <u>linkage</u> w/ <u>data</u> <u>management</u>	
Actions regarding Delta Inflows:		
-Modify upstream consumptive use	<u>4</u>	<u>Need linkage w/other programs:</u>
-Modify upstream reservoir operations criteria	_____	_____
-Modify Delta inflow timing pattern	_____	_____
-Provide instream pulse flows for fish passage	_____	_____
-Provide instream flows for fish attraction	_____	_____
Actions regarding Delta Diversions and Outflows:		
-Modify volumes and timing of exports	<u>4</u>	<u>Need linkage w/storage</u>
-Modify in-Delta consumptive use	_____	_____
-Modify central Delta channel operations	_____	_____
-Modify export operations criteria	_____	_____
-Establish a Delta watermaster to manage flows	<u>5</u>	_____
-Use real-time monitoring and adaptive management	_____	_____
Modification of Diversion Timing Patterns		
-Modify diversion timing of in-Delta diversions	<u>4</u>	<u>Need linkage w/storage</u>
-Modify diversion timing of export diversions	_____	_____
-Coordinate SWP/CVP diversion timing	_____	_____
-Modify diversion timing through Montezuma Salinity Control Gate	_____	_____
-Use real-time monitoring and adaptive management	_____	_____
Increased Rates of Diversion Capacity		
-Obtain approvals for expanded export capacities	<u>5</u>	<u>Need linkage w/storage</u>
-Enlarge export pumping capacities	_____	_____
-Increase diversion capability at Red Bluff Diversion Dam	_____	_____
Acquisition of Long-Term Water Supplies for Fish and Wildlife		
-Acquire water to augment instream flows	<u>4</u>	_____
-Obtain shifts in timing of instream flows	_____	_____
-Obtain shifts in diversion timing patterns	_____	_____

	Importance 1 - 5	Core Action C
-Acquire water for refuge habitat use	_____	_____
-Modify water law to establish instream rights	_____	_____
Installation and Improvement of Fish Screens	<u>4</u>	_____
Actions:		
-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 small diversions	_____	_____
-Enforce screening requirements	_____	_____
Improvement of Bay-Delta System Fish Migration	<u>4</u>	_____
Actions:		
-Install barriers to block fish movement into Old River	_____	_____
-Install barriers to keep fish in Sacramento River	_____	_____
-Install barriers to divert fish from Sacramento River to western distributaries	_____	_____
-Operate fish barrier on San Joaquin River at Merced River confluence in fall	_____	_____
-Provide instream pulse flows for fish passage	_____	_____
-Provide instream flows for fish attraction	_____	_____
Improvement of Fish Salvage Operations	<u>3</u>	_____
Actions:		
-Improve design of salvage facilities	_____	_____
-Improve operation of salvage facilities	_____	_____
-Improve fish hauling and release procedures	_____	_____
Removal and Control of Aquatic Predators	<u>3</u>	C
Actions:		
-Harvest predators at Delta export pumps	_____	_____
-Harvest predators in upstream habitats	_____	_____
Action Categories to Manage the Enhancement of Anadromous Fish Populations		
Fish Hatchery Operations	<u>3</u>	_____
Actions:		
-Expand hatchery capacities	_____	_____
-Construct new hatcheries on the San Joaquin River	_____	_____
-Improve hatchery operations	_____	_____

	Importance 1 - 5	Core Action C
-Reduce hatchery effects on wild fish populations	_____	_____
-Implement tagging of hatchery-bred fish	_____	_____
-Establish new captive breeding programs	_____	_____
Fish Harvest Management	_____	_____
Actions:		
-Improve regulation of commercial take	4	_____
-Improve regulation of recreational take	_____	_____
-Improve enforcement of harvest regulations	_____	_____

Action Categories for Reducing Reliance on Delta Exports Reasonable, implementable levels

Desalination	2	_____
Actions:		
-Expand desalination of Southern California supplies	_____	_____
-Expand desalination of San Joaquin Valley supplies	_____	_____
-Improve desalination technologies and cost	_____	_____
-Educate users about desalination feasibility	_____	_____
Water Conservation	5	C
Actions:		
-Increase use of district-wide conservation practices	4	C
-Increase use of on-farm conservation practices	5	C
-Increase use of municipal conservation practices	4	C
-Increase use of industrial conservation practices	4	C
-Implement financial incentive policies	5	C
-Implement conservation-oriented rate structures	4	C
-Educate users about conservation technologies	5	C
Water Reclamation	4	_____
Actions:		
-Recharge groundwater with reclaimed water	3	_____
-Use reclaimed water for agricultural irrigation	3	_____
-Reclaim saline agricultural drainage water	3	_____
-Recycle and treat water for potable reuse	3	_____
-Use reclaimed water for nonpotable urban uses	5	C
-Use reclaimed water for landscape irrigation	5	C
-Use reclaimed water for power plant cooling	5	C
-Use reclaimed water for industrial processes	5	C
-Use reclaimed water to repel salinity intrusion	3	_____
-Improve reclamation technologies and cost	4	C
-Educate public about water reclamation	4	C

