USAL CREEK

Usal Creek

Dependent Population
10.6 Km of Potential Habitat
Coho salmon and steelhead present

Usal Creek drains an area of approximately 28 square miles of western Mendocino County, and enters directly to the Pacific Ocean about 30 miles north of the town of Fort Bragg. About 70 percent of the Usal Creek watershed is redwood coniferous forest and about 20 percent of the watershed area is either montane or riparian hardwood forest. The entire Usal Creek watershed has been characterized as being highly erodible after considering slope, precipitation, and the susceptibility of failure of underlying geology. The watershed consists of 98 percent private lands, with about two percent of the watershed is in public parks and recreation lands. The dominant land use within the Usal Creek watershed is forestry. Within the past ten years, about ten percent of the Usal Creek watershed has been under a timber harvest plan. Housing development within the watershed is rare – only two houses are present.

Usal Creek
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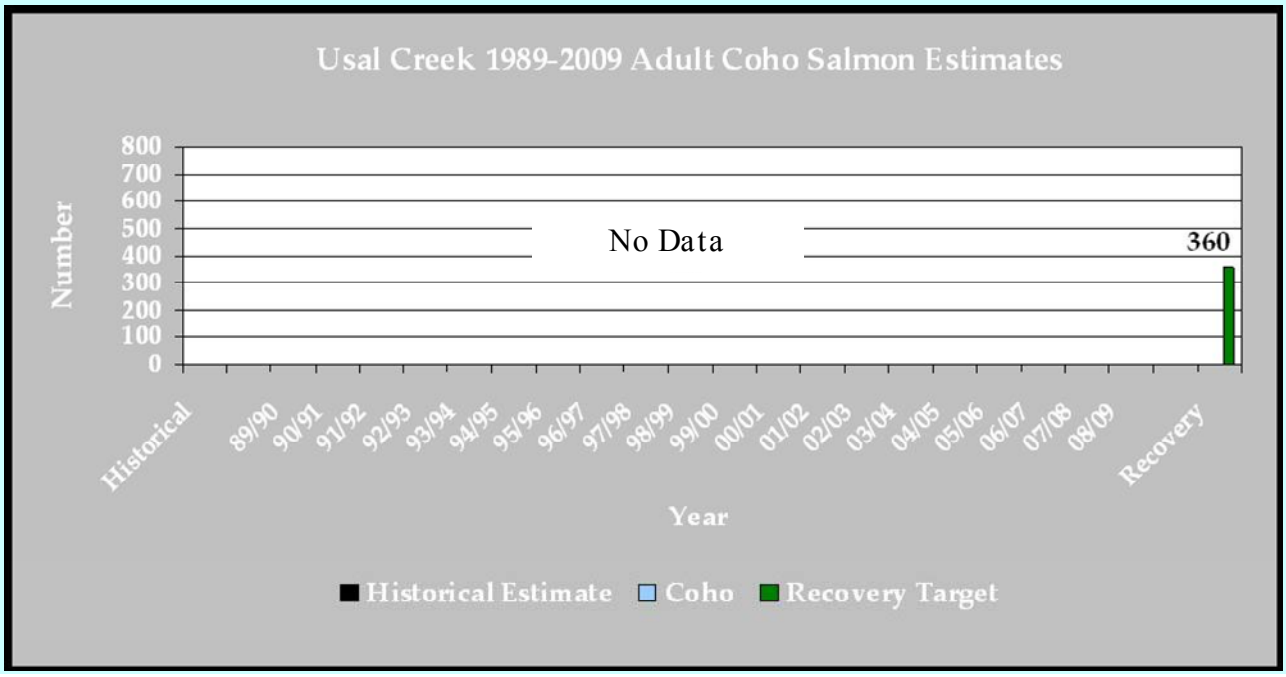
The Watershed at a Glance

Spawning Quantity & Quality:	**GOOD to VERY GOOD**
Summer Water Temperatures:	**GOOD**
Depth & Shelter of Pools	**FAIR**
Large Wood Frequency:	**FAIR**
Riparian Canopy:	**GOOD to VERY GOOD**
off channel/Floodplain Quality:	**FAIR**
Estuary Function:	**POOR**



Usal Creek

Recovery Target: 360 Adult Coho Salmon

Increasing the survival of coho salmon

requires **protecting** all individuals from threats that are jeopardizing coho salmon. The highest ranked threats are:

- Roads and Railroads

Preventing the extinction of coho salmon

means **restoring** many key habitat attributes within the Usal Creek watershed that are in poor condition. The highest priorities for restoration are to:

