Assessment of Stream Habitat Conditions, and Recommendations for Improvement, in the Noyo River Hydrologic Sub-Area

"Flying at the ECS" (photo by Jason Crews)

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Introduction

Over the past half-century, concerns over coastwide declines in distribution and abundance of California's coastal anadromous salmonids have led to escalating efforts to improve or restore stream habitat. The increasing efforts have included government regulation of land use, government grant incentive programs, and also changes in land use practices self-initiated by landowners.

Conditions affecting coastal salmonid populations in watersheds from the Oregon border to southern California vary greatly, including significant differences in geology, climate, vegetation, and land use. Accordingly, restoration strategies that are most effective in one area may not be in another. Regional and local efforts should be tuned to the most efficient and effective measures possible, based on best available scientific knowledge and data. This restoration planning assessment provides guidance to habitat restoration efforts in the Noyo River Hydrologic Sub-Area (HSA) in Mendocino County. It appraises habitat conditions, recommends measures to improve habitat, and identifies streams having particularly good habitat conditions.

"Calwater" is the working definition of watershed boundaries developed and used by California state agencies. Calwater defines the Noyo River HSA as the entire Noyo River watershed, and also several adjacent watersheds to the north and south that drain directly to the Pacific Ocean (Figure 1). The HSA is about 106,260 acres, or 166 square miles, in size; it has about 150 miles of perennial streams potentially usable by salmonids. The main anadromous salmonid species in the HSA are steelhead trout (*Oncorhynchus mykiss*) and coho salmon (*O. kisutch*).

The Noyo River HSA is one of 18 HSAs in the Calwater Mendocino Coast Hydrologic Unit (HU). A regional view of environmental conditions and salmonid populations in the HU is provided in *Assessment of Environmental Effects on Salmonids, with Emphasis on Habitat Restoration for Coho Salmon, in the Mendocino Coast Hydrologic Unit* (Albin and Law 2006). That document includes much foundation and context for this assessment, which is not repeated here.

To facilitate production and updating of this document with limited resources, all figures and tables are located at the end. Updates can occur as new information develops, for an adaptive restoration planning process. Comments and information concerning this assessment may be sent to the author at the email address on the cover page.

Methods

This assessment focuses on improving habitat for coho salmon rather than steelhead because 1) habitat conditions in the Mendocino Coast Hydrologic Unit are more restrictive for coho than steelhead, and 2) there is more information on habitat effects on coho than steelhead. Since there is a degree of competition between the two species, habitat conditions that favor coho can potentially disfavor steelhead.

Conditions

Habitat conditions for 51 streams were summarized from 52 stream habitat field surveys (the mainstem Noyo River has two surveys in different reaches). The surveys were conducted from 1994 through 2004 by the California Department of Fish and Game (CDFG) or by the Georgia Pacific Corporation (predecessor to Campbell Timberland Management). Total length of the stream surveys was 138 miles. The surveys used the methods of Flosi et al (1998). For each survey, data were summarized for the following six habitat variables:

- Length in Pools. Percent of stream length consisting of pools.
- Pool Depth. Average mean depth of pools, in feet.
- Pool Shelter. Average shelter rating for pools.
- Pool Dominant Fines. Percent of the pools in the stream where the dominant streambed substrate was classified as fine sediments (sand or silt/clay).
- Bank Vegetation. Average percent of streambanks vegetated.
- Canopy Shade. Average percent canopy over the stream.

Additionally, field notes from the surveys were reviewed to help identify other potentially significant characteristics such as potential migration barriers. Greater detail on the habitat condition variables can be found in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al. 1998).

Using data from 99 streams in the HU, Albin and Law (2006) conducted a statistical model analysis of the effects of stream habitat variables on coho salmon “presence” (the number of years coho were found in a particular stream, divided by the number of years field surveys were conducted to look for coho in that stream, with a minimum 5 years of surveys). From that analysis, habitat condition criteria were derived that estimate the relative effects of each of the six habitat variables on coho presence (Table 1). The criteria were then applied to habitat data from each stream in the Noyo HSA to develop habitat condition suitability ratings for each stream. The additive nature of the statistical model enables relative comparisons of suitability ratings across variables, and also across streams.

Stream habitat conditions are not static, and many of the habitat surveys are over a decade old. Additionally, habitat survey data are subject to systematic observer error. Therefore the habitat condition ratings were reviewed by biologists familiar with present local stream conditions and modified as appropriate.

