

**Willow Creek, Monterey County
CAP Workbook Threats Assessment Summary Tables
2008**

Assessment of Target Viability

Double-click opens entry form				Indicator Ratings	Indicator Ratings		Indicator Ratings						
				Bold = Current	Indicator Ratings		<i>Italics = Desired</i>		Current Indicator Status	Current Rating	Desired Rating	Date of Current Rating	Date for Desired Rating
Conservation Target	Category	Key Attribute	Indicator	Poor	Fair	Good	Very Good						
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	probably very good	Very Good			Mar-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					Aug-07	
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.					Oct-05	
1 Egg	Condition	Substrate quality	Avg. percent fines (<0.85mm) in potential spawning areas	> 17% fines	11-17% fines	5-10 % fines	< 5% fines	probably low	Very Good			Mar-07	
1 Egg	Condition	Substrate quality	Embeddedness	> 75% embedded	50-75% embedded	25-49% embedded	< 25% embedded	probably low	Very Good			Mar-07	
2 Fry	Landscape Context	Dispersal	Barriers between redds and rearing habitat	complete barrier	partial barriers common	partial barriers scarce	no barriers	probably few to no barriers	Very Good			Mar-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					Jul-06	
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	instream refugia probably abundant	Very Good			Mar-07	
3 Juvenile	Landscape Context	Dispersal	Barriers between rearing habitat and estuary	present			absent	parking lot	Good			Mar-07	
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)	pool habitat probably abundant	Very Good			Mar-07	
3 Juvenile	Landscape Context	Non-native species	Non-native juvenile predators	present throughout watershed	present > 50% watershed	present < 50% watershed	absent					Aug-07	
3 Juvenile	Landscape Context	Summer flow	Percent of unimpaired median summer baseflow (based on long-term mean monthly discharge)	< 70% <i>s</i>	70-90%	> 90%	100% over all IP-km	perennial surface flows	Very Good			Mar-07	

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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
3	Juvenile	Landscape Context	Water temperature	Median weekly average temperature (MWAT) in potential rearing habitat	> 21 C.	18-21 C.	< 18 C.	< 17 C.				Oct-05	
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%	probably > 75%	Very Good		Jul-06	
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				Jul-06	
3	Juvenile	Condition	Food availability	Species richness	< 25 taxa	25-29 taxa	30-40 taxa	> 40 taxa				Mar-07	
3	Juvenile	Condition	Habitat complexity/refugia	Instream refugia	absent			present (boulders, overhanging banks, etc.)	probably abundant	Very Good		Mar-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				Jul-06	
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	perennial flows	Very Good		Mar-07	
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%	probably < 50%	Very Good		Mar-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	probably high	Very Good		Mar-07	
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	probably high accessibility	Very Good		Mar-07	

Assessment of Target Viability

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
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				Jul-06	
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%	probably < 3%	Very Good		Jul-06	
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.				Oct-05	
5	Adult	Size	Population size	Mean annual adult spawner abundance		TRT criteria for low extinction risk (by watershed)						Mar-03	
6	Multiple Life Stages	Landscape Context	Barriers/diversions	Stream crossings/stream mile	> two/mile			< two/mile	avg 0.21 crossings/mile	Very Good		Jan-08	
6	Multiple Life Stages	Landscape Context	Channel flow and morphology	Percent of total watercourse length channelized	> 25%	16-25%	5-15%	< 5%	< 5%	Very Good		Jan-08	
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%	56%	Poor		Jan-08	
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	> 80%	Very Good		Mar-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	probably near historic levels	Very Good		Mar-07	
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	perennial surface flows	Very Good		Mar-07	
6	Multiple Life Stages	Landscape Context	Hydrology	Hydrograph	severely modified			natural	probably near normal	Very Good		Mar-07	

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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	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%	96%	Very Good	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 0.31 mi/sq. mile	Good	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 1.30 mi/sq mile	Very Good	Jan-08	
6	Multiple Life Stages	Landscape Context	Land use	Percent of watershed area in agricultural use	> 30%	20-29%	10-19%	< 10%	0% to 0.1%	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%	0%	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%	95%	Very Good	Jan-08	
6	Multiple Life Stages	Landscape Context	Land use	Percent of watershed area in urban/residential use	> 25%	10-25%	5-9%	< 5%	0%	Very Good	Jan-08	
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	very low total N and P	Very Good	Jan-08	
6	Multiple Life Stages	Landscape Context	Water quality	Percent total impervious surfaces as % of watershed area	>40%	21-40%	5-20%	< 5%	0%	Very Good	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%	90%	Very Good	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				Mar-07	
6	Multiple Life Stages	Condition	Riparian corridor quality	Riparian canopy cover	< 25% cover	25-49% cover	50-75% cover	> 75% cover	94%	Very 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	pampas grass	Good	Mar-07	

