List of Action Categories and Actions

Comments on Action Categories and Actions

Fax return by January 10, 1996 to (916) 654-9780
or mail to 1416 Ninth Street, Room 1155
Sacramento, CA 95814

Name: Alex Hildebrand

	Importance 1 - 5	Core Action C
Action Categories to Restore Bay-Delta System Habitats		
Restoration of Bay-Delta System Shallow Water (Tidal) Habitat	____	____
Actions: -Convert existing leveed lands to tidal action What lands?	____	____
-Protect existing shallow habitat from erosion e.g. channel islands	Yes	C
-Restore tidal action to existing diked wetlands What lands?	____	____
-Reconstruct levees to include shallow water habitat Where & how. Probably	yes	____
-Fill deep water to produce shallow habitat	No	____
Restore shallow habitat lost to aquatic exotic plants		
Restoration of Bay-Delta System Riverine Habitat Where & how?	____	____
Actions: -Reconstruct river banks and shallow areas	____	____
-Restore and preserve channel islands	____	C
-Restore natural channel configurations where and for what gain		
-Modify channel/levee construction practices to include riverine elements Where, how, with what impacts?	____	____
Restoration of Bay-Delta System Riparian Habitat Where & how?	____	____
Actions: -Improve and protect degraded riparian habitats ?	____	____
-Establish new areas of riparian habitat	____	____
-Reestablish historic riparian areas ?	____	____
-Modify levee maintenance practices ?	____	____
-Protect existing riparian habitat ! Probably yes	____	____
Reestablish where & at what level?		

		Importance 1 - 5	Core Action C
Restoration of Bay-Delta System Wetland Habitat		____	____
Actions:	-Restore, enhance, and create wetlands where and with what impacts	____	____
	-Expand wetland acquisition programs	____	____
	-Convert agricultural lands to wetlands only in special situations	____	____
	-Protect existing wetland habitat Usually yes but must protect from exotics	____	____
Restoration of Bay-Delta System Terrestrial Habitat		____	____
Actions:	-Protect existing upland habitat	____	____
	-Establish upland habitat on levees Usually impractical	____	____
	-Establish upland habitat on fallowed croplands Depends on crop situation	____	____
	-Establish oak woodlands on suitable soils Displacement of other use?	____	____
	-Encourage wildlife-friendly agricultural practices OK	____	____
	-Preserve agricultural land uses providing habitat	____	____
	-Clean up sites contaminated with toxic substances where toxic problem is real (How?)	____	____
Implementation of Integrated Habitat Management Programs		____	____
Actions:	-Establish regional ecosystem restoration guidelines	____	____
Land use regulation must not overfurnp rivate rights & must be coordinated with water right protection	-Implement integrated regional habitat management	____	____
	-Develop cooperative management agreements	____	____
	-Establish mitigation banking program	____	____
Establishment of Floodways and Meander Belts It is no longer often feasible to restore meander belts.		____	____
Actions:	-Relocate levees to widen floodways Sometimes OK	____	____
	-Allow river channels to meander Usually not	____	____
	-Acquire Delta islands as overflow areas Limited potential without jeopardy to Delta configurat.	____	____
	-Restore floodways as habitat corridors Should be done where feasible.	____	____
Control of Introduced Species Very important		____	C
Actions:	-Remove or reduce nuisance species in key habitats	____	C
	-Improve regulation of ballast-water releases	____	C
	-Improve border inspection practices	____	C
	-Inspect for invasions of nuisance species	____	C
	-Modify habitat to favor native species	____	C

E-011808

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

Action Categories to Restore Upstream Habitat

Restoration of Upstream Anadromous Fish Habitat		____	C
Actions:	-Manage flows and temperatures in upstream habitats	Where feasible	
	-Restore and replenish spawning gravels	____	C
	-Restore channel configurations	Where & how ____	____
	-Restore shoreline habitat conditions	" " ____	____
	-Modify gravel mining practices	" " ____	____
	-Improve floodway drainage to reduce fish stranding	Yes where needed	
Improvements for Upstream Fish Passage		____	____
Actions:	-Modify passage at upstream dams and other barriers	Where & how?	
	-Modify natural barriers to improve passage	" ____	" ____
Restoration of Upstream Riparian Habitat		____	____
Actions:	-Restrict livestock grazing in riparian corridors	in some places	
	-Revegetate degraded riparian habitats	" " ____	" ____
	-Protect riparian lands through purchase/easements	" " ____	" ____
	-Restore flows to dewatered riparian habitats	Depends on source of water	
Restoration of Upstream Wetland Habitat		____	____
Actions:	-Modify floodways to support wetland habitats	where compatible with restoration of "design" flood flow capacity.	
	-Reuse agricultural drainage to create wetlands	____	____
	-Reuse urban wastewater effluent to create wetlands	____	____
	-Manage groundwater recharge for wetland habitat	____	____

