

**Santa Ana River main stem, Orange and San Bernardino Counties
CAP Workbook Threats Assessment Summary Tables
2008**

Assessment of Target Viability
Santa Ana River main stem, Orange and San Bernardino Counties

Assessment of Target Viability													
Santa Ana River main stem, Orange and San Bernardino counties													
				Indicator Ratings									
				<i>Double-click opens entry form</i>									
				Bold = Current <i>Italics = Desired</i>									
Conservation Target	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	Current Indicator Status	Current Rating	Desired Rating	Date of Current Rating	Date for Desired Rating	
1	Egg	Landscape Context	Flow during incubation period	Baseflow in relation to avg. annual daily flow	< 25% of avg. annual daily flow	26-50% of avg. annual daily flow		> 50% of avg. annual daily flow	78% of main stem is perennially wet	Fair		Sep-07	
1	Egg	Landscape Context	Non-native species	Non-native egg predators	present throughout watershed	present in >50% of watershed	present in < 50% of watershed	absent				Oct-98	
1	Egg	Landscape Context	Water temperature	Mean weekly avg. temperature in redds	< 5 C. and > 13 C.	11.1-13 C.	10.1-11 C.	6-10 C.					
1	Egg	Condition	Substrate quality	Avg. percent fines (<0.85mm) in potential spawning areas	> 17% fines	11-17% fines	5-10 % fines	< 5% fines	no spawning habitat left in main stem; tributaries inaccessible	Poor		Sep-07	
1	Egg	Condition	Substrate quality	Embeddedness	> 75% embedded	50-75% embedded	25-49% embedded	< 25% embedded				May-95	
2	Fry	Landscape Context	Dispersal	Barriers between redds and rearing habitat	complete barrier	partial barriers common	partial barriers scarce	no barriers	78% of main stem is wetted	Fair		Sep-07	
2	Fry	Landscape Context	Non-native species	Non-native fry predators	present throughout watershed	present > 50% watershed	present < 50% of watershed	absent				Aug-07	
2	Fry	Landscape Context	Sediment supply	Turbidity (no. days turbidity is > 25 NTUs)	> 30 days during fry development period	20-30 days	10-19 days	< 10 days				Sep-07	
2	Fry	Condition	Habitat complexity/refugia	Amount of functional high velocity refuge habitat with flows < 15 cm/sec (boulders, overhanging banks, etc.)	none; watercourse in rearing habitat is channelized	some	common	abundant	78% of main stem is wetted	Fair		Jan-07	
3	Juvenile	Landscape Context	Dispersal	Barriers between rearing habitat and estuary	present			absent	main stem channelized; tributaries inaccessible	Poor		Sep-07	

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3	Juvenile	Landscape Context	Flow during rearing period	Pool habitat > 3 feet in depth	pools scarce or absent	low abundance of pools	high abundance of pools	high abundance of pools with multiple "refuge" pools (> 5 ft deep)	main stem completely channelized	Poor		Sep-07
3	Juvenile	Landscape Context	Non-native species	Non-native juvenile predators	present throughout watershed	present > 50% watershed	present < 50% watershed	absent				Oct-07
3	Juvenile	Landscape Context	Summer flow	Percent of unimpaired median summer baseflow (based on long-term mean monthly discharge)	< 70%	70-90%	> 90%	100% over all IP-km	summer flows depend on surface runoff from roads and amount of winter rainfall	Fair		Sep-07
3	Juvenile	Landscape Context	Water temperature	Median weekly average temperature (MWAT) in potential rearing habitat	> 21 C.	18-21 C.	< 18 C.	< 17 C.				May-95
3	Juvenile	Condition	Estuarine inflows	Percentage of unimpaired freshwater inflow to estuary (necessary for maintaining brackish water < 15 ppt salinity)	< 25%	25-49%	50-75%	> 75%				Sep-07
3	Juvenile	Condition	Estuarine inflows	Persistence of hypoxic or anoxic saline layer (> 15 ppt) in potential rearing habitat areas between May and onset of winter rains	3 months	1 month	1 week	< 3 days				Sep-96
3	Juvenile	Condition	Food availability	Species richness	< 25 taxa	25-29 taxa	30-40 taxa	> 40 taxa				Sep-07
3	Juvenile	Condition	Habitat complexity/refugia	Instream refugia	absent			present (boulders, overhanging banks, etc.)	78% of channel is wetted	Fair		Sep-07
3	Juvenile	Condition	Riparian corridor species composition and structure	Mean percent native, undisturbed composition and structure in 100-foot riparian buffer	< 25%	25-50%	51-75%	historic conditions				Sep-07
4	Smolt	Landscape Context	Dispersal	Number of days when depths are < 0.4 ft anywhere in migration corridor during outmigration period (March through June)	> 10 days	6-10 days	1-5 days	0 days	main stem is completely channelized; mostly dry in summer	Poor		Sep-07