Overall Viability Summary Willow Creek, Monterey County

Threats Across Targets		Egg	Fry	Juvenile	Smolt	Adult	Multiple Life Stages			Overall Threat Rank
		1	2	3	4	5	6	7	8	
1	Roads in watershed and/or within 300 feet of watercourses	Low	Low	Low	Low	Low	High			Medium
2	Recreational facilities and activities (ORV use, campgrounds, etc.)	Low	-	Medium	Low	Low	Medium			Medium
3	Groundwater extraction	Low	Low	Low	Low	Low	-			Low
4	Non-point pollution from roads	Low	Low	-	Low	Low	Low			Low
5	Culverts, crossings, and bridges	Low	Low	-	Low	Low	-			Low
6	Invasive non-native plants						Low			Low
7	Livestock Farming & Ranching	-	-	-	-	-	Low			Low
8	Natural barriers					Low	-			Low
9	Agricultural effluents	-	-	-	-	-	-			-
10	Artificial lagoon breaching	-	-	-	-	-	-			-
11	Channel and/or estuary maintenance, dredging, and vegetation control (incl. flood control activities)	-	-	-	-	-	-			-
12	Conversion of watershed lands to row crop agriculture	-	-	-	-	-	-			-
13	Dams and surface water diversions	-	-	-	-	-	-			-
14	Gas, water, and/or other utility pipelines	-	-	-	-	-	-			-
15	Illegal collecting, poaching, and/or unauthorized angling	-	-	-	-	-	-			-
16	Levees and channelization	-	-	-	-	-	-			-
Threat Status for Targets and Project		Low	Low	Low	Low	Low	Medium	-	-	Low

**Overall Viability Summary
Willow Creek, Monterey County**

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	Log jams and other removable barriers									-
18	Mining & Quarrying	-	-	-	-	-	-			-
19	Non-native species present (incl. hatchery fish)	-	-	-	-	-	-			-
20	Oil & Gas Drilling	-	-	-	-	-	-			-
21	Public ownership in watershed									-
22	Urban wastewater effluents (incl. industrial and commercial effluents)	-	-	-	-	-	-			-
23	Wildland fires (incl. debris flows following fires)	-	-	-	-	-	-			-
24										-

**Overall Viability Summary
Willow Creek, Monterey County**

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

**Overall Viability Summary
Willow Creek, Monterey County**

Stresses (Altered Key Ecological Attributes) Across Targets		Egg	Fry	Juvenile	Smolt	Adult	Multiple Life Stages		
		1	2	3	4	5	6	7	8
17	Impaired instream habitat complexity/refugia	-	-	Low	-	-	-	-	-
18	Impaired access to ocean	-	-	-	Low	-	-	-	-
19	Impaired access to stream from ocean (stream mouth closed)	-	-	-	-	Low	-	-	-
20	Impaired access to spawning areas	-	-	-	-	Low	-	-	-
21	Impaired riparian habitat quality	-	-	-	-	-	-	-	-
22	Low adult population size	-	-	-	-	-	-	-	-
23	Impaired water temperatures in migration corridor	-	-	-	-	-	-	-	-
24	Impaired food availability	-	-	-	-	-	-	-	-
25	Impaired water temperature	-	-	-	-	-	-	-	-
26	Non-native egg predators	-	-	-	-	-	-	-	-
27	Altered sediment supply	-	-	-	-	-	-	-	-
28	Non-native predators	-	-	-	-	-	-	-	-
29	Impaired water temperature in spawning areas	-	-	-	-	-	-	-	-
30		-	-	-	-	-	-	-	-

**Overall Viability Summary
Willow Creek, Monterey County**

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

Overall Viability Summary Willow Creek, Monterey County

Conservation Targets		Key Ecological Attributes				Indicators				Calculated Rank	User Override
		Poor	Fair	Good	Very Good	Poor	Fair	Good	Very Good		
1	Egg										Very Good
	Landscape Context				1				1	Very Good	
	Condition				1				2	Very Good	
	Size									-	
2	Fry										Very Good
	Landscape Context				1				1	Very Good	
	Condition				1				1	Very Good	
	Size									-	
3	Juvenile										Very Good
	Landscape Context			1	2			1	2	Very Good	
	Condition				2				2	Very Good	
	Size									-	
4	Smolt										Very Good
	Landscape Context				3				3	Very Good	
	Condition									-	
	Size									-	
5	Adult										Very Good
	Landscape Context				2				2	Very Good	
	Condition									-	
	Size									-	
6	Multiple Life Stages										Fair
	Landscape Context	1			7	1		1	14	Poor	
	Condition				2			1	2	Very Good	
	Size									-	
7											-
	Landscape Context									-	
	Condition									-	
	Size									-	
8											-
	Landscape Context									-	
	Condition									-	
	Size									-	