List of Action Categories and Actions

JAN 05 1996

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

* See comments

E-012052

		Importance 1 - 5	Core Action C
Restoration of Bay-Delta System Wetland Habitat 3		3	
Actions:	-Restore, enhance, and create wetlands 3	3	
	-Expand wetland acquisition programs 3	3	
	-Convert agricultural lands to wetlands 1	1	
	-Protect existing wetland habitat 5	5	C
Restoration of Bay-Delta System Terrestrial Habitat 1		1	
Actions:	-Protect existing upland habitat 1	1	
	-Establish upland habitat on levees 3	3	
	-Establish upland habitat on fallowed croplands 2	2	
	-Establish oak woodlands on suitable soils 2	2	
	-Encourage wildlife-friendly agricultural practices 1	1	
	-Preserve agricultural land uses providing habitat 2	2	
	-Clean up sites contaminated with toxic substances 5	5	
Implementation of Integrated Habitat Management Programs 4		4	
Actions:	-Establish regional ecosystem restoration guidelines 2	2	
	-Implement integrated regional habitat management 4	4	
	-Develop cooperative management agreements 4	4	
	-Establish mitigation banking program 5	5	
Establishment of Floodways and Meander Belts 1		1	
Actions:	-Relocate levees to widen floodways ?	*	
	-Allow river channels to meander 1	1	
	-Acquire Delta islands as overflow areas 3	3	
	-Restore floodways as habitat corridors 1	1	
Control of Introduced Species 5		5	C
Actions:	-Remove or reduce nuisance species in key habitats 5	5	C
	-Improve regulation of ballast-water releases 4	4	
	-Improve border inspection practices 3	3	
	-Inspect for invasions of nuisance species 4	4	
	-Modify habitat to favor native species 3	3	

* See Comments

E-012053

		Importance 1 - 5	Core Action C
Delta Waterfowl Habitat Management	4	4	
Actions: -Manage agricultural crops for waterfowl forage production	3	3	
-Improve management of public waterfowl areas	4	4	
-Implement terrestrial predator control programs	4	4	
-Increase sources and availability of wildlife forage	4	4	

Action Categories to Restore Upstream Habitat

Restoration of Upstream Anadromous Fish Habitat	5	5	
Actions: -Manage flows and temperatures in upstream habitats	5	5	
-Restore and replenish spawning gravels	4	4	
-Restore channel configurations	2	2	
-Restore shoreline habitat conditions	2	2	
-Modify gravel mining practices	3	3	
-Improve floodway drainage to reduce fish stranding	4	4	
Improvements for Upstream Fish Passage	5	5	
Actions: -Modify passage at upstream dams and other barriers	4	4	
-Modify natural barriers to improve passage	5	5	
Restoration of Upstream Riparian Habitat	3	3	
Actions: -Restrict livestock grazing in riparian corridors	1	1	
-Revegetate degraded riparian habitats	4	4	
-Protect riparian lands through purchase/easements	3	3	
-Restore flows to dewatered riparian habitats	4	4	
Restoration of Upstream Wetland Habitat	4	4	
Actions: -Modify floodways to support wetland habitats	3	3	
-Reuse agricultural drainage to create wetlands	1	1	
-Reuse urban wastewater effluent to create wetlands	3	3	
-Manage groundwater recharge for wetland habitat	1	1	

E-012054

	Importance 1 - 5	Core Action C
Action Categories to Reduce Effects of Diversions		
Delta Inflow/Outflow/Export Management 5	5	C
Actions regarding Delta Inflows:		
-Modify upstream consumptive use 5	5	C
-Modify upstream reservoir operations criteria 5	5	
-Modify Delta inflow timing pattern 5	5	
-Provide instream pulse flows for fish passage 4	4	
-Provide instream flows for fish attraction 4	4	
Actions regarding Delta Diversions and Outflows:		
-Modify volumes and timing of exports 5	5	C
-Modify in-Delta consumptive use 5	5	C
-Modify central Delta channel operations 2	2	
-Modify export operations criteria 5	5	C
-Establish a Delta watermaster to manage flows 1	1	
-Use real-time monitoring and adaptive management 5	5	C
Modification of Diversion Timing Patterns 4	4	
Actions: -Modify diversion timing of in-Delta diversions 3	3	
-Modify diversion timing of export diversions 4	4	
-Coordinate SWP/CVP diversion timing 5	5	C
-Modify diversion timing through Montezuma Salinity Control Gate 2	2	
-Use real-time monitoring and adaptive management 5	5	C
Increased Rates of Diversion Capacity 2	2	
Actions: -Obtain approvals for expanded export capacities 2	2	
-Enlarge export pumping capacities 1	1	
-Increase diversion capability at Red Bluff Diversion Dam 2 2	2	
Acquisition of Long-Term Water Supplies for Fish and Wildlife 2	2	
Actions: -Acquire water to augment instream flows 1	1	
-Obtain shifts in timing of instream flows 3	3	
-Obtain shifts in diversion timing patterns 4	4	