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4	Smolt	Landscape Context	Flow for downstream passage March through June	Maximum potential rate of diversion by pumping during April and May (expressed as percent of estimate unimpaired median flow in April)	> 150%	100-150%	50-99%	< 50%				Sep-07	
4	Smolt	Landscape Context	Passage to ocean	Number of days stream mouth is open with adequate flow during outmigration period (March through June)	< 30 days	30-60 days	60-90 days	> 90 days				Sep-96	
5	Adult	Landscape Context	Dispersal	Accessibility of suitable spawning areas (based on TRT criteria)	accessible sites are clumped in one location or < 25% of all tributaries are accessible	25-50% of all tributaries are accessible	50-75% of all tributaries are accessible	> 75% of all tributaries are accessible	tributaries inaccessible; main stem channelized	Poor		Sep-07	
5	Adult	Landscape Context	Dispersal	Number of days stream mouth is open with adequate flow during entry period (1 November to 1 June)	< 30 days	30-60 days	60-90 days	> 90 days				Sep-96	
5	Adult	Landscape Context	Flow during spawning period (spawning and upstream/downstream passage)	Percent of net discharge (unimpaired flow minus total diversions) occurring between 1 December to 1 June, in all water years	> 10%	6-10%	3-5%	< 3%				Jun-02	
5	Adult	Landscape Context	Water temperature	Median weekly average temperature in migration corridor	> 17 C.	15-16.9 C.	13-14.9 C.	10-12.9 C.				May-96	
5	Adult	Size	Population size	Mean annual adult spawner abundance		TRT criteria for low extinction risk (by watershed)						May-07	
6	Multiple Life Stages	Landscape Context	Barriers/diversions	Stream crossings/stream mile	> two/mile			< two/mile	avg 1.55 crossings/mile	Fair		Jan-08	
6	Multiple Life Stages	Landscape Context	Channel flow and morphology	Percent of total watercourse length channelized	> 25%	16-25%	5-15%	< 5%	25%	Fair		Sep-07	
6	Multiple Life Stages	Landscape Context	Fire regime/vegetation maturity	Percent of watershed affected by high intensity fire within previous 100 yrs	> 25%	10-24%	5-9%	< 5%	26%	Poor		Jan-08	

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Conservation Target	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	Current Indicator Status	Current Rating	Desired Rating	Date of Current Rating	Date for Desired Rating
6	Multiple Life Stages	Landscape Context	Floodplain connectivity	Floodplain connectivity	< 50% of response reaches in watershed have inundation of historic floodplains by bankfull flows (connectivity)	50-65% of response reaches in watershed demonstrate floodplain connectivity	66-80% of response reaches in watershed demonstrate floodplain connectivity	> 80% of response reaches in watershed demonstrate connectivity	75%	Good		Sep-07
6	Multiple Life Stages	Landscape Context	Historic vs Current Spawning Habitat	Fraction of historic spawning tributaries currently accessible to spawners	< 15% available	16-50% available	51-90% available	>90% available	8%	Poor		Jan-08
6	Multiple Life Stages	Landscape Context	Hydrology	Dry stream reaches	> 75% dry reaches	26-75% dry reaches	1-25% dry reaches	no dry reaches; perennial surface flows	about 20% seasonal	Good		Sep-07
6	Multiple Life Stages	Landscape Context	Hydrology	Hydrograph	severely modified			natural	highly urbanized watershed; Prado Dam	Fair		Sep-07
6	Multiple Life Stages	Landscape Context	Land use	Distribution of public ownership along main stem of watercourse	< 25% of land bordering main stem of drainage is publicly owned	25-50%	51-75%	> 75%	29%	Fair		Jan-08
6	Multiple Life Stages	Landscape Context	Land use	Miles of road per square mile of watershed within 100 meters of watercourse	> 1 mi	0.5-1.0 mi	0.1-0.49 mi	< 0.1 mi	avg 0.70 mi/sq mile	Fair		Jan-08
6	Multiple Life Stages	Landscape Context	Land use	Miles of roads per square mile of watershed	> 3.0 mi	2.6-3.0 mi	1.6-2.5 mi	< 1.6 mi	avg 5.7 mi/sq mile	Poor		Jan-08
6	Multiple Life Stages	Landscape Context	Land use	Percent of watershed area in agricultural use	> 30%	20-29%	10-19%	< 10%	5.3% to 7.7%	Very Good		Jan-08
6	Multiple Life Stages	Landscape Context	Land use	Percent of watershed area in agriculture within 100 meters of watercourse	> 20%	11-20%	5-10%	< 5%	2.6%	Very Good		Jan-08
6	Multiple Life Stages	Landscape Context	Land use	Percent of watershed area in public ownership	< 25 % public ownership	25-50%	51-75%	> 75%	29%	Fair		Jan-08
6	Multiple Life Stages	Landscape Context	Land use	Percent of watershed area in urban/residential use	> 25%	10-25%	5-9%	< 5%	37%	Poor		Jan-08