Recommendations

Improvement recommendations for each stream were prioritized from the relative suitabilities of the habitat conditions described above, and also from habitat survey field notes and other available information. Improvement measures that treat the least suitable conditions were generally given higher priority, though there were exceptions as noted below. Recommendations were made for the following restoration project types:

- Add LWD. Large woody debris (LWD) is added to streams. This measure was recommended primarily to improve poor pool shelter ratings. LWD can also improve length in pools and pool depth, but those two habitat variables are often highly influenced by local physical conditions that cannot be altered (e.g. stream gradient, stream order). LWD can also help retain spawning gravels and sort streambed sediments. Projects to actively introduce LWD have immediate benefits. LWD that passively enters the stream, from events such as riparian tree fall and landslides, has less immediate benefits.
- Treat Sediment. Sediment sources are stabilized primarily through upgrading or decommissioning upslope roads, and removal of landing fills. This measure was recommended primarily to reduce pool dominant fines. Sediment treatment can also help improve pool depth and pool shelter depending on local conditions.
- Stabilize Streambanks. Bank stabilization may involve bank slope excavation, planting riparian vegetation, fencing, bioengineering, or rock armoring. This measure was recommended primarily to increase bank vegetation, but because it reduces erosion, it may also improve pool depth, pool shelter, and pool dominant fines in downstream reaches. Streambanks are relatively stable, and bank stabilization projects relatively uncommon, in the Noyo HSA compared to some other areas on California's north coast.
- Increase Canopy. Projects to actively increase shade canopy over the stream may involve riparian conifer planting or riparian zone fencing to exclude livestock and deer. This measure was recommended primarily to increase canopy shade. Project success is greatly dependent on local conditions such as riparian soil quality and active channel width. In previously harvested riparian areas where soil conditions are good and sufficient riparian trees now exist, but are merely too small, shade canopy will passively increase over time if riparian trees are not harvested. The passive strategy is generally appropriate in the Noyo HSA, though exceptions may exist.
- Trap Spawning Gravel. This recommendation was based on field survey notes or other information indicating potential lack of spawning habitat. There is no numerical standard for how much spawning habitat is sufficient, so this recommendation especially requires field verification by experienced fisheries biologists. Sufficient suitable spawning habitat is usually present in north coast streams. Lack of spawning gravel in a small tributary is not significant if such habitat exists in the receiving stream. Projects to trap spawning gravels may involve placement of rock or wood structures designed to trap gravels in pool tailouts.
- Potential Culvert Barriers. This recommendation was based on field survey notes or other information indicating culverts may completely or partially block fish migration. Barrier status should be verified by field review and analysis using methods described in Part IX of the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al. 1998). Potential barriers generally received high priority if near the stream mouth, and lower priority if high up the stream.
- Potential LDA Barriers. This recommendation was based on field survey notes or other information that large debris accumulations (LDAs), usually "log jams", are retaining at least several feet of sediment and may create barriers to migration. Since large amounts of wood were cleared from streams over the past several

decades, few LDAs now exist that impede fish passage. Salmonids are remarkably agile in passing formidable-looking LDAs. LDAs are also subject to alteration or removal by peak flow events, and should be carefully evaluated in the field by experienced fisheries biologists. In general, LDAs should be left alone unless it is clear the LDA is persistent over many years, is a true barrier, and blocks a substantial length of good stream habitat. LDA treatment should minimize shortening of wood pieces so the pieces can reposition to enhance instream shelter.

Like the habitat condition ratings, the stream improvement recommendations were reviewed by biologists familiar with present local stream conditions and modified as appropriate.

Priority streams

A list of "priority" streams having good overall habitat conditions was developed from the aggregate habitat condition ratings for the streams, and consultation with local fishery biologists. The purpose of developing such a list is to give high preference for restoration and protection of the best habitat and fish populations in a watershed to avoid local extinction, and to provide potential repopulation sources for nearby streams. Such streams are sometimes called "source" or "refugia" streams.

Habitat conditions

Habitat survey variables

The habitat variables generally having the least suitability over the HSA are length in pools and pool shelter (Figure 2, Table 2). Suitability of pool depth is generally high. Suitability of pool dominant fines is generally high, though some streams, including a long reach of the middle mainstem Noyo River, have poor ratings (Figure 3, Table 2). Suitabilities of riparian bank vegetation and shade canopy are generally high (Figure 4, Table 2). However again the middle mainstem Noyo River is an exception, with poor canopy condition despite good streambank vegetation condition.

The habitat condition ratings indicate that, of the conditions examined, length in pools and pool shelter are the conditions having the greatest limiting effects on coho salmon in Noyo HSA streams.