- Improve pool complexity
- Reduces sources of sediment
- Reduce the amount of roads throughout watershed
- Reduce the amount of roads in riparian areas
- Improve estuary condition

Advancing recovery of coho

salmon in Usal Creek requires these priority **recovery actions:**

- Install large wood, boulders, and other structures to increase stream complexity and improve pool frequency and depth.
- Promote restoration projects designed to create or restore alcove, backchannel, ephemeral tributary, or seasonal pond habitats.
- Decommission riparian road systems and/or upgrade roads and skid trails that deliver sediment to streams.
- Provide for watershed processes by promoting long term sustainable forestry practices that support coho salmon
- Build no more roads within floodplains, riparian areas, areas with unstable soils or other sensitive characteristics until a watershed or specific road management plan is created and implemented.

. . . **throughout** the Usal Creek watershed.

Series of photos documenting landslide on Soldier Creek (upper left and right) **and turbidity plume downstream to confluence with Usal Creek** (lower right) **and continuing downstream on Usal Creek** (lower left)**.**
Photo provided by the National Marine Fisheries Service and is used with permission.

Conservation Highlights

- To improve aquatic habitat Campbell Timberland Management and Redwood Forest Foundation have collaborated on sediment remediation projects.

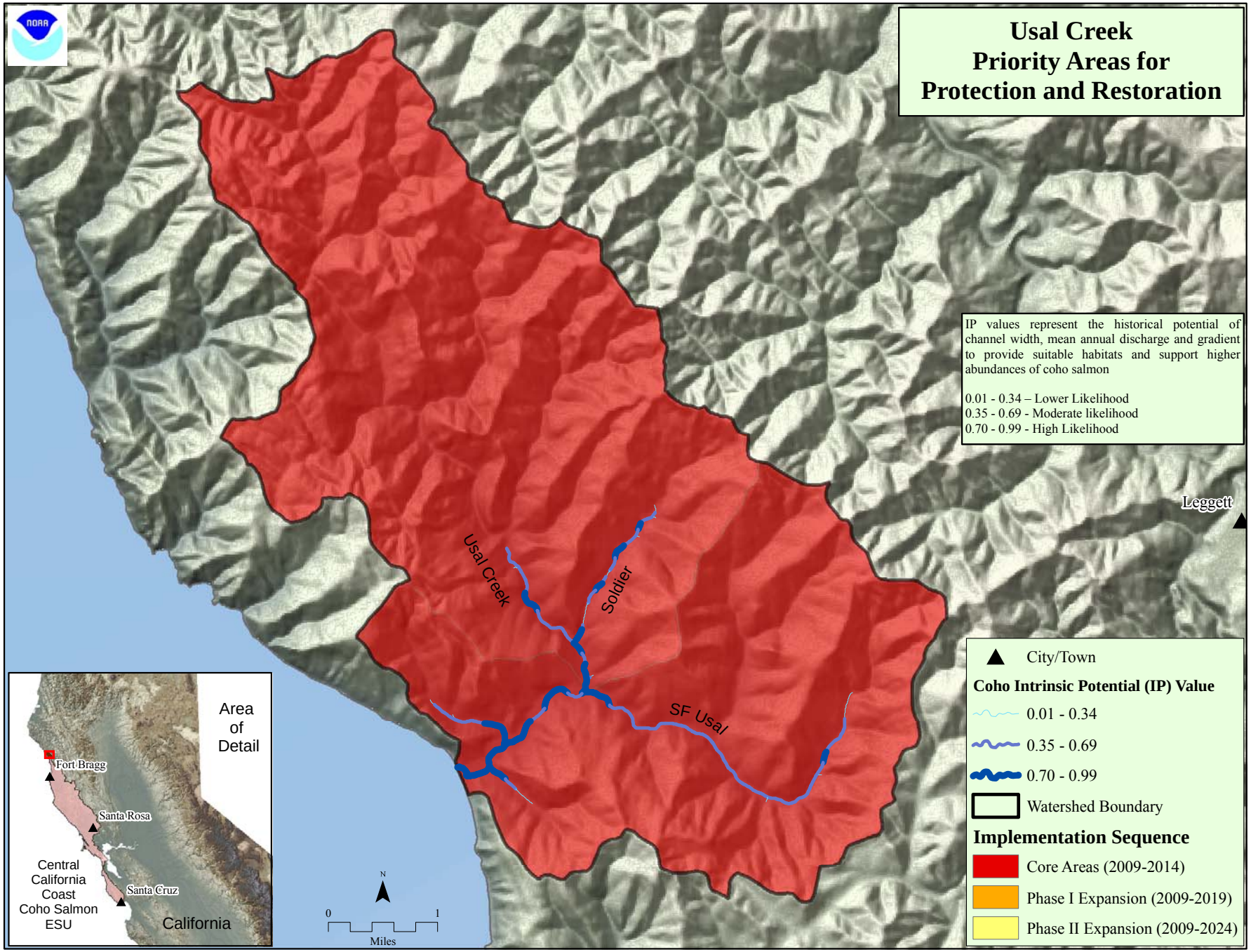
Usal Creek (left) Soldier Creek confluence. This is the same location, 12 years later, as the lower right photo of the previous figure.
Photo provided by Redwood Forest Foundation, Inc., and is used with permission. All rights reserved.