These often cause problems of salinity in groundwater and/or downstream flows. Long term salt balance must always be preserved. This does not mean that there are no suitable opportunities.

	Importance 1 - 5	Core Action C

Action Categories to Reduce Effects of Diversions

Delta Inflow/Outflow/Export Management ____ ____

Actions regarding Delta Inflows:

Stabilize -Modify upstream consumptive use ____ ____
-Modify upstream reservoir operations criteria ? Build more capacity
-Modify Delta inflow timing pattern At whose expense? ____
-Provide instream pulse flows for fish passage Yes but how much?
-Provide instream flows for fish attraction Yes but how much?

Actions regarding Delta Diversions and Outflows:

-Modify volumes and timing of exports Yes but how much and with what consequences?
-Modify in-Delta consumptive use Not appropriate ____
-Modify central Delta channel operations How? ____ ____
-Modify export operations criteria How? ____ ____
-Establish a Delta watermaster to manage flows Doubtfull ____
-Use real-time monitoring and adaptive management Yes ____

Modification of Diversion Timing Patterns ____ ____

Actions:
-Modify diversion timing of in-Delta diversions Not feasible ____
-Modify diversion timing of export diversions See above ____
-Coordinate SWP/CVP diversion timing Yes ____
-Modify diversion timing through Montezuma Salinity Control Gate Yes ____
-Use real-time monitoring and adaptive management Yes ____

Increased Rates of Diversion Capacity ____ ____

Actions:
-Obtain approvals for expanded export capacities where appropriate
-Enlarge export pumping capacities Perhaps ____ ____
-Increase diversion capability at Red Bluff Diversion Dam ____ ____

Acquisition of Long-Term Water Supplies for Fish and Wildlife ____ ____

Actions:
-Acquire water to augment instream flows from whom and what side effects? ____
-Obtain shifts in timing of instream flows at whose expense? ____
-Obtain shifts in diversion timing patterns by whom? ____ ____

	Importance 1 - 5	Core Action C
-Acquire water for refuge habitat use from whom? What effect on return flows?	____	____
-Modify water law to establish instream rights Probably not	____	____
Installation and Improvement of Fish Screens	____	____
Actions: -Improve screens at Delta export pumps OK	____	____
-Improve other existing fish screen systems	____	____
-Install screens on other in-Delta diversions ?	____	____
-Install screens on upstream diversions who pays?	____	____
-Consolidate and screen existing small diversions Seldom practical	____	____
-Enforce screening requirements who pays?	____	____
Improvement of Bay-Delta System Fish Migration	____	____
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 yes	____	____
-Provide instream pulse flows for fish passage effect not yet proven	____	____
-Provide instream flows for fish attraction at what level?	____	____
Improvement of Fish Salvage Operations	____	____
Actions: -Improve design of salvage facilities	____	____
-Improve operation of salvage facilities	____	____
-Improve fish hauling and release procedures	____	____
Removal and Control of Aquatic Predators Probably	____	____
Actions: -Harvest predators at Delta export pumps	____	____
-Harvest predators in upstream habitats	____	____

Sonic devises, etc, will often be more practical

There are no viable designs for many situations due to trash problems, lack of unidirectional flow, etc. Submerged small turbine pumps entrain very few fish.

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: probably. Needs study

Actions: -Improve design of salvage facilities, -Improve operation of salvage facilities, -Improve fish hauling and release procedures: Probably but how?

