Winter-run Chinook Salmon Stressor Matrix

Population	Pop Weight (0-1) Sum to 1	Life Stage	Life Stage Weight (0-1) Sum to 1	Primary Stressor Category	Primary Stressor Weight (0-1) Sum to 1	Specific Stressor	Specific Stressor Weight (0-1) Sum to 1	Composite Weight (X100)	Number of Specific Stressors	Normalized Weight (Composite * # of specific stressors)	Overall Stressor Category
Sacramento River	1	Adult Immigration and holding	0.1	Passage Impediments/Barriers	0.425	Keswick/Shasta Dam	0.650	2.763	6	16.58	VH
Sacramento River	1	Spawning	0.325	Barrier	0.350	Keswick/Shasta Dam	1.000	11.375	1	11.38	VH
Sacramento River	1	Embryo Incubation	0.25	Flow Conditions	0.250	Flow Fluctuations in upper Sacramento River	1.000	6.250	1.00	6.25	VH
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Natural Morphologic Function	0.150	Loss of Natural Morphologic Function in the Delta	0.300	1.463	4	5.85	VH
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Natural Morphologic Function	0.150	Loss of Natural Morphologic Function in the lower Sacramento River	0.300	1.463	4	5.85	VH
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Riparian Habitat and Instream Cover	0.125	Loss of Riparian Habitat and Instream Cover in the Delta	0.350	1.422	4	5.69	VH
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Riparian Habitat and Instream Cover	0.125	Loss of Riparian Habitat and Instream Cover in the lower Sacramento River	0.350	1.422	4	5.69	VH
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Predation	0.150	Predation in the Delta	0.225	1.097	5	5.48	VH
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Predation	0.150	Predation in the lower Sacramento River	0.225	1.097	5	5.48	VH
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Predation	0.150	Predation in the middle Sacramento River with emphasis on anthropogenically-created predation opportunities at GCID, RBDD and other structures	0.225	1.097	5	5.48	VH
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Predation	0.150	Predation in the upper Sacramento River with emphasis on anthropogenically-created predation opportunities at ACID and other structures	0.225	1.097	5	5.48	VH
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Flow Conditions	0.125	Changes in Delta Hydrology	0.250	1.016	5	5.08	VH
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Flow Conditions	0.125	Diversion into Central Delta	0.250	1.016	5	5.08	VH
Sacramento River	1	Embryo Incubation	0.25	Short-term Inwater Construction	0.200	Sedimentation, turbidity, acoustic effects, hazardous spills, physical disturbance	1.000	5.000	1.00	5.00	VH
Sacramento River	1	Embryo Incubation	0.25	Water Quality	0.200	Water Pollution in upper Sacramento River	1.000	5.000	1.00	5.00	VH
Sacramento River	1	Embryo Incubation	0.25	Water Temperature	0.200	Water Temperature in upper Sacramento River	1.000	5.000	1.00	5.00	VH
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Natural Morphologic Function	0.150	Loss of Natural Morphologic Function in the upper Sacramento River	0.250	1.219	4	4.88	VH
Sacramento River	1	Spawning	0.325	Spawning Habitat Availability	0.150	Habitat Suitability in in upper Sacramento River	1.000	4.875	1	4.88	VH
Sacramento River	1	Spawning	0.325	Water Temperature	0.150	Upper Sacramento River	1.000	4.875	1	4.88	VH
Sacramento River	1	Adult Immigration and holding	0.1	Harvest/Angling Impacts	0.100	Ocean	0.700	0.700	6	4.20	VH