Immediate Needs

√ Place instream structures to improve habitat
√ Road sediment remediation

Recovery Partners

DFG
Campbell Timberland Management
Redwood Forest Foundation, Inc.
California State Parks
Trout Unlimited


Usal Creek
Priority Areas for
Protection and Restoration
IP values represent the historical potential of channel width, mean annual discharge and gradient to provide suitable habitats and support higher abundances of coho salmon
0.01 - 0.34 – Lower Likelihood
0.35 - 0.69 - Moderate likelihood
0.70 - 0.99 - High Likelihood
Leggett
Usal Creek
Soldier
SF Usal
City/Town
Coho Intrinsic Potential (IP) Value
0.01 - 0.34
0.35 - 0.69
0.70 - 0.99
Watershed Boundary
Implementation Sequence
Core Areas (2009-2014)
Phase I Expansion (2009-2019)
Phase II Expansion (2009-2024)
Area of Detail
Fort Bragg
Santa Rosa
Santa Cruz
Central California Coast Coho Salmon ESU
California
N
0
1
Miles

CCC Coho Salmon
Usal Creek
CAP Viability Table Results

Analyst	Source	Result	Rating	Target	Habitat Attribute	Indicator	Poor	Fair	Good	Very Good
Flow Panel	Decision Matrix	NA	NA	Spawning Adults	Hydrology	Passage Flows	>75 (score)	51-75	35-50	<35
SEC	PSMFC Database	100%	Very Good	Spawning Adults	Passage	Physical Barriers	<50% of IP-km	50-70% of IP-km	70-90% of IP-km	>90% of IP-km
NCWAP	Decision Matrix	60-90 days	Good	Spawning Adults	Passage	Passage at Mouth	<30 days	30-60 days	60-90 days	>90 days
SEC	CDFG HAB 8	NA	NA	Spawning Adults	Sediment	Amount of Gravel*	<100m2	100-500m2	500-1,000m2	>1,000
NMFS	Best Prof. judgment	<5%	Good	Spawning Adults	Viability	Freshwater Harvest	>10% of pop.	5-10%	<5%	
Flow Panel	Decision Matrix	NA	NA	Eggs	Hydrology	Instantaneous Condition	>75 (score)	51-75	35-50	<35
Flow Panel	Decision Matrix	NA	NA	Eggs	Hydrology	Redd Scour	>75 (score)	51-75	35-50	<35
SEC	Many Sources	NA	NA	Eggs	Sediment	Gravel Quality	>17% 0.85mm and or >30% 6.3mm	15-17% 0.85	12-14% 0.85mm and or <30% 6.3mm	<12% 0.85
SEC	CDFG HAB 8	91%	Good	Eggs	Sediment	Gravel Quality (Embeddedness)	<25% of scores 1s&2s	25-50% of scores 1s&2s	>50% of scores 1s&2s	
Flow Panel	Decision Matrix	NA	NA	Summer Rearing	Hydrology	Baseflow	>75 (score)	51-75	35-50	<35
SEC	CDFG HAB 8	NA	NA	Summer Rearing	Pool Habitat	Shelter Rating	<60 avg. rating	60-80	80-100	>100
SEC	CDFG HAB 8	NA	NA	Summer Rearing	Pool Habitat	Primary Pools	<30% pools by length	30-40%	40-50%	>50%
SEC/NMFS	Many Sources	NA	NA	Summer Rearing	Water Quality	Temperature	>30% of IP > 17 C MWMT	Does not meet Good or Very Good	30-60% of IP < 15C MWMT	>60% of IP < 15C MWMT