	Importance 1 - 5	Core Action C
Land Retirement and Fallowing	<u>2</u>	_____
Actions:		
-Encourage land fallowing during drought periods	<u>2</u>	_____
-Develop incentive programs for land retirement	<u>3</u>	_____
-Purchase lands or easements	<u>2</u>	_____
-Retire lands with drainage problems	<u>3</u>	_____
Water Pricing	<u>2</u>	_____
Actions:		
-Establish incentives for pricing to reduce demand	<u>2</u>	_____
-Educate users about pricing feasibility	<u>2</u>	_____
-Remove legal obstacles to pricing incentive programs	<u>2</u>	_____
Action Categories to Enhance Water Supplies		
Watershed Management	<u>3</u>	_____
Actions:		
-Manage vegetation cover to increase yield	<u>3</u>	<u>C</u>
-Manage riparian zones to protect water quality	<u>4</u>	<u>C</u>
-Manage land uses to reduce sedimentation	<u>4</u>	<u>C</u>
-Modify weather to increase precipitation	<u>1</u>	_____
New or Expanded Onstream Storage	<u>2</u>	_____
Actions:		
-Construct new storage facilities south of the Delta	_____	_____
-Construct new storage facilities north of the Delta	_____	_____
-Enlarge existing onstream storage reservoirs	_____	_____
-Modify operations of existing onstream reservoirs	_____	_____
New or Expanded Offstream Storage	<u>5</u>	_____
Actions:		
-Construct new storage facilities south of the Delta	<u>5</u>	_____
-Construct new storage facilities north of the Delta	<u>2</u>	_____
-Construct new storage facilities in Delta	<u>2</u>	_____
-Enlarge existing offstream storage reservoirs	<u>5</u>	_____
-Modify operations of existing offstream reservoirs	<u>5</u>	_____
Groundwater Banking and Conjunctive Use	<u>5</u>	_____
Actions:		
-Establish incentives for conjunctive use	<u>5</u>	<u>C</u>
-Modify Water Code to encourage conjunctive use	<u>5</u>	<u>C</u>
-Establish conjunctive use programs	<u>5</u>	<u>C</u>

	Importance 1 - 5	Core Action C
-Store groundwater south of the Delta	<u>4</u>	_____
-Store groundwater north of the Delta	<u>2</u>	_____
-Implement techniques to increase groundwater recharge	<u>4</u>	_____
Improvement of Through-Delta Conveyance	<u>3</u>	_____
Actions:		
-Increase capacities of existing east-side channels	_____	_____
-Increase flows from the Sacramento River to the central Delta	_____	_____
-Modify Delta levees to increase flow cross sections	_____	_____
-Construct pump/siphon systems between Delta channels	_____	_____
-Expand existing intakes at the Delta export facilities	_____	_____
-Construct expanded export intake/forebay pumping system	_____	_____
Construction and Improvement of Conveyance Facilities	<u>5</u>	_____
Actions:		
-Construct east-side isolated transfer system	_____	_____
-Construct west-side isolated transfer system	_____	_____
-Construct small isolated transfer facility	_____	_____
-Convert Delta islands to storage/conveyance system	_____	_____
-Construct conveyance to offstream storage	_____	_____
-Construct conveyance to groundwater storage	_____	_____
Changes in Locations of Diversions	<u>5</u>	_____
Actions:		
-Relocate Delta export pumps from key habitats	_____	_____
-Relocate other in-Delta diversions for more reliable supplies	_____	_____
-Consolidate in-Delta agricultural diversions	_____	_____
-Relocate upstream diversions from key habitats	_____	_____
-Improve diversion designs when relocating	_____	_____
Action Categories to Increase Supply Predictability		
Water Transfers	<u>5</u>	<u>C</u>
Actions:		
-Modify Water Code to ease transfers	_____	_____
-Improve procedures for transfer permitting	_____	_____
-Coordinate diversion and conveyance of transfers	_____	_____

	Importance 1 - 5	Core Action C
Long-Term Planning for Drought Contingencies	<u>5</u>	<u>C</u>
Actions:		
-Increase water storage capacities at user locations	_____	_____
-Establish incentives for long-term planning	_____	_____
-Conduct Integrated Resources Planning	_____	_____
-Establish incentives for long-term conservation	_____	_____
-Develop alternate supplies for drought situations	_____	_____
Water Resources Data and Information Management	<u>4</u>	Need Linkage w/flow management
Actions:		
-Establish a comprehensive water data system	_____	_____
-Implement real-time data management system	_____	_____
-Integrate data for adaptive management decisions	_____	_____
-Establish accessible data management system	_____	_____
Establishment of Institution for Integrated Long-Term Water Management	<u>5</u>	<u>C</u>
Actions:		
-Establish long-term guarantees for management	_____	_____
-Establish institution to implement guarantees	_____	_____
-Coordinate multiagency roles in management	_____	_____
-Coordinate groundwater and surface water management	_____	_____
-Establish incentives for cooperation/coordination	_____	_____
-Establish a public awareness and education program	_____	_____
Establishment of Export Capacity Market	<u>4</u>	_____
Actions:		
-Establish procedures for allocation of export capacity	_____	_____
-Establish institution to allocate export capacity	_____	_____
-Coordinate water transfers and export capacity	_____	_____
-Market export capacity for environmental benefits	_____	_____
Integration of Land Use and Water Supply Planning	<u>4</u>	_____
Actions:		
-Coordinate land uses with water supplies	_____	_____
-Encourage local determination of supplies available	_____	_____
-Encourage local assessment of water supply reliability	_____	_____