Water temperature data

Water temperature monitoring data are expressed as maximum weekly average temperature (MWAT). MWATs less than 16 ^{o}C are suitable for coho salmon in HU streams (Albin and Law 2006, Flosi et al 1998). MWAT data indicate that water temperatures are generally suitable for coho in the Pacific Ocean tributaries sub basin, including Pudding Creek and Hare Creek, and also in the South Fork Noyo River and tributaries (Figure 4). Water temperatures are less suitable in the mainstem Noyo River, which has poor canopy shade (Figure 4, Table 2). Water temperatures are also less suitable in several tributaries to the upper mainstem including North Fork Noyo River, Hayworth Creek, North Fork Hayworth Creek, Olds Creek, Redwood Creek, and Burbeck Creek, despite suitable canopy shade in many of those tributaries.

Recommendations

The most common recommendation is addition of LWD (Table 3), which is recommended in 44 of the 52 stream surveys. Addition of LWD directly addresses poor pool shelter conditions

widespread in the HSA. Sediment treatment is recommended for 19 of the 52 stream segments. In the Upper Noyo River sub basin, the priority for sediment treatment for several streams is elevated higher than suggested by the stream condition ratings, in order to help treat poor sediment conditions downstream in the middle mainstem Noyo River. Increasing canopy is recommended in 9 of the 52 stream segments. In the Upper Noyo River sub basin, the priority for canopy increase for several streams is raised higher than suggested by the stream condition ratings, because MWAT values are less than suitable for coho.

The improvement recommendations can be used as a starting point to develop restoration projects applicable to a local stream or its watershed. Because conditions may change over time, up-to-date field review of stream and watershed conditions is a necessary requisite to project plan development.

Priority streams

The following are identified as priority streams, with relatively high quality overall habitat conditions:

- Pudding Creek
- Hare Creek
- Little North Fork Noyo River
- South Fork Noyo River
- Kass Creek
- North Fork South Fork Noyo River
- Parlin Creek
- North Fork Noyo River
- Hayworth Creek

Trout Unlimited's North Coast Coho Project (Trout Unlimited 2005), through cooperation and support from Mendocino Redwood Company and Campbell Timberland Management, has already initiated or completed road upgrade and decommission projects on Pudding Creek, North Fork Noyo River, and Hayworth Creek. Additional work to introduce wood is recommended in many of those streams (Table 3). However the relatively high overall habitat quality in those streams is reflected in their relative lack of higher priority recommendations

Coho recovery strategy

The *Recovery Strategy for California Coho Salmon* (CDFG 2004) includes recommended tasks specific to the Noyo River HSA to facilitate coho salmon recovery (Table 4). The strategy is subject to new information and update of recommendations, available on the CDFG web site.

In-progress and completed projects

The California Habitat Restoration Projects Database, maintained by the CDFG and Pacific States Marine Fisheries Commission, tracks projects funded by CDFG since the early 1980's. The database lists 14 completed or ongoing projects in the Noyo HSA (Figure 5, Table 5).

References cited

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Flosi, G., S. Downie, J. Hopelain, M. Bird, R. Coey, and B. Collins. 1998. California salmonid stream habitat restoration manual. 3rd edition. California Department of Fish and Game, Sacramento, California.