SEC	CDFG HAB 8	Poor	Poor	Winter Rearing	Floodplain	Complex Habitat**	<50% Connected	50-80% connected	>80% connected	
NMFS	NCWAP	Fair	Fair	Smolts	Estuary	Estuary				
Flow Panel	Decision Matrix	NA	NA	Smolts	Hydrology	Passage Flows	>75 (score)	51-75	35-50	<35
SEC	SWRCB	0/10 IP-km	Very Good	Smolts	Passage	# of Diversions**	>5 / 10 IP km	1.1-5	0.01-1	0
SEC	CDFG HAB 8	NA	NA	Multiple Life Stages	Pool Habitat	Shelter Rating	<60 avg. rating	60-80	80-100	>100
NMFS	Best Prof. judgment	Good	Good	Multiple Life Stages	Floodplain	Floodplain Connectivity	<50%	50-80%	>80%	not defined
NMFS	CDF CWHR	NA	Good	Multiple Life Stages	Hydrology	Stand Age			>40 years old	
SEC	NLCDB	0.12%	Very Good	Multiple Life Stages	Hydrology	Impervious Surfaces	>12.01% of WS by area	7.01-12%	3.01-7%	0-3%
SEC	FMMP	0.00%	Very Good	Multiple Life Stages	Land disturbance	Agriculture	>30% of WS by area	10-30%	0.1-10%	<0.1%
NMFS	CDF THP Dataset	10%	Good	Multiple Life Stages	Land disturbance	Timber Harvest	>35% of WS by area	25 - 35%	10 - 25%	<10%
SEC	Best Prof. judgment	NA	Poor	Multiple Life Stages	Pool Habitat	LWD Freq. (BFW 0-10)	<4key pcs/100m	4-6/100m	6-11/100m	>11/100m
SEC	Best Prof. judgment	NA	Poor	Multiple Life Stages	Pool Habitat	LWD Freq. (BFW 10-100)	<1/100m	1-1.3/100m	1.3-4/100m	>4/100m
NMFS	CDF CWHR	<25%	Poor	Multiple Life Stages	Riparian Veg.	Species Composition	<25%	25-50%	>50%	Historical Conditions
NMFS	CDF CWHR	55-69%	Good	Multiple Life Stages	Riparian Veg.	DBH	<39% Class 5 and 6	40-54%	55-69%	>69%
SEC	CDFG HAB 8	75-85%	Fair	Multiple Life Stages	Riparian Veg.	Canopy Cover	<45 % avg. over IP-km	75-85%	85-95%	>95%
NMFS	CDF THP Dataset	3.5 mi/sq.mi.	Poor	Multiple Life Stages	Sediment Transport	Road Density	>3 miles/sq. mile	3 to 2.5	2.5 to 1.6	<1.6
NMFS	CDF THP Dataset	4.3 mi/sq.mi.	Poor	Multiple Life Stages	Sediment Transport	Road density 100	>1 miles/sq. mile	1-0.5	0.5-0.1	<0.1
NMFS	Many Sources	Good	Good	Multiple Life Stages	Water Quality	Toxicity	Acute	Sublethal or Chronic	No Acute or Chronic	No evidence of toxins or Contaminants
NMFS	Best Prof. judgment	<1 per IP-km	Poor	Spawning Adults	Viability	Adult Density	<1 per IP-km	1-20 per IP-km	20-40 per IP-km	>40 per IP-km
NMFS	Best Prof. judgment	< 0.2 fish/m^2	Poor	Summer Rearing	Viability	Juvenile Density	< 0.2 fish/m^2	0.2-0.5 fish/m^2	0.5-1.0 fish/m^2	>1.0 fish/m^2
NMFS	Best Prof. judgment	<20% IP-km occupied	Poor	Summer Rearing	Viability	Juvenile Distribution	<20% IP-km occupied	20-34%	35-50%	>50%

See Appendix C for a full description of the analysis methods for the Viability Table Reports