Core
Importance Action
1 - 5 C

Action Categories for Managing Water Quality

	5	
Installation and Operation of Flow Barriers		
Actions:		
-Install flow barriers to manage south Delta quality		
-Install weirs to control salinity intrusion		
Management of Agricultural Drainage	5	
Actions:		
-Implement source control regulations for pollutants		
-Implement pollutant-load limits in San Joaquin River		
-Reduce or control volume of agricultural discharges		
-Modify cropping and irrigation practices		
-Export agricultural drainage to other watersheds		
-Retire lands with drainage disposal problems		
-Improve pest-control practices		
-Avoid use of high-salinity irrigation water		
-Manage irrigation tailwater to reduce pesticides		
-Manage drainage timing to reduce instream impacts		
-Treat drainage to remove salt or other pollutants		
-Dilute pollutants in Delta inflows from SJR using stored water		
Management of Urban/Industrial Drainage and Wastewater Discharge	5	
Actions:		
-Retain and manage stormwater runoff		
-Implement urban awareness/education programs		
-Treat discharges to remove problem constituents		
-Construct wetlands to treat wastewater effluent		
-Increase key nutrient inputs to estuary		
-Enforce wastewater discharge requirements		
-Prevent toxic discharges from industrial plants		
Dredged Material Management	3	
Actions:		
-Limit dredging to slack tides		
-Limit dredging to avoid fish migration periods		
-Use techniques to localize sediment movement		
-Dispose dredged materials at nonaquatic or other suitable sites		
-Remove contaminated sediments in critical habitat sites		
-Ensure material used for levee maintenance is noncontaminated		

	Importance 1 - 5	Core Action C
Management of Abandoned-Mine Drainage	<u>5</u>	<u>C</u>
Actions:		
-Manage discharges from abandoned mines	_____	_____
-Remediate abandoned mining sites discharging pollutants	_____	_____

Action Categories for Improving System Reliability

Levee Maintenance and Stabilization	<u>3</u>	Depends on isolated facility or through Delta
Actions:		
-Maintain and stabilize existing levees	_____	_____
-Modify agricultural practices to reduce subsidence	_____	_____
-Use infilling to correct past subsidence	_____	_____
-Implement uniform maintenance standards	_____	_____
-Provide funding for maintenance and stabilization	_____	_____
Improvement of Flood Protection Levels and Seismic Stabilities	<u>3</u>	
Actions:		
-Reconstruct levees to higher design standards	_____	_____
-Reconstruct levees to higher seismic standards	_____	_____
-Relocate levees to more stable sites	_____	_____
-Widen floodways to increase flood conveyance	_____	_____
-Establish and manage flood overflow areas	_____	_____
Rerouting and Protection of Infrastructure from Flooding and Seismic Risk	<u>3</u>	
Actions:		
-Maintain/reconstruct levees around infrastructure	_____	_____
-Reconstruct infrastructure to increase reliability	_____	_____
-Relocate/reroute infrastructure	_____	_____
Establishment of Long-Term Funding Mechanisms	<u>3</u>	
Actions:		
-Establish a disaster contingency funding program	_____	_____
-Establish a Bay-Delta financing authority	_____	_____
-Provide low-cost debt financing for local agencies	_____	_____
-Establish a bond financing mechanism	_____	_____
-Establish a statewide water utility surcharge	_____	_____

COMMENTS:**1. Format of response:**

Some of the actions within an action category have not been ranked with a numeric score because more information is needed before a score can be arrived at. The numeric score given to the action category is intended to indicate an overall ranking of that category of actions while the details are being developed.

2. Linkages:

Generally, all of the actions that comprise an alternative need to be linked in order to function together as a comprehensive set of solutions. However, some of the action categories need to be linked particularly with other action categories to function effectively as an alternative. Specifically, actions regarding Delta inflows would need to be linked with other regulatory programs such as: CVPIA, F&G, and FERC which require operational modifications to provide instream flows. Actions regarding Delta diversions and outflows, modification of diversion timing patterns, and increasing rates of diversion capacity would need to be linked with actions to increase or enhance storage. Delta inflow/outflow/export management actions need to be linked with water resources data and information management.

3. Reasonable Levels of Implementation:

A guiding principle in selecting actions for reducing reliance on Delta exports is to apply the criteria of reasonableness and implementability. A reasonable level of demand management that can be widely implemented, coupled with other actions, should be core to all of the alternatives and would likely be supported by all interests.

4. Levee Improvements:

The numeric scores given to action categories for improving system reliability depend on the selection between improving through-Delta conveyance or constructing an isolated transfer system. This is another example that action categories need to be linked in formulating alternative solutions.