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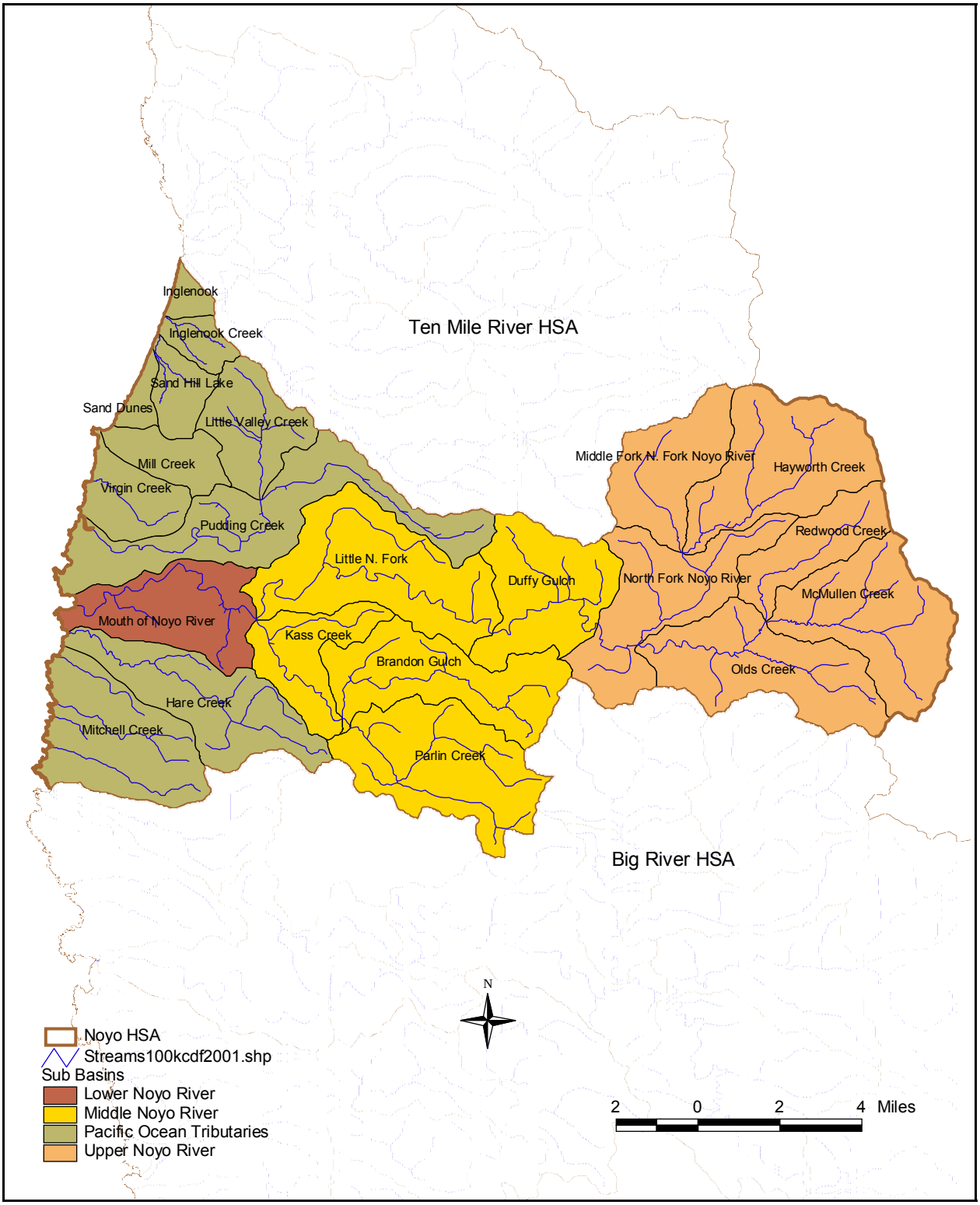

Figure 1. Noyo River HSA and sub-basins.