* = watershed specific numbers

** = Ratings defined by the distribution of results

Usal Creek Threats Across Targets		Spawning Adults	Eggs	Summer Rearing Juveniles	Winter Rearing Juveniles	Smolts	Multiple Life Stages	Overall Threat Rank
Project-specific threats		1	2	3	4	5	6	
1	Roads and Railroads	Medium	Medium	High	Medium	Medium	High	High
2	Droughts	Medium	Low	High	Medium	High	Low	High
3	Fire and Fuel Management	Medium	Low	Medium	Medium	Medium	High	Medium
4	Logging and Wood Harvesting	Medium	Low	Medium	Medium	Medium	High	Medium
5	Fishing and Collecting	High	-	Medium	-	Medium	-	Medium
6	Disease, Predation, and Competition	-	-	Medium	-	High	-	Medium
7	Channel Modification	Medium	Low	Medium	Medium	Medium	Medium	Medium
8	Climate Change	Medium	Low	Medium	Medium	Medium	Medium	Medium
9	Mining	Medium	Low	Medium	Medium	Medium	Medium	Medium
10	Recreational Areas and Activities	Medium	Low	Medium	Medium	Medium	Medium	Medium
11	Storms and Flooding	Low	Low	Medium	Medium	Medium	Medium	Medium
12	Residential and Commercial Development	-	Low	Low	Low	Medium	Medium	Medium
13	Water Diversion and Impoundment	Low	Low	Medium	Low	Medium	-	Medium
14	Agricultural Practices	-	Low	Low	-	-	Medium	Low
15	Hatcheries and Aquaculture	Low	-	-	-	-	-	Low
16	Livestock Farming and Ranching	Low	-	-	-	-	-	Low
Threat Status for Targets and Project		High	Medium	High	Medium	High	High	High

Usal Creek (Lost Coast-Navarro Point) Threats and Associated Recovery Actions

Recovery Strategy Number	Level	Targeted Attribute or Threat	Action Description	Priority Number	Action Duration (Years)	Recovery Partners	Costs ($K)						Comments
							FY1	FY2	FY3	FY4	FY5	Entire Duration	
UsC-A-1.1	Objective	Estuary	Restore and enhance estuary habitat in the watershed.										
UsC-A-1.1.1	Recovery Action	Estuary	Evaluate all potential solutions to restore Usal estuary to improve rearing and migration conditions for salmonids.										
UsC-A-1.1.1.1	Action Step	Estuary	Implement Large Woody Debris loading project, proposed by Campbell Timberland Management and NMFS HCD, to scour channel and mobilize aggraded stream bed in upper estuarine reach.	2	2	Campbell Timberland Management, Mendocino County, Redwood Forest Foundation, State Parks	50.00	50.00				100	The upper estuary and mainstem Usal is potentially high value juvenile rearing habitat. Under current conditions, the upper estuary and mainstem Usal go dry. The likely cause of this is sediment aggradation from upslope sources. The purpose of this action is to reestablish channel thalwag and channel meander (using existing channel forming features as reference points). Bio-engineered willow baffles could help form riparian floodplain terraces and maintain the reestablished channel width to depth ratio.
UsC-A-1.1.1.2	Action Step	Estuary	Conduct conifer release by thinning hardwoods in lower reaches of South and North Fork Usal Creek. Conifers could serve as a source for future large woody debris recruitment into the estuary and aid in cooler water temperatures flowing into estuary.	2	2	Campbell Timberland Management, Redwood Forest Foundation	15.00	15.00				30	Cost would be almost completely for personnel. Little permitting costs anticipated.
UsC-A-1.1.1.3	Action Step	Estuary	Initiate riparian planting of conifers within the riparian zones that are currently dominated by hardwoods.	2	5	Campbell Timberland Management, CDFG, State Parks	8.00	8.00	8.00	8.00	8.00	40	Initial efforts should focus on the alder dominated riparian areas along the mainstem and lower North and South Forks of Usal Creek.
UsC-A-2.1	Objective	Floodplain	Improve over-winter survival by increasing the frequency and functionality of off-channel habitats.										
UsC-A-2.1.1	Recovery Action	Floodplain	Create flood refuge habitat, such as hydrologically connected floodplains with riparian forest.										
UsC-A-2.1.1.1	Action Step	Floodplain	Delineate reaches possessing both potential winter rearing habitat and floodplain areas.	2	2	Campbell Timberland Management, CDFG, Redwood Forest Foundation, State Parks	10.00	10.00				20	Assessments have already been conducted but additional site specific field checks and mapping are likely needed.
UsC-A-2.1.1.2	Action Step	Floodplain	Target habitat restoration and enhancement that will function between winter base flow and flood stage.	3	20	Campbell Timberland Management, CDFG, NOAA RC, Redwood Forest Foundation, State Parks						TBD	Difficult to estimate cost until an evaluation of habitat enhancement opportunities are conducted.
UsC-A-2.1.1.3	Action Step	Floodplain	Promote restoration projects designed to create or restore alcove, backchannel, ephemeral tributary, or seasonal pond habitats.	1	20	Campbell Timberland Management, CDFG, NOAA RC, Redwood Forest Foundation, RWQCB, State Parks, USACE						TBD	Cost cannot be determined due to the unknown quantity of opportunities to enhancement existing habitat conditions. Areas with perennial flow and high IP-km scores should be targeted first for this measure.
UsC-A-2.1.1.4	Action Step	Floodplain	Conduct collaborative evaluations of priorities for treatment of CCC coho salmon passage barriers, such as the Fish Passage Forum (DFG 2004). Smolt outmigration constraints should also be evaluated, particularly during drought years through the aggraded estuary and lower reaches of N Fk Usal.	2	10	Campbell Timberland Management, CDFG, Redwood Forest Foundation						TBD	
UsC-A-6.1	Objective	Pool Habitat	Improve summer rearing, winter rearing, and smolt survival by increasing instream channel complexity in potential rearing and migration reaches. Additionally, improve egg survival by reducing redd scour in streams characterized by high bedload mobility.										
UsC-A-6.1.1	Recovery Action	Pool Habitat	Encourage retention and recruitment of large woody debris for all historic CCC coho salmon streams.										