E-012055

	Importance 1 - 5	Core Action C
-Acquire water for refuge habitat use 1	1	
-Modify water law to establish instream rights 3	3	
Installation and Improvement of Fish Screens 5	5	C
Actions: -Improve screens at Delta export pumps 5	5	
-Improve other existing fish screen systems 5	5	
-Install screens on other in-Delta diversions 5	5	
-Install screens on upstream diversions 5	5	
-Consolidate and screen existing small diversions 5	5	
-Enforce screening requirements 5	5	
Improvement of Bay-Delta System Fish Migration 4	4	
Actions: -Install barriers to block fish movement into Old River 4	4	
-Install barriers to keep fish in Sacramento River 4	4	
-Install barriers to divert fish from Sacramento River to western distributaries 2	2	
-Operate fish barrier on San Joaquin River at Merced River confluence in fall 3	3	
-Provide instream pulse flows for fish passage 4	4	
-Provide instream flows for fish attraction 4	4	
Improvement of Fish Salvage Operations 2	2	
Actions: -Improve design of salvage facilities 2	2	
-Improve operation of salvage facilities 2	2	
-Improve fish hauling and release procedures 2	2	
Removal and Control of Aquatic Predators 5	5	
Actions: -Harvest predators at Delta export pumps 4	4	
-Harvest predators in upstream habitats 5	5	

Action Categories to Manage the Enhancement of Anadromous Fish Populations

Fish Hatchery Operations 5	5	
Actions: -Expand hatchery capacities 5	5	
-Construct new hatcheries on the San Joaquin River 3	3	
-Improve hatchery operations 5	5	

		Importance 1 - 5	Core Action C
-Reduce hatchery effects on wild fish populations 3		3	
-Implement tagging of hatchery-bred fish 3		3	
-Establish new captive breeding programs 4		4	
Fish Harvest Management	3	3	
Actions: -Improve regulation of commercial take 3		3	
-Improve regulation of recreational take 3		3	
-Improve enforcement of harvest regulations 4		4	

Action Categories for Reducing Reliance on Delta Exports

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

* see comments

E-012057

		Importance 1 - 5	Core Action C
Land Retirement and Fallowing	4	4	
Actions: -Encourage land fallowing during drought periods	3	3	
-Develop incentive programs for land retirement	4	4	
-Purchase lands or easements	2	2	
-Retire lands with drainage problems	4	4	
Water Pricing	5	5	C
Actions: -Establish incentives for pricing to reduce demand	3	3	
-Educate users about pricing feasibility	5	5	
-Remove legal obstacles to pricing incentive programs	5	5	

Action Categories to Enhance Water Supplies

Watershed Management	5	5	C
Actions: -Manage vegetation cover to increase yield	5	5	
-Manage riparian zones to protect water quality	5	5	
-Manage land uses to reduce sedimentation	5	5	
-Modify weather to increase precipitation	?	*	
New or Expanded Onstream Storage	5	5	C
Actions: -Construct new storage facilities south of the Delta	5	5	
-Construct new storage facilities north of the Delta	5	5	
-Enlarge existing onstream storage reservoirs	5	5	
-Modify operations of existing onstream reservoirs	3	3	
New or Expanded Offstream Storage	5	5	C
Actions: -Construct new storage facilities south of the Delta	5	5	
-Construct new storage facilities north of the Delta	5	5	
-Construct new storage facilities in Delta	5	5	
-Enlarge existing offstream storage reservoirs	5	5	
-Modify operations of existing offstream reservoirs	3	3	
Groundwater Banking and Conjunctive Use	5	5	C
Actions: -Establish incentives for conjunctive use	5	5	
-Modify Water Code to encourage conjunctive use	5	5	
-Establish conjunctive use programs	5	5	

* see comments

E-012058

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

Action Categories to Increase Supply Predictability

Water Transfers 5		5	C
Actions:	-Modify Water Code to ease transfers 5	5	
	-Improve procedures for transfer permitting 5	5	
	-Coordinate diversion and conveyance of transfers 5	5	