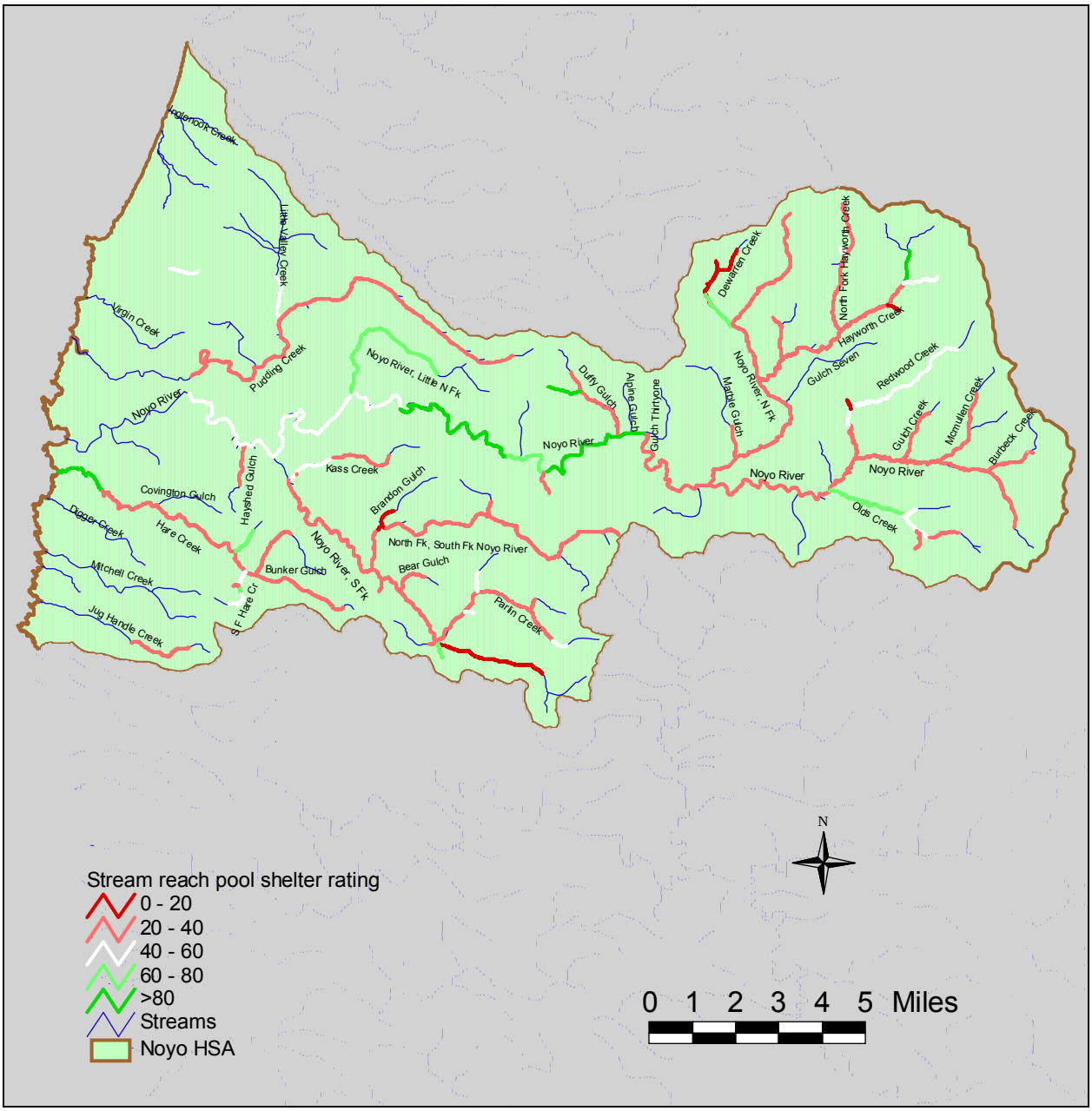

Figure 2. Noyo HSA mean shelter rating in pool habitat units from stream habitat surveys (years 1994 – 2004). (Data: Campbell Timberland Management, CDFG)