Usal Creek (Lost Coast-Navarro Point) Threats and Associated Recovery Actions

Recovery Strategy Number	Level	Targeted Attribute or Threat	Action Description	Priority Number	Action Duration (Years)	Recovery Partners	Costs ($K)						Comments
							FY1	FY2	FY3	FY4	FY5	Entire Duration	
UsC-A-6.1.1.1	Action Step	Pool Habitat	Maintain current LWD, boulders, and other structure-providing features to maintain current stream complexity, pool frequency, and depth (DFG 2004).	1	60	Campbell Timberland Management, Redwood Forest Foundation, State Parks						0	Keeping instream structure will result in no increased costs.
UsC-A-6.1.2	Recovery Action	Pool Habitat	Identify historic CCC coho salmon habitats lacking in channel complexity, and promote restoration projects designed to create or restore complex habitat features that provide for localized pool scour, velocity refuge, and cover.										
UsC-A-6.1.2.1	Action Step	Pool Habitat	Install LWD, boulders, and other instream features to increase habitat complexity and improve pool frequency and depth (DFG 2004).	1	5	Campbell Timberland Management, CDFG, NOAA RC, Redwood Forest Foundation, RWQCB, State Parks	40.00	40.00	40.00	40.00	40.00	200	Costs should reflect a relative savings due to the fact that the watershed has been habitat typed and key areas of coho refuge have been identified. Most materials for instream habitat improvement are available on site and therefore material costs should be minimal . It is assumed, due to the lack of infrastructure that the majority of instream structures will consist of trees felled directly into the creek and left unsecured. Large wood enhancement should occur in the lower portions of South Fork and North Fork Usal first, and work upstream. Improving habitat conditions in the upper reach of the heavily aggraded mainstem is likely the highest restoration priority in the entire watershed. If positive channel response is observed, additional loading should occur in the currently aggraded mainstem.
UsC-A-6.1.3	Recovery Action	Pool Habitat	Encourage landowners to implement restoration projects as part of their ongoing operations in stream reaches where large woody debris is lacking.	1	60	CalFire, Campbell Timberland Management, CDFG, Mendocino County, State Parks						0	Cost should be minimal if actions occur as part of ongoing timber harvest operations. This assumes DFG, NMFS, CalFire, and RWQCB are able to streamline the permitting process.
UsC-A-8.1	Objective	Sediment	Improve habitat conditions at multiple life stages by reducing sediment inputs to the stream at the watershed scale.										
UsC-A-8.1.1	Recovery Action	Sediment	Address sources from road networks, trails, and other actions.										
UsC-A-8.1.1.1	Action Step	Sediment	Provide incentives to restore high priority sites as determined by watershed analysis, DFG, or CalFire.	3	60	California Coastal Conservancy, CDFG, FEMA, NOAA RC, State Parks						TBD	
UsC-A-8.1.1.2	Action Step	Sediment	Roads or landings shall be maintained at the design standards that lower risk of mass wasting sediment delivery.	2	60	CalFire, Mendocino County Department of Public Works, Redwood Forest Foundation, State Parks						TBD	This cost should be incorporated into ongoing road maintenance duties and responsibilities.
UsC-A-8.1.2	Recovery Action	Sediment	Conduct road and sediment reduction assessments to identify sediment-related and runoff-related problems and determine level of hydrologic connectivity.										
UsC-A-8.1.2.1	Action Step	Sediment	Assess effectiveness of erosion control measures throughout the winter period.	2	60	CalFire, Campbell Timberland Management, Mendocino County Department of Public Works, Redwood Forest Foundation, State Parks						TBD	Costs should be incorporated into ongoing road management operations.