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Conservation Target	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good	Current Indicator Status	Current Rating	Desired Rating	Date of Current Rating	Date for Desired Rating
6	Multiple Life Stages	Landscape Context	Water quality	General index of toxicity based on severity of adverse effects on fish	Acute lethal effects (fish kill)	Sublethal effects (reduced growth, altered behavior, etc.)	Toxins detected but no sublethal effects	No toxins or contaminants detected		Fair		Sep-07
6	Multiple Life Stages	Landscape Context	Water quality	Percent total impervious surfaces as % of watershed area	>40%	21-40%	5-20%	< 5%	11%	Fair		Jan-08
6	Multiple Life Stages	Condition	Estuarine habitat quality	Current lagoon area as percentage of historic total area	< 25%	26-50%	51-75%	> 75%	3%; lagoon highly modified	Poor		Jan-08
6	Multiple Life Stages	Condition	Estuarine habitat quality	Depth, LWD, and other habitat elements (e.g. eelgrass)	depth < 1 meter; LWD and/or overhanging banks absent		depth > 1 meter; LWD and/or overhanging banks present					Sep-96
6	Multiple Life Stages	Condition	Riparian corridor quality	Riparian canopy cover	< 25% cover	25-49% cover	50-75% cover	> 75% cover	51%	Good		Jan-08
6	Multiple Life Stages	Condition	Riparian corridor quality	Riparian corridor species composition	< 25% native composition	25-50% native composition	50-75% native composition	> 75% native composition				Sep-07

Overall Viability Summary
Santa Ana River main stem, Orange and San Bernardino counties

Summary of Threats Click the page-down icon ▼ to the right to view more summary tables.										
Santa Ana River main stem, Orange and San Bernardino counties										
Threats Across Targets		Egg	Fry	Juvenile	Smolt	Adult	Multiple Life Stages			Overall Threat Rank
		1	2	3	4	5	6	7	8	
1	Urban development	Very High			Very High					
2	Channel and/or estuary maintenance, dredging, and vegetation control (incl. flood control activities)	High	High	Very High	Very High	Very High	Very High			Very High
3	Dams and surface water diversions	High	High	Very High	Very High	Very High	Very High			Very High
4	Groundwater extraction	High	High	Very High	Very High	Very High	Very High			Very High
5	Levees and channelization	High	High	Very High	Very High	Very High	Very High			Very High
6	Culverts, crossings, and bridges	-	Medium	Very High	Very High	-	Very High			Very High
7	Conversion of watershed lands to row crop agriculture	Medium	-	-	-	-	Very High			High
8	Mining & Quarrying	-	-	-	-	-	Very High			High
9	Non-point pollution from roads	High	-	-	-	-	High			High
10	Agricultural effluents	-	-	-	-	-	Medium			Low
11	Artificial lagoon breaching	-	-	-	-	-	-			-
12	Gas, water, and/or other utility pipelines	-	-	-	-	-	-			-
13	Illegal collecting, poaching, and/or unauthorized angling	-	-	-	-	-	-			-
14	Invasive, non-native plants	-	-	-	-	-	-			-
15	Livestock Farming & Ranching	-	-	-	-	-	-			-
16	Non-native species present (incl. hatchery fish)	-	-	-	-	-	-			-
Threat Status for Targets and Project		Very High	-	-	Very High					

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Threats Across Targets		Egg	Fry	Juvenile	Smolt	Adult	Multiple Life Stages			Overall Threat Rank
		1	2	3	4	5	6	7	8	
Project-specific threats		1	2	3	4	5	6	7	8	
17	Oil & Gas Drilling	-	-	-	-	-	-			-
18	Public ownership in watershed									-
19	Recreational facilities and activities (ORV use, campgrounds, etc.)	-	-	-	-	-	-			-
20	Roads in watershed and/or within 300 feet of watercourses	-	-	-	-	-	-			-
21	Urban wastewater effluents (incl. industrial and commercial effluents)	-	-	-	-	-	-			-
22	Wildland fires (incl. debris flows following fires)	-	-	-	-	-	-			-
23										-
24										-
25										-
26										-
27										-
28										-
29										-
30										-
31										-
32										-
Threat Status for Targets and Project		Very High	-	-	Very High					