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Population	Pop Weight (0-1) Sum to 1	Life Stage	Life Stage Weight (0-1) Sum to 1	Primary Stressor Category	Primary Stressor Weight (0-1) Sum to 1	Specific Stressor	Specific Stressor Weight (0-1) Sum to 1	Composite Weight (X100)	Number of Specific Stressors	Normalized Weight (Composite * # of specific stressors)	Overall Stressor Category
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Flow Conditions	0.125	Flow Dependent Habitat Availability in the lower Sacramento River	0.200	0.813	5	4.06	VH
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Entrainment	0.075	Individual Diversions in the Delta	0.225	0.548	7	3.84	VH
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Entrainment	0.075	Jones and Banks Pumping Plants	0.225	0.548	7	3.84	VH
Sacramento River	1	Adult Immigration and holding	0.1	Passage Impediments/Barriers	0.425	Red Bluff Diversion Dam	0.150	0.638	6	3.83	VH
Sacramento River	1	Embryo Incubation	0.25	Harvest/Angling Impacts	0.150	Redd disturbance in upper Sacramento River	1.000	3.750	1.00	3.75	H
Sacramento River	1	Adult Immigration and holding	0.1	Flow Conditions	0.200	Low Flows - attraction, migratory cues AND Flood Flows - non-natal area attraction in Lower Sacramento River	0.600	1.200	3	3.60	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Floodplain Habitat	0.075	Loss of Floodplain Habitat in the Delta	0.350	0.853	4	3.41	H
Sacramento River	1	Spawning	0.325	Flow Conditions	0.100	Flow Fluctuations in upper Sacramento River	1.000	3.250	1	3.25	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Riparian Habitat and Instream Cover	0.125	Loss of Riparian Habitat and Instream Cover in the upper Sacramento River	0.200	0.813	4	3.25	H
Sacramento River	1	Spawning	0.325	Physical Habitat Alteration	0.100	Limited Instream Gravel Supply in upper Sacramento River	1.000	3.250	1	3.25	H
Sacramento River	1	Spawning	0.325	Short-term Inwater Construction	0.100	Sedimentation, turbidity, acoustic effects, hazardous spills in upper Sacramento River	1.000	3.250	1	3.25	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Natural Morphologic Function	0.150	Loss of Natural Morphologic Function in the middle Sacramento River	0.150	0.731	4	2.93	H
Sacramento River	1	Adult Immigration and holding	0.1	Short-term Inwater Construction	0.150	Sedimentation, turbidity, acoustic effects, hazardous spills in the upper Sacramento River	0.350	0.525	5	2.63	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Water Temperature	0.050	Middle Sacramento River	0.400	0.650	4	2.60	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Entrainment	0.075	Individual Diversions in the lower Sacramento River	0.150	0.366	7	2.56	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Entrainment	0.075	Individual Diversions in the middle Sacramento River	0.150	0.366	7	2.56	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Entrainment	0.075	Individual Diversions in the upper Sacramento River	0.150	0.366	7	2.56	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Flow Conditions	0.125	Flow Dependent Habitat Availability in the middle Sacramento River	0.125	0.508	5	2.54	H

Winter-run Chinook Salmon Stressor Matrix

Population	Pop Weight (0-1) Sum to 1	Life Stage	Life Stage Weight (0-1) Sum to 1	Primary Stressor Category	Primary Stressor Weight (0-1) Sum to 1	Specific Stressor	Specific Stressor Weight (0-1) Sum to 1	Composite Weight (X100)	Number of Specific Stressors	Normalized Weight (Composite * # of specific stressors)	Overall Stressor Category
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Flow Conditions	0.125	Flow Dependent Habitat Availability in the upper Sacramento River	0.125	0.508	5	2.54	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Predation	0.150	Predation in the Bay	0.100	0.488	5	2.44	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Floodplain Habitat	0.075	Loss of Floodplain Habitat in the middle Sacramento River	0.250	0.609	4	2.44	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Floodplain Habitat	0.075	Loss of Floodplain Habitat in the upper Sacramento River	0.250	0.609	4	2.44	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Short-term Inwater Construction	0.050	Sedimentation, turbidity, acoustic effects, hazardous spills in the Delta	0.300	0.488	5	2.44	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Short-term Inwater Construction	0.050	Sedimentation, turbidity, acoustic effects, hazardous spills in the lower Sacramento River	0.300	0.488	5	2.44	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Invasive species/Food Web Disruption	0.050	Asian clam, A. aspera, Microcystis, water hyacinth etc. in the Delta	0.700	1.138	2	2.28	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Tidal Marsh Habitat	0.050	Loss of Tidal Marsh Habitat in the Delta	0.600	0.975	2	1.95	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Water Temperature	0.050	Lower Sacramento River	0.300	0.488	4	1.95	H
Sacramento River	1	Spawning	0.325	Harvest/Angling Impacts	0.050	Upper Sacramento River	1.000	1.625	1	1.63	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Riparian Habitat and Instream Cover	0.125	Loss of Riparian Habitat and Instream Cover in the middle Sacramento River	0.100	0.406	4	1.63	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Short-term Inwater Construction	0.050	Sedimentation, turbidity, acoustic effects, hazardous spills in the Bays	0.200	0.325	5	1.63	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Water Quality	0.050	Ag, Urban in the lower Sacramento River	0.200	0.325	5	1.63	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Water Quality	0.050	Ag, Urban in the middle Sacramento River	0.200	0.325	5	1.63	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Water Quality	0.050	Ag, Urban, Heavy Metals in the Bays	0.200	0.325	5	1.63	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Water Quality	0.050	DO, Ag, Urban, Heavy Metals in th Delta	0.200	0.325	5	1.63	H
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Water Quality	0.050	Urban, Heavy Metals in the upper Sacramento River	0.200	0.325	5	1.63	H
Sacramento River	1	Adult Immigration and holding	0.1	Water Temperature	0.100	Upper Sacramento River	0.400	0.400	4	1.60	M
Sacramento River	1	Adult Immigration and holding	0.1	Short-term Inwater Construction	0.150	Sedimentation, turbidity, acoustic effects, hazardous spills in the Delta	0.200	0.300	5	1.50	M
Sacramento River	1	Adult Immigration and holding	0.1	Short-term Inwater Construction	0.150	Sedimentation, turbidity, acoustic effects, hazardous spills in the lower Sacramento River	0.200	0.300	5	1.50	M