Usal Creek (Lost Coast-Navarro Point) Threats and Associated Recovery Actions

Recovery Strategy Number	Level	Targeted Attribute or Threat	Action Description	Priority Number	Action Duration (Years)	Recovery Partners	Costs ($K)						Comments
							FY1	FY2	FY3	FY4	FY5	Entire Duration	
UsC-A-8.1.3	Recovery Action	Sediment	Reduce the number of road crossings across watercourses. Prioritize installation of appropriately sized bridges on N.F. Usal Riparian Road.	3	30	CalFire, Campbell Timberland Management, CDFG, Redwood Forest Foundation, State Parks						TBD	Costs are unknown until a road assessment is conducted and feasibility determined.
UsC-A-8.1.4	Recovery Action	Sediment	Close unauthorized trails and conduct appropriate decommissioning practices. Hydrologically disconnect trails from associated waterways. Focus initial efforts in areas draining directly to areas with extant coho salmon populations.	3	20	CalFire, California Department of Mines and Geology, Campbell Timberland Management, NOAA RC, Redwood Forest Foundation, State Parks						TBD	Cost cannot be determined until a road and trail assessment is conducted.
UsC-A-9.1	Objective	Viability	Develop and implement a monitoring program to evaluate the performance of recovery efforts.										
UsC-A-9.1.1	Recovery Action	Viability	Measure or estimate response of key habitat attributes to recovery efforts across the watershed.	3	60	Campbell Timberland Management, CDFG, NOAA RC, Redwood Forest Foundation, State Parks						TBD	The Redwood Forest Foundation lacks staff to do this type of work and would likely rely almost totally on outside funding sources to implement this recommendation.
UsC-A-9.1.2	Recovery Action	Viability	Monitor population status for response to recovery actions.										
UsC-A-9.1.2.1	Action Step	Viability	Continue and improve upon monitoring activities to determine the population status of adult and smolt salmonids in the watershed.	3	20	CDFG, NOAA RC, Redwood Forest Foundation						TBD	This recommendation has a lower priority due to the Dependent status of the watershed and the amount of ongoing monitoring in the Lost Coast Diversity Stratum. Redd counts may cost approximately 35,000 dollars per year if implemented.
UsC-A-24.1	Objective	Roads and Railroads	Reduce road densities by 10 percent over the next 10 years, prioritizing high risk areas in historical habitats or Core CCC coho salmon watersheds.										
UsC-A-24.1.1	Recovery Action	Roads and Railroads	Assess and redesign transportation network to minimize road density and maximize transportation efficiency.	2	30	CalFire, Mendocino County Department of Public Works, Redwood Forest Foundation, State Parks						TBD	Cost likely to be significant. However, the cost is difficult to determine pending a road assessment and prioritization. Some upgrades have already occurred.
UsC-A-24.1.2	Recovery Action	Roads and Railroads	Decommission riparian road systems and/or upgrade roads (and skid trails on forestlands) that deliver sediment into adjacent watercourses (DFG 2004).	1	30	CalFire, California Department of Mines and Geology, Mendocino County Department of Public Works, Redwood Forest Foundation, RWQCB						TBD	This action should be implemented in the near future. However, a longer duration is associated with the action due to the long amount of time anticipated to fully implement this recommendation. North Fork Usal's mainline riparian road should be considered one of the top priorities for decommissioning.
UsC-A-24.2	Objective	Roads and Railroads	Conduct actions that hydrologically disconnect roads in Core areas within ten years (from 2010).										
UsC-A-24.2.1	Recovery Action	Roads and Railroads	Address sediment and runoff sources from road networks and other actions that deliver sediment and runoff to stream channels.										

