

STRESSOR RANKINGS

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The various ranking results from each of the technical teams were normalized on a scale from 1 to 10, with 10 being the most important stressor and 1 being the least important. In cases where a technical team's stressor terminology or level of detail differed from the final terminology and subcategories agreed to by the Umbrella Team, the corresponding technical team stressor rank was assigned to the most closely related Umbrella Team subcategory. A "--" symbol in the ranking matrix indicates the stressor subcategory is not applicable, was not addressed by the technical team, or related concerns were better characterized under some other stressor subcategory.

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Stressor Categories	Stressor Subcategories	Description of Stressors	System-wide Ranking	Stanislaus and Lower San Joaquin Rivers	Merced, Tuolumne, and Middle San Joaquin Rivers	Sacramento Mainstem	Sacramento Tributaries	American River	North Bay	Delta	Suisun Marsh	Delta Eastside Tributaries
Alteration of Flows and Other Effects of Water Management	Hydrograph Alterations	Inadequate flow, flow variability, seasonal flow distribution, flow timing, stranding due to flow fluctuation, lack of flushing flows, lack of attraction flows, lack of channel forming flows, saltwater intrusion.	9	6	10	7	10	10	5	10	4	10
	Entrainment	Unscreened diversions, impingement, diversions not screened to current standards.	6	1	10	7	10	--	--	9	8	5
	Migration Barriers, Straying	Migration barriers or delays caused by physical structures, insufficient flow over shallow areas, inadequate attraction flows, adverse water quality conditions, delayed flooding of marshlands, or other factors.	4	3	--	7	10	9	3	5	1	1
Floodplain and Marshplain Changes	Hydrological isolation of floodplain or marshplain	Lack of flow over floodplains and marshplains, lack of return flow to main channel.	8	10	8	10	3	6	5	8	10	7
	Physical isolation of floodplain or marshplain	Habitat fragmentation, loss of seasonal and tidal wetlands due to levee construction, or other land use changes.	9	10	8	10	3	6	10	8	10	7
	Elimination of fine sediment replenishment	Loss of floodplain and marshplain fine sediment deposition, decreased food production.	1	--	--	--	--	--	3	2	--	--
	Land use changes in the floodplain or marshplain	Urbanization, agriculture, grazing.	3	--	8	10	3	--	--	3	2	--

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Channel Form Changes	Alteration of channel form	Loss of shallow water habitat, channel deepening, lack of floodplain, degradation of instream habitat conditions, loss of lotic conditions, loss of channel complexity.	10	10	8	7	5	9	2	6	10	2
	Prevention of channel meander	Channelization, loss of shallow water habitat and channel complexity, reduced gravel recruitment, riparian encroachment, bank armoring.	4	10	8	7	5	9	3	8	--	2
	Isolation or elimination of sidechannels and tributaries	Loss of woody debris recruitment, loss of rearing and spawning habitat, loss of refuge habitat, decreased food production.	2	8	8	7	5	9	--	--	10	--
	Reduction of gravel recruitment	Loss of spawning habitat, increased gravel armoring.	5	8	8	7	5	5	--	--	--	5
	Channel aggradation due to fine sediments	Accelerated erosion, changes in channel form caused by deposition of fine sediments due to increased sediment loads or decreased sediment transport capacity.	1	8	--	--	5	8	3	--	--	--
	Loss of existing riparian zone or lack of regeneration potential	Loss of food supply, loss of Shaded Riverine Aquatic (SRA) habitat, loss of channel complexity.	4	8	8	7	5	--	5	3	2	--

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Water Quality	Increased Contaminants	Acute or chronic toxicity caused by agricultural chemicals, urban runoff, mine drainage, refineries, wastewater treatment plants, and other point or non-point pollution sources.	7									
			0	--	--	--	--	--	5	7	6	--
	Increased Salinity	Increased salinity due to water management, operation of diversions or structures, runoff, etc.										
	Increased Nutrient or Carbon Input	Increased input of nutrients from ag runoff, wastewater treatment, and other sources. Includes low dissolved oxygen conditions.	1	--	--	--	--	--	--	--	--	--
	Increased Mobilization of Contaminants due to Dredging	Increased turbidity, contaminant mobilization, dredge spoil disposal.	1	--	--	--	--	--	1	0	0	0
Water Temperature		High water temperatures due to lack of riparian shade, lack of flow, increased surface area, warm water inflow, or other factors.	8	7	5	0	3	6	0	1	1	4

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Undesirable Species Interactions	Introduction of new exotic species	Introduction of exotic species from ballast water, inadvertent release of exotic species, intentional introduction of species for other reasons.	3	--	--	--	--	--	--	--	--	--
			4	3	2	1	1	7	2	6	8	1
	Elevated predation or competition losses	Striped bass predation, other introduced predatory species, competition for nest sites by introduced bird species, competition for food resources by introduced fish or mollusc species, etc.	0	--	--	1	1	--	2	6	--	1
	Competition from introduced plants	Invasive aquatic plants such as Hydrilla, invasive riparian zone plants such as Arundo, invasive salt marsh plants.	7	3	2	2	1	7	0	1	0	2
Adverse Fish and Wildlife Harvest Impacts		Ocean and freshwater overharvest, poaching, inadequate fishing regulations,										
Population Management		Migratory pathway changes, inadequate reproductive capacity due to small or non-existent spawning populations.	0	--	--	0	0	3	--	2	--	--

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Land Use	Grazing	Loss of riparian habitat, increased erosion, decreased water quality.	1	-	-	-	3	-	3	-	-	2
	Gravel mining	Decreased gravel recruitment, increased fine sediments, channel instability.	2	--	2	2	3	--	--	--	--	--
	Urbanization	Urbanization of the watershed that leads to loss of riparian habitat, habitat fragmentation, wetland drainage, and other impacts.	1	--	--	2	3	--	5	--	--	--
	Forestry and agricultural practices	Forestry and agricultural practices in the watershed that lead to conversion of floodplain to ag use, subsidence, increased erosion, loss of habitat complexity, habitat fragmentation, and water quality degradation.	1	--	2	2	3	--	5	4	5	9
Artificial Propagation of Fish		Genetic changes due to hatchery management, hybridization, altered timing of runs, effects of smolt releases on wild populations, introduction of pathogens, incidental spring run mortality, increased striped bass populations, and other factors.	2	--	1	1	1	10	--	2	--	1
Climate		Global warming and ocean conditions.	0	0	0	0	0	--	--	1	--	--
Human Disturbance		Direct disturbance of fish and wildlife populations by anglers, boaters, and other recreational users.	1	--	0	0	1	--	1	2	1	1
Wildfire		Habitat management through use of fire; increased frequency of fire near urban areas.	0	--	0	0	0	7	--	--	--	--

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Due to differences in the ranking methods, number of stressors, and number of participants for each of the technical teams, comparisons of ranks within a geographical area have a somewhat greater level of statistical validity than comparisons between geographical areas.