Winter-run Chinook Salmon Stressor Matrix

Population	Pop Weight (0-1) Sum to 1	Life Stage	Life Stage Weight (0-1) Sum to 1	Primary Stressor Category	Primary Stressor Weight (0-1) Sum to 1	Specific Stressor	Specific Stressor Weight (0-1) Sum to 1	Composite Weight (X100)	Number of Specific Stressors	Normalized Weight (Composite * # of specific stressors)	Overall Stressor Category
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Floodplain Habitat	0.075	Loss of Floodplain Habitat in the lower Sacramento River	0.150	0.366	4	1.46	**M**
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Hatchery Effects	0.025	Competition, Predation in the upper Sacramento River	0.350	0.284	5	1.42	**M**
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Tidal Marsh Habitat	0.050	Loss of Tidal Marsh Habitat in the Bays	0.400	0.650	2	1.30	**M**
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Water Temperature	0.050	Delta	0.200	0.325	4	1.30	**M**
Sacramento River	1	Adult Immigration and holding	0.1	Passage Impediments/Barriers	0.425	Sacramento Deep Water Ship Channel	0.050	0.213	6	1.28	**M**
Sacramento River	1	Adult Immigration and holding	0.1	Passage Impediments/Barriers	0.425	Suisun Marsh Salinity Control Structure	0.050	0.213	6	1.28	**M**
Sacramento River	1	Adult Immigration and holding	0.1	Passage Impediments/Barriers	0.425	Sutter Bypass - Tisdale Weir	0.050	0.213	6	1.28	**M**
Sacramento River	1	Adult Immigration and holding	0.1	Passage Impediments/Barriers	0.425	Yolo Bypass-Freemont Weir	0.050	0.213	6	1.28	**M**
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Short-term Inwater Construction	0.050	Sedimentation, turbidity, acoustic effects, hazardous spills in the upper Sacramento River	0.150	0.244	5	1.22	**M**
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Upstream Passage Impediments/Barriers	0.025	Tributary Barriers	0.500	0.406	3	1.22	**M**
Sacramento River	1	Adult Immigration and holding	0.1	Flow Conditions	0.200	Low Flows - attraction, migratory cues in Middle Sacramento River	0.200	0.400	3	1.20	**M**
Sacramento River	1	Adult Immigration and holding	0.1	Flow Conditions	0.200	Low Flows - attraction, migratory cues in Upper Sacramento River	0.200	0.400	3	1.20	**M**
Sacramento River	1	Adult Immigration and holding	0.1	Harvest/Angling Impacts	0.100	Upper Sacramento River	0.200	0.200	6	1.20	**M**
Sacramento River	1	Adult Immigration and holding	0.1	Water Temperature	0.100	Middle Sacramento River	0.300	0.300	4	1.20	**M**
Sacramento River	1	Adult Immigration and holding	0.1	Short-term Inwater Construction	0.150	Sedimentation, turbidity, acoustic effects, hazardous spills in the Bays	0.150	0.225	5	1.13	**M**
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Flow Conditions	0.125	Reverse Flow Conditions in the Delta	0.050	0.203	5	1.02	**M**
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Hatchery Effects	0.025	Competition, Predation in the middle Sacramento River	0.250	0.203	5	1.02	**M**
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Upstream Passage Impediments/Barriers	0.025	Keswick Dam	0.400	0.325	3	0.98	**M**
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Invasive species/Food Web Disruption	0.050	Asian clam, A. aspera, Microcystis, water hyacinth etc. in the Bays	0.300	0.488	2	0.98	**M**
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Entrainment	0.075	Contra Costa Power Plant	0.050	0.122	7	0.85	**M**
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Entrainment	0.075	Pittsburg Power Plant	0.050	0.122	7	0.85	**M**