Actions: -Harvest predators at Delta export pumps, -Harvest predators in upstream habitats: Probably, including striped bass

Action Categories to Manage the Enhancement of Anadromous Fish Populations

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

Actions: -Expand hatchery capacities, -Construct new hatcheries on the San Joaquin River, -Improve hatchery operations: Probably yes

		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	___	___
	-Improve regulation of recreational take	Probably	___
	-Improve enforcement of harvest regulations	___	___

Action Categories for Reducing Reliance on Delta Exports

Desalination		Seldom economic except for drinking water	
Actions:	-Expand desalination of Southern California supplies	perhaps for brackish water	
	-Expand desalination of San Joaquin Valley supplies	as part of salt disposal to ocean	
	-Improve desalination technologies and cost	yes, but this is no panacea	
	-Educate users about desalination feasibility	and limitations	___
Water Conservation		___	___
Actions:	-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 conservation-oriented rate structures	___	___
	-Educate users about conservation technologies	___	___
Water Reclamation		___	___
Actions:	-Recharge groundwater with reclaimed water	causes salt problem.	
	-Use reclaimed water for agricultural irrigation	limited due salt problem	
	-Reclaim saline agricultural drainage water	with provision for salt disposal	
	-Recycle and treat water for potable reuse	with reverse osmosis	
	-Use reclaimed water for nonpotable urban uses	Yes	___
	-Use reclaimed water for landscape irrigation	Yes	___
	-Use reclaimed water for power plant cooling	Yes	___
	-Use reclaimed water for industrial processes	depends on use	
	-Use reclaimed water to repel salinity intrusion	Yes	___
	-Improve reclamation technologies and cost	Yes	___
	-Educate public about water reclamation	Yes	___

All this has to be limited by effect on salinity and long term salt disposal.

See note above

		Importance 1 - 5	Core Action C
Land Retirement and Fallowing		____	____
Actions:	-Encourage land fallowing during drought periods agric. can't be farmed on and off	____	____
	-Develop incentive programs for land retirement	____	____
	-Purchase lands or easements	____	____
	-Retire lands with drainage problems only in extreme cases	____	____
Water Pricing		____	____
Actions:	-Establish incentives for pricing to reduce demand	____	____
	-Educate users about pricing feasibility and infeasibility	____	____
	-Remove legal obstacles to pricing incentive programs	____	____

The State can't afford to go on destroying its food production.

If we reduce consumptive use we loose product, If we reduce only excess application we usually exacer

Action Categories to Enhance Water Supplies

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

Include new storage on Kings

Include Friant & Pine Flat

Look at all opportunities to increase yield, particularly south of Delta.

E-011813

	Importance 1 - 5	Core Action C
-Store groundwater south of the Delta	5	C
-Store groundwater north of the Delta		C
-Implement techniques to increase groundwater recharge		C
Improvement of Through-Delta Conveyance		
Actions: -Increase capacities of existing east-side channels	5	C
-Increase flows from the Sacramento River to the central Delta *in controlled manner*	5	C
-Modify Delta levees to increase flow cross sections	probably	
-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		
Actions: -Construct east-side isolated transfer system	Consider part way	
-Construct west-side isolated transfer system		
-Construct small isolated transfer facility	No	
-Convert Delta islands to storage/conveyance system	Doubtfull	
-Construct conveyance to offstream storage	?	
-Construct conveyance to groundwater storage	?	
Changes in Locations of Diversions		
Actions: -Relocate Delta export pumps from key habitats	? Where	
-Relocate other in-Delta diversions for more reliable supplies	Doubtfull	
-Consolidate in-Delta agricultural diversions	Doubtfull	
-Relocate upstream diversions from key habitats	How?	
-Improve diversion designs when relocating	How?	

Emphasis should be on moving Sac. water to the central Delta with fewer fish. Operable channel flow constrictors can partially control cross flow and distribute westward flow of excess water.

Action Categories to Increase Supply Predictability

Water Transfers		
Actions: -Modify Water Code to ease transfers	only if third parties can still be fully protected.	
-Improve procedures for transfer permitting		
-Coordinate diversion and conveyance of transfers		

Remember that transfers merely reallocate shortages. For every gainer there is a loser.

The timing of transfers can help preserve summer flow and quality.