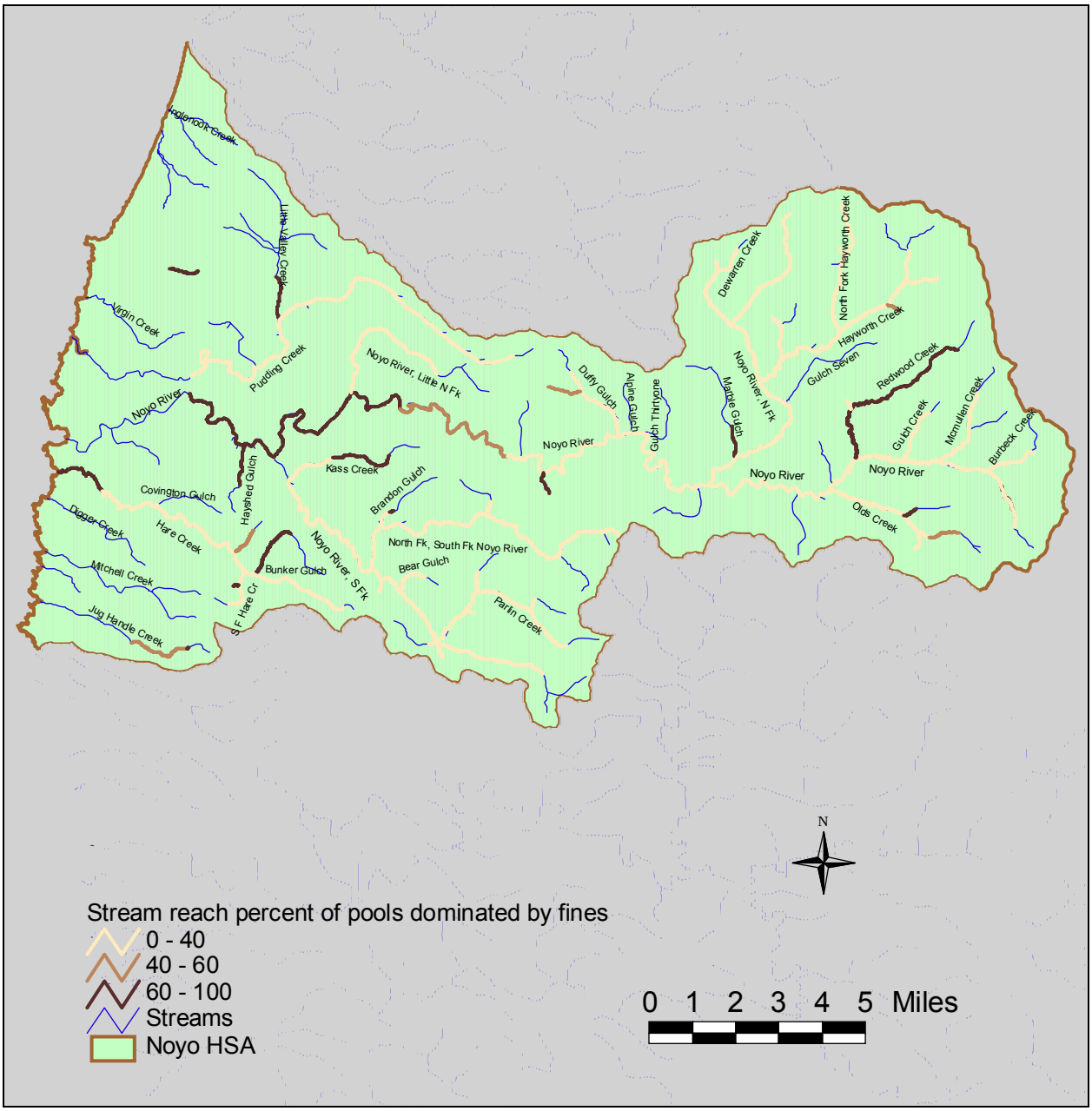

Figure 3. Noyo HSA percent of pool habitat units with streambed sediment dominated by fine sediments (silt/clay or sand) from stream habitat surveys (years 1994 – 2004). (Data: Campbell Timberland Management, CDFG)

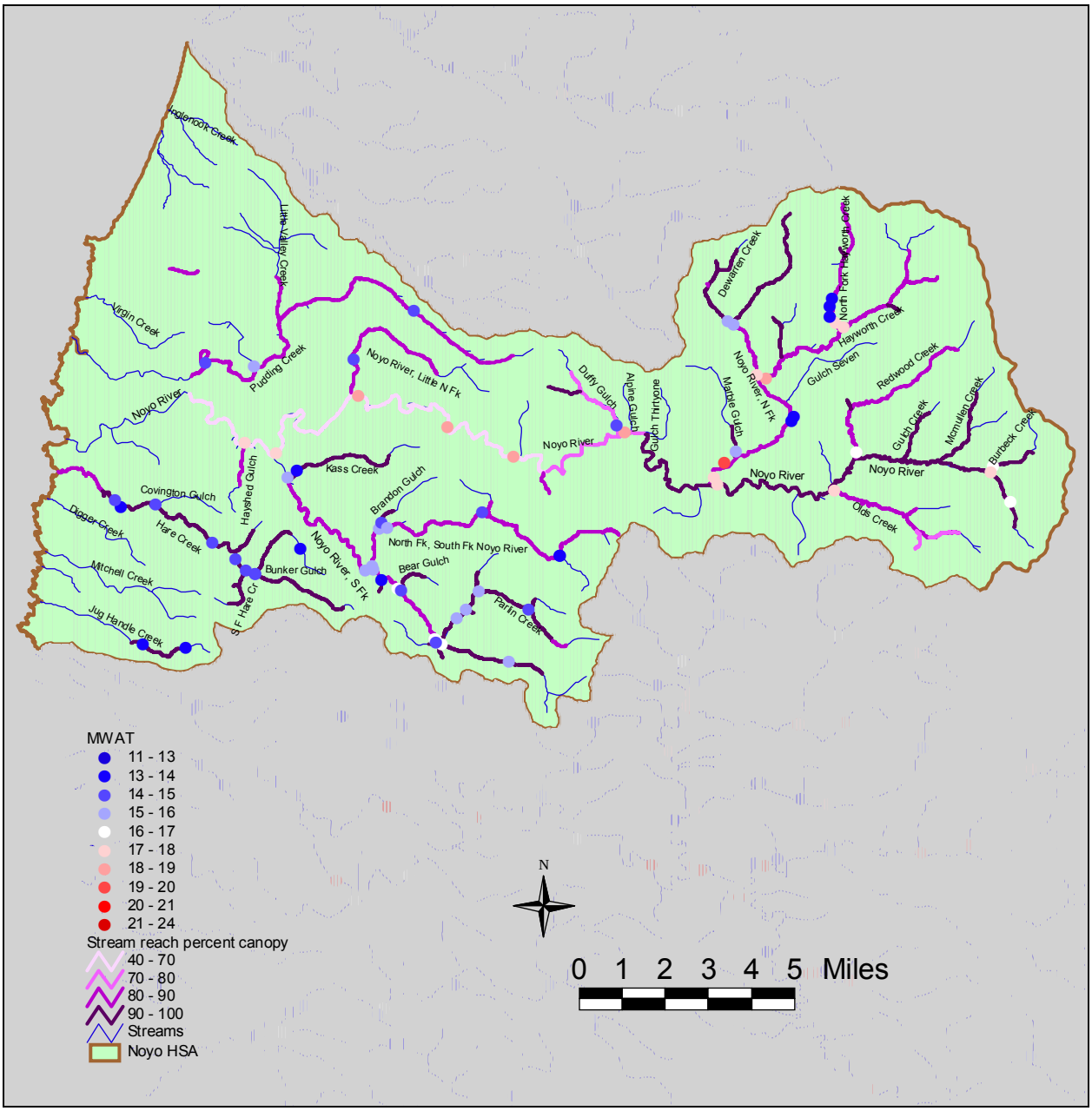

Figure 4. Noyo HSA mean MWAT (degrees C) at 66 stations (years 1991-2003, sample size range 1 – 11 years), and percent canopy from stream habitat surveys (years 1994 – 2004). (Data: Campbell Timberland Management, Mendocino Redwood Co., Jackson Demonstration State Forest, CDFG)