Overall Viability Summary
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Stresses (Altered Key Ecological Attributes) Across Targets		Egg	Fry	Juvenile	Smolt	Adult	Multiple Life Stages		
		1	2	3	4	5	6	7	8
1	Impaired riparian habitat quality	-	-	Very High	-	-	-	-	-
2	Impaired estuarine habitat quality	-	-	-	-	-	Very High	-	-
3	Altered land use from natural condition	-	-	-	-	-	Very High	-	-
4	Altered fire regime/recent fire in watershed	-	-	-	-	-	Very High	-	-
5	Impaired access to rearing and/or spawning habitat	-	-	-	-	-	Very High	-	-
6	Impaired access to spawning areas	-	-	-	-	Very High	-	-	-
7	Impaired access to ocean	-	-	-	Very High	-	-	-	-
8	Impaired access to estuary	-	-	Very High	-	-	-	-	-
9	Impaired water quality	-	-	-	-	-	High	-	-
10	Impaired habitat complexity/refugia	-	High	-	-	-	-	-	-
11	Altered sediment supply	-	High	-	-	-	-	-	-
12	Altered base flows during incubation	High	-	-	-	-	-	-	-
13	Altered hydrograph	-	-	-	-	-	High	-	-
14	Impaired substrate quality (sedimentation and embeddedness)	High	-	-	-	-	-	-	-
15	Impaired instream habitat complexity/refugia	-	-	High	-	-	-	-	-
16	Impaired flows during rearing period	-	-	Medium	-	-	-	-	-

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Stress Matrix									
Santa Ana River main stem, Orange and San Bernardino counties									
Stresses (Altered Key Ecological Attributes) Across Targets		Egg	Fry	Juvenile	Smolt	Adult	Multiple Life Stages		
		1	2	3	4	5	6	7	8
17	Altered riparian habitat quality	-	-	-	-	-	Medium	-	-
18	Impaired summer base flows	-	-	Medium	-	-	-	-	-
19	Impaired floodplain connectivity	-	-	-	-	-	Medium	-	-
20	Dispersal barriers between redds and rearing habitat	-	Medium	-	-	-	-	-	-
21	Impaired food availability	-	-	-	-	-	-	-	-
22	Low adult population size	-	-	-	-	-	-	-	-
23	Impaired estuarine inflows	-	-	-	-	-	-	-	-
24	Impaired water temperatures in migration corridor	-	-	-	-	-	-	-	-
25	Impaired water temperature in spawning areas	-	-	-	-	-	-	-	-
26	Impaired water temperature	-	-	-	-	-	-	-	-
27	Non-native egg predators	-	-	-	-	-	-	-	-
28	Impaired access to stream from ocean (stream mouth closed)	-	-	-	-	-	-	-	-
29	Non-native predators	-	-	-	-	-	-	-	-
30		-	-	-	-	-	-	-	-
31		-	-	-	-	-	-	-	-
32		-	-	-	-	-	-	-	-

Overall Viability Summary
Santa Ana River main stem, Orange and San Bernardino counties

Overall Viability Summary								
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Conservation Targets		Landscape Context		Condition		Size		Viability Rank
		Grade	Weight	Grade	Weight	Grade	Weight	
1	Egg	Fair	1	Poor	1	-	1	Fair
2	Fry	Fair	1	Fair	1	-	1	Fair
3	Juvenile	Poor	1	Fair	1	-	1	Fair
4	Smolt	Poor	1	-	1	-	1	Poor
5	Adult	Poor	1	-	1	-	1	Poor
6	Multiple Life Stages	Poor	1	Poor	1	-	1	Poor
7		-	1	-	1	-	1	-
8		-	1	-	1	-	1	-
Project Biodiversity Health Rank								Fair

Overall Viability Summary

Santa Ana River main stem, Orange and San Bernardino counties

Detailed Viability Summary

Santa Ana River main stem, Orange and San Bernardino counties

Conservation Targets		Key Ecological Attributes				Indicators				Calculated Rank	User Override
		Poor	Fair	Good	Very Good	Poor	Fair	Good	Very Good		
1	Egg									Fair	
	Landscape Context		1				1			Fair	
	Condition	1				1				Poor	
	Size									-	
2	Fry									Fair	
	Landscape Context		1				1			Fair	
	Condition		1				1			Fair	
	Size									-	
3	Juvenile									Fair	
	Landscape Context	2	1			2	1			Poor	
	Condition		1				1			Fair	
	Size									-	
4	Smolt									Poor	
	Landscape Context	1				1				Poor	
	Condition									-	
	Size									-	
5	Adult									Poor	
	Landscape Context	1				1				Poor	
	Condition									-	
	Size									-	
6	Multiple Life Stages									Poor	
	Landscape Context	2	4	2		4	8	2	2	Poor	
	Condition	1		1		1		1		Poor	
	Size									-	
7										-	
	Landscape Context									-	
	Condition									-	
	Size									-	
8										-	
	Landscape Context									-	
	Condition									-	
	Size									-	