Usal Creek (Lost Coast-Navarro Point) Threats and Associated Recovery Actions

Recovery Strategy Number	Level	Targeted Attribute or Threat	Action Description	Priority Number	Action Duration (Years)	Recovery Partners	Costs ($K)						Comments
							FY1	FY2	FY3	FY4	FY5	Entire Duration	
UsC-A-24.2.1.1	Action Step	Roads and Railroads	Licensed engineering geologists should review and approve grading on inner gorge slopes.	2	60	CalFire, California Department of Mines and Geology, Campbell Timberland Management, Redwood Forest Foundation, State Parks						TBD	Costs will depend on the frequency of the action which cannot be determined at this time.
UsC-A-24.2.1.2	Action Step	Roads and Railroads	Establish adequate spoils storage sites throughout the watershed so that material from landslides and road maintenance can be stored safely away from coho streams. Coordinate these efforts with all landowners in the watershed, CalTrans, and county road maintenance staff as appropriate.	3	60	CalFire, Campbell Timberland Management, Redwood Forest Foundation						0	These areas have likely been identified in the Usal watershed.
UsC-A-24.2.1.3	Action Step	Roads and Railroads	Encourage County of Mendocino to address sediment input from the Usal County road into Waterfall Gulch (tributary to North Fork Usal).	1	5	CDFG, Mendocino County Department of Public Works, RWQCB						TBD	The Usal County Road should be properly winterized to ensure sediment from this dirt road does not continue to enter Usal Creek.
UsC-A-24.2.2	Recovery Action	Roads and Railroads	Limit winter use of unsurfaced roads and recreational trails by unauthorized individuals and impacting uses to decrease fine sediment loads.										
UsC-A-24.2.2.1	Action Step	Roads and Railroads	Conduct annual inspections of all roads prior to winter. Correct conditions that are likely to deliver sediment to streams. Hydrologically disconnect roads.	2	60	CalFire, Campbell Timberland Management, Mendocino County Department of Public Works, Redwood Forest Foundation, State Parks						TBD	Cost should be considered part of ongoing road maintenance.
UsC-A-24.2.3	Recovery Action	Roads and Railroads	Bridges associated with new roads or replacement bridges (including railroad bridges) should be free span or constructed with the minimum number of bents feasible in order to minimize drift accumulation and facilitate fish passage.	2	60	CalFire, Mendocino County Department of Public Works, Redwood Forest Foundation, State Parks						TBD	This is likely already considered a standard practices by land managers in the watershed. Particular focus is necessary for the Usal County Road bridge over Usal Creek, which is vulnerable to drift accumulation.
UsC-A-24.2.3.1	Action Step	Roads and Railroads	Stream crossings on THP parcels should be identified and mapped with the intention of replacement or removal if they cannot pass 100 year flow. Design should include fail safe measures to accommodate culvert overflow without causing massive road fill failures.	2	30	CalFire, Campbell Timberland Management, CDFG, Redwood Forest Foundation, RPFs, RWQCB						0	These will likely be replaced as part of future timber harvest plans in the watershed.
UsC-A-24.3	Objective	Roads and Railroads	Reduce sediment sources from road networks, maintenance activities, and other actions that deliver sediment to stream channels through improved, or new, laws and policies, and/or enforcement of existing laws and policies.										
UsC-A-24.3.1	Recovery Action	Roads and Railroads	Establish a moratorium on new road construction within floodplains, riparian areas, unstable soils or other sensitive areas until a watershed specific and/or agency/company specific road management plan is created and implemented.										
UsC-A-24.3.1.1	Action Step	Roads and Railroads	For all rural (unpaved) and seasonal dirt roads apply (at a minimum) the road standards outlined in the California Forest Practice Rules.	1	60	CalFire, Campbell Timberland Management, Mendocino County Department of Public Works, Redwood Forest Foundation, State Parks						TBD	Most of the landowners in the Usal watershed operate under these standards. However, the County of Mendocino should adopt these standard for the Usal County Road (dirt).

Usal Creek (Lost Coast-Navarro Point) Threats and Associated Recovery Actions

Recovery Strategy Number	Level	Targeted Attribute or Threat	Action Description	Priority Number	Action Duration (Years)	Recovery Partners	Costs ($K)						Comments
							FY1	FY2	FY3	FY4	FY5	Entire Duration	
UsC-A-24.3.2	Recovery Action	Roads and Railroads	Use best management practices for road construction, maintenance, management and decommissioning (e.g. Hagans & Weaver, 1994; Sommarstrom, 2002; Oregon Department of Transportation, 1999).										
UsC-A-24.3.2.1	Action Step	Roads and Railroads	Develop a Road Sediment Reduction Plan that prioritizes sites and outlines implementation and a timeline of necessary actions.	3	10	CalFire, Campbell Timberland Management, CDFG, Redwood Forest Foundation						0	A lower priority due to the projected lack of timber harvest actions in the watershed for the next (approximately) ten years. A suitable plan for this watershed may incorporate a road sediment reduction plan as part of the future timber harvest planning scenario for the watershed.