E-011814

		Importance 1 - 5	Core Action C
Long-Term Planning for Drought Contingencies		____	____
Actions:	-Increase water storage capacities at user locations	5	C
	-Establish incentives for long-term planning	5	C
	-Conduct Integrated Resources Planning ?	____	____
	-Establish incentives for long-term conservation	____	____
	-Develop alternate supplies for drought situations (from whom?)	____	____
Water Resources Data and Information Management		____	____
Actions:	-Establish a comprehensive water data system	Yes	____
	-Implement real-time data management system	Yes	____
	-Integrate data for adaptive management decisions	Yes	____
	-Establish accessible data management system	Yes	____
Establishment of Institution for Integrated Long-Term Water Management		___	____
Actions:	-Establish long-term guarantees (of what?) for management	____	____
	-Establish institution to implement guarantees	____	____
	-Coordinate multiagency roles in management	____	____
	-Coordinate groundwater and surface water management	Yes	C
	-Establish incentives for cooperation/coordination	____	____
	-Establish a public awareness and education program	____	____
Establishment of Export Capacity Market (What is this?)		____	____
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		____	____
Actions:	-Coordinate land uses with water supplies	Yes	____
	-Encourage local determination of supplies available	Yes	____
	-Encourage local assessment of water supply reliability	Yes	____

There is no way to protect potential losers from condemnation and emergency powers of government, except by physical limitations.

	Importance 1 - 5	Core Action C
Action Categories for Managing Water Quality		
Installation and Operation of Flow Barriers	5	C
Actions: -Install flow barriers to manage south Delta quality	5	C
-Install weirs to control salinity intrusion *what is this?*		
Management of Agricultural Drainage		
Actions: -Implement source control regulations for pollutants		
-Implement pollutant-load limits in San Joaquin River		
-Reduce or control volume of agricultural discharges	No	
-Modify cropping and irrigation practices	No	
-Export agricultural drainage to ~~other watersheds~~ *ocean*		
-Retire lands with drainage disposal problems *in severe cases*		
-Improve pest-control practices	No	
-Avoid use of high-salinity irrigation water	No	
-Manage irrigation tailwater to reduce pesticides	No	
-Manage drainage timing to reduce instream impacts	Yes	C
-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		
Actions: -Retain and manage stormwater runoff	Yes	
-Implement urban awareness/education programs		
-Treat discharges to remove problem constituents	perhaps	
-Construct wetlands to treat wastewater effluent	perhaps	
-Increase key nutrient inputs to estuary		
-Enforce wastewater discharge requirements		
-Prevent toxic discharges from industrial plants		
Dredged Material Management		
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	*strengthen levees*	
-Remove contaminated sediments in critical habitat sites	? *is this areal problem?*	
-Ensure material used for levee maintenance is noncontaminated	*This is not clearly a problem*	

The problem is the salt load that enters the river at salinities above the Vernalis standard. It must be controlled to enter only when fish flows, power releases, etc are sufficient to dilute it without releases for the purpose of dilution unless from the DMC. This applies to drainage from wetlands as well as from ag lands.

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

Action Categories for Improving System Reliability

Levee Maintenance and Stabilization		5	C
Actions:	-Maintain and stabilize existing levees	5	C
	-Modify agricultural practices to reduce subsidence	?	
	-Use infilling to correct past subsidence	in some places	
	-Implement uniform maintenance standards	5	C
	-Provide funding for maintenance and stabilization	5	C
Improvement of Flood Protection Levels and Seismic Stabilities		5	C
Actions:	-Reconstruct levees to higher design standards	selectively	
	-Reconstruct levees to higher seismic standards	selectively	
	-Relocate levees to more stable sites	selectively but not much	
	-Widen floodways to increase flood conveyance	in a few places	
	-Establish and manage flood overflow areas	?	
Rerouting and Protection of Infrastructure from Flooding and Seismic Risk		what infrastructure?	
Actions:	-Maintain/reconstruct levees around infrastructure		
	-Reconstruct infrastructure to increase reliability		
	-Relocate/reroute infrastructure		
Establishment of Long-Term Funding Mechanisms			
Actions:	-Establish a disaster contingency funding program	5	C
	-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		

Dredging and levee work are needed in the Mokelumne channels and there needs to be control of flow through Georgiana Slough during Commencus rain flow peaks.

COMMENTS: There are many definitions, limitations, and qualifications involved in intelligent answers to this questionaire. I think it would be more productive to supply most of that in a questionnaire and then give the responder an opportunity to agree, disagree, or expand. It is difficult to get meaningfull response without having a "white paper" as a point of departure.

Alex Hildebrand

12/28