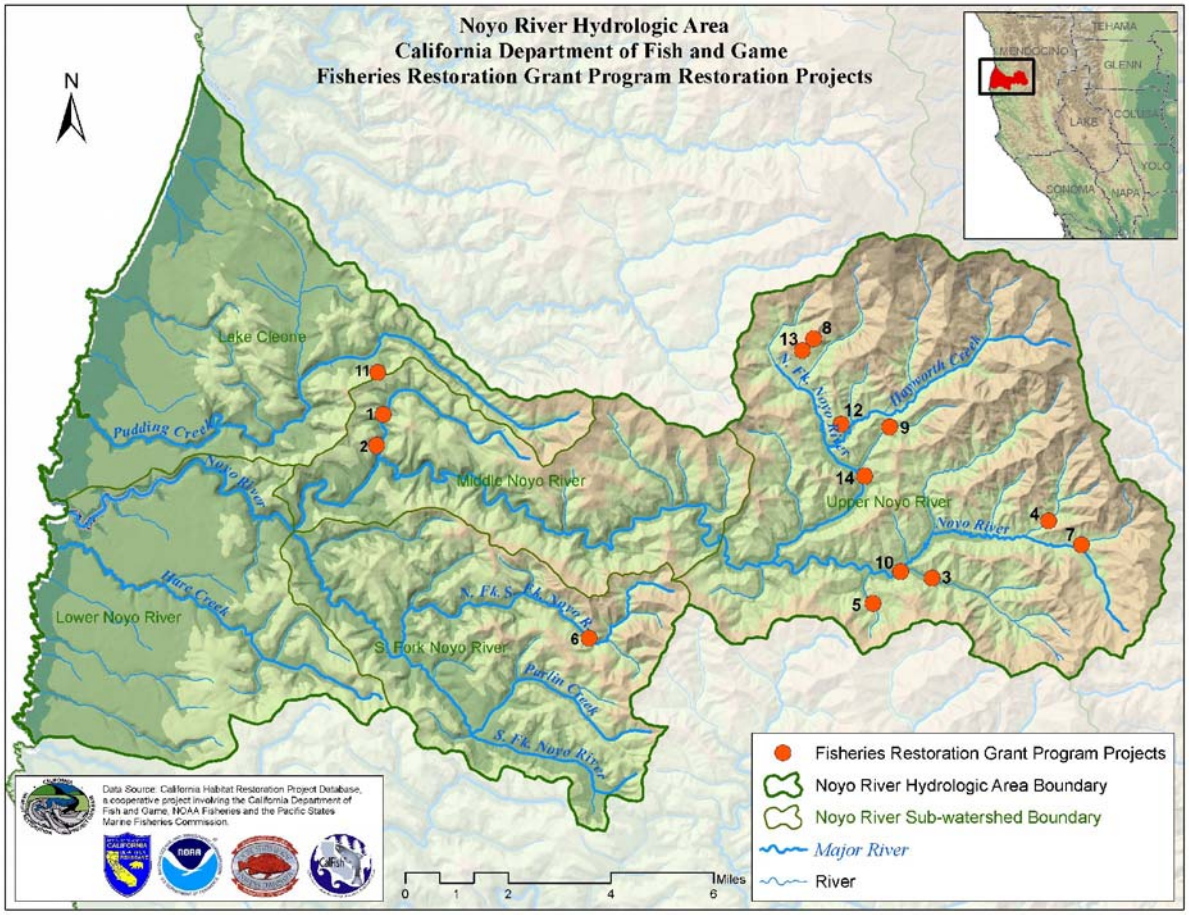

Figure 5. Noyo River HSA projects from California Habitat Restoration Project Database.

Table 1. Habitat condition criteria and suitability rating key for stream habitat survey variables. "Effect" indicates the relative degree to which the condition negatively affects coho salmon, derived from Albin and Law (2006).