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Population	Pop Weight (0-1) Sum to 1	Life Stage	Life Stage Weight (0-1) Sum to 1	Primary Stressor Category	Primary Stressor Weight (0-1) Sum to 1	Specific Stressor	Specific Stressor Weight (0-1) Sum to 1	Composite Weight (X100)	Number of Specific Stressors	Normalized Weight (Composite * # of specific stressors)	Overall Stressor Category
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Hatchery Effects	0.025	Competition, Predation in the lower Sacramento River	0.200	0.163	5	0.81	**M**
Sacramento River	1	Adult Immigration and holding	0.1	Water Temperature	0.100	Lower Sacramento River	0.200	0.200	4	0.80	**L**
Sacramento River	1	Adult Immigration and holding	0.1	Short-term Inwater Construction	0.150	Sedimentation, turbidity, acoustic effects, hazardous spills in the middle Sacramento River	0.100	0.150	5	0.75	**L**
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Water Temperature	0.050	Upper Sacramento River	0.100	0.163	4	0.65	**L**
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Hatchery Effects	0.025	Competition, Predation in the Delta	0.150	0.122	5	0.61	**L**
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Short-term Inwater Construction	0.050	Sedimentation, turbidity, acoustic effects, hazardous spills in the middle Sacramento River	0.050	0.081	5	0.41	**L**
Sacramento River	1	Adult Immigration and holding	0.1	Water Quality	0.025	Urban, Heavy Metals in the upper Sacramento River	0.400	0.100	4	0.40	**L**
Sacramento River	1	Adult Immigration and holding	0.1	Water Temperature	0.100	Delta	0.100	0.100	4	0.40	**L**
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Upstream Passage Impediments/Barriers	0.025	ACID Dam	0.100	0.081	3	0.24	**L**
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Hatchery Effects	0.025	Competition, Predation in the Bays	0.050	0.041	5	0.20	**L**
Sacramento River	1	Adult Immigration and holding	0.1	Water Quality	0.025	Ag, Urban in the lower Sacramento River	0.200	0.050	4	0.20	**L**
Sacramento River	1	Adult Immigration and holding	0.1	Water Quality	0.025	Ag, Urban in the middle Sacramento River	0.200	0.050	4	0.20	**L**
Sacramento River	1	Adult Immigration and holding	0.1	Water Quality	0.025	DO, Ag, Urban, Heavy Metals in th Delta	0.200	0.050	4	0.20	**L**
Sacramento River	1	Adult Immigration and holding	0.1	Harvest/Angling Impacts	0.100	Bays	0.025	0.025	6	0.15	**L**
Sacramento River	1	Adult Immigration and holding	0.1	Harvest/Angling Impacts	0.100	Delta	0.025	0.025	6	0.15	**L**
Sacramento River	1	Adult Immigration and holding	0.1	Harvest/Angling Impacts	0.100	Lower Sacramento River	0.025	0.025	6	0.15	**L**
Sacramento River	1	Adult Immigration and holding	0.1	Harvest/Angling Impacts	0.100	Middle Sacramento River	0.025	0.025	6	0.15	**L**
Sacramento River	1	Adult Immigration and holding	0.1	Passage Impediments/Barriers	0.425	ACID Dam	0.000	0.000	6	0.00	**L**