E-012059

	Importance 1 - 5	Core Action C
Long-Term Planning for Drought Contingencies 5	5	C
Actions: -Increase water storage capacities at user locations 5	5	
-Establish incentives for long-term planning 5	5	
-Conduct Integrated Resources Planning 5	5	
-Establish incentives for long-term conservation 5	5	
-Develop alternate supplies for drought situations 5	5	
Water Resources Data and Information Management 5	5	C
Actions: -Establish a comprehensive water data system 5	5	C
-Implement real-time data management system 5	5	C
-Integrate data for adaptive management decisions 5	5	C
-Establish accessible data management system 5	5	C
Establishment of Institution for Integrated Long-Term Water Management 5 5		C
Actions: -Establish long-term guarantees for management 5	5	C
-Establish institution to implement guarantees 5	5	C
-Coordinate multiagency roles in management 5	5	
-Coordinate groundwater and surface water management 5 5		
-Establish incentives for cooperation/coordination 5	5	
-Establish a public awareness and education program 5	5	
Establishment of Export Capacity Market 5	5	
Actions: -Establish procedures for allocation of export capacity 5	5	
-Establish institution to allocate export capacity 5	5	
-Coordinate water transfers and export capacity 5	5	
-Market export capacity for environmental benefits 1	1	
Integration of Land Use and Water Supply Planning 3	3	
Actions: -Coordinate land uses with water supplies 4	4	
-Encourage local determination of supplies available 3	3	
-Encourage local assessment of water supply reliability 5 5	5	

	Importance 1 - 5	Core Action C
Action Categories for Managing Water Quality		
Installation and Operation of Flow Barriers 2	2	
Actions: -Install flow barriers to manage south Delta quality 2	2	
-Install weirs to control salinity intrusion 2	2	
Management of Agricultural Drainage 5	5	C
Actions: -Implement source control regulations for pollutants 5	5	
-Implement pollutant-load limits in San Joaquin River 5	5	
-Reduce or control volume of agricultural discharges 5	5	
-Modify cropping and irrigation practices 5	5	
-Export agricultural drainage to other watersheds 1	1	
-Retire lands with drainage disposal problems 4	4	
-Improve pest-control practices 4	4	
-Avoid use of high-salinity irrigation water 5	5	
-Manage irrigation tailwater to reduce pesticides 5	5	
-Manage drainage timing to reduce instream impacts 5	5	
-Treat drainage to remove salt or other pollutants ?	*	
-Dilute pollutants in Delta inflows from SJR using stored water 3	3	
Management of Urban/Industrial Drainage and Wastewater Discharge 3	3	
Actions: -Retain and manage stormwater runoff 3	3	
-Implement urban awareness/education programs 4	4	
-Treat discharges to remove problem constituents 4	4	
-Construct wetlands to treat wastewater effluent 3	3	
-Increase key nutrient inputs to estuary 2	2	
-Enforce wastewater discharge requirements 5	5	
-Prevent toxic discharges from industrial plants 5	5	
Dredged Material Management 4	4	
Actions: -Limit dredging to slack tides 4	4	
-Limit dredging to avoid fish migration periods 4	4	
-Use techniques to localize sediment movement 4	4	
-Dispose dredged materials at nonaquatic or other suitable sites 4	4	
-Remove contaminated sediments in critical habitat sites 5	5	
-Ensure material used for levee maintenance is noncontaminated 5	5	

* See comments

E-012061

	Importance 1 - 5	Core Action C
Management of Abandoned-Mine Drainage ?	*	
Actions: -Manage discharges from abandoned mines ?	*	
-Remediate abandoned mining sites discharging pollutants ?	*	

Action Categories for Improving System Reliability

Levee Maintenance and Stabilization 5	5	C
Actions: -Maintain and stabilize existing levees 5	5	C
-Modify agricultural practices to reduce subsidence 5	5	
-Use infilling to correct past subsidence 5	5	
-Implement uniform maintenance standards 3	3	
-Provide funding for maintenance and stabilization 5	5	
Improvement of Flood Protection Levels and Seismic Stabilities ?	*	
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 2	2	
Rerouting and Protection of Infrastructure from Flooding and Seismic Risk 5	5	
Actions: -Maintain/reconstruct levees around infrastructure 5	5	
-Reconstruct infrastructure to increase reliability 3	3	
-Relocate/reroute infrastructure 3	3	
Establishment of Long-Term Funding Mechanisms 5	5	
Actions: -Establish a disaster contingency funding program 5	5	
-Establish a Bay-Delta financing authority 4	4	
-Provide low-cost debt financing for local agencies 5	5	
-Establish a bond financing mechanism 5	5	
-Establish a statewide water utility surcharge 5	5	

* See comments

E-012062

* COMMENTS: Without knowing the technical or economic feasibility of these proposed actions, it is meaningless to assign an importance. If the action is unrealistic, it is unimportant to the solution. The items marked with a * raise questions, to me, of economic and/or technical feasibility. They appear to me to be physically or technically unrealistic, or prohibitively expensive. If I am incorrect and any or all of these actions are feasible, I would rank those with demonstrated feasibility as very important.

E-012063