Portion of Stream Length in Pools (%)		**Average of Pool Mean Depth (ft)**		**Average of Pool Shelter Rating**		**Portion of Pools Dominated by Fines (%)**		**Average of % Streambanks Vegetated**		**Average of % Canopy**	
Range	*Effect*	*Range*	*Effect*	*Range*	*Effect*	*Range*	*Effect*	*Range*	*Effect*	*Range*	*Effect*
<18	-0.5	<0.8	-0.2	<25	-0.4	<25	0	<58	-0.3	<80	-0.4
18 - 20	-0.4	0.8 - 1.25	-0.1	25 - 35	-0.3	25 - 45	-0.1	58 - 62	-0.2	80 - 85	-0.3
20 - 23	-0.3	≥1.25	0	35 - 55	-0.2	45 - 60	-0.2	62 - 65	-0.1	85 - 87	-0.2
23 - 37	-0.2			55 - 80	-0.1	60 - 70	-0.3	≥65	0	87 - 93	-0.1
37 - 43	-0.1			≥80	0	≥70	-0.4			≥93	0
43 - 50	0										
50 - 53	-0.1										
≥53	-0.2										

Suitability Rating Key

Effect:	0	-0.1	-0.2	-0.3	-0.4	-0.5
Rating:	+++	++	+	-	--	---

Table 2. Survey length, year, and condition ratings from stream habitat surveys in Noyo River HSA. Condition ratings range from highest suitability (+++) to lowest suitability (---).

Stream	Survey Length (mi)	Survey Year	Length in Pools	Pool Depth	Pool Shelter	Pool Dominant Fines	Bank Vegetation	Canopy Shade
Pacific Ocean Tributaries								
Mill Creek	0.66	1996	++	+	+	--	+++	++
Pudding Creek	11.89	1994	+	++	+	+++	+++	++
Little Valley Creek	1.16	1994	+	+++	+	--	+++	+
Hare Creek	10.18	1995	++	+++	++	++	+++	++
Bunker Gulch	1.32	1995	+	++	-	-	+++	+++
Walton Gulch	0.63	1995	+	++	++	++	+++	+++
South Fork Hare Creek	1.03	1995	+	++	++	+++	+++	+++
Unnamed Trib SF Hare Cr	0.14	1995	+	+	-	-	+++	+++
Jug Handle Creek	1.63	1996	+	++	+	+	+++	+++
Lower Noyo River								
Hayshed Gulch	1.06	1996	+	+	-	--	+++	+
Middle Noyo River								
Noyo River (middle)	17.23	1996	+	+++	++	--	+++	--
Duffy Gulch	1.86	1996	-	+	-	++	-	--
Unnamed Duffy Gulch Trib	0.59	1996	---	++	+++	-	+++	++
Little North Fork Noyo River	4.25	1996	--	+++	++	++	+++	++
Switchback Gulch	0.28	1996	---	+	+	-	+++	++
South Fork Noyo River	9.60	1995	+	+++	--	+++	+++	++
Kass Creek	3.03	1996	+	++	+	+	+++	++
Unnamed Trib to Kass Creek	0.02	1996	+++	++	-	++	-	+++
Bear Gulch	0.80	1995	+	++	--	+++	+++	+++
N Fork S Fork Noyo R	8.80	1996	+	++	-	+++	+++	++
Brandon Gulch	0.48	1996	+	++	--	+++	+++	++
Unnamed Trib NFSF Noyo R	0.33	1996	+	+	-	++	+++	++
SF Noyo Unnamed Trib A	0.17	1995	++	++	+	+++	+++	+++
SF Noyo Unnamed Trib B	0.38	1995	++	++	++	+++	+++	+++
Parlin Creek	4.03	1995	+++	++	++	+++	+++	++
Parlin Cr Unnamed Trib A	0.45	1995	++	++	+	+++	+++	+++
Parlin Cr Unnamed Trib B	0.33	1995	+	+	-	+++	+++	++
Waldo Gulch	0.20	1995	+	++	+	++	+++	+++
Peterson Gulch	0.27	1995	-	++	+	++	+++	+++
Upper Noyo River								
Noyo River (upper)	13.63	2004	++	+++	-	++	+++	+++
NF Noyo R	6.60	2003	+	+++	+	-	-	++
Dewarren Creek	1.63	1999	+	+	--	++	+++	+++
Unnamed Trib1 Dewarren Cr	0.04	1999	+	+	--	+++	+++	++
Unnamed Trib2 Dewarren Cr	0.24	1999	++	+	--	++	+++	++
Hayworth Creek	6.24	1999	+	+++	-	-	+++	++
UnnamedTrib Hayworth Cr	1.08	1999	---	++	+++	+++	+++	-
Panther Gulch	1.08	1999	---	++	--	++	+++	+++
Soda Creek	0.55	1999	-	++	--	++	+++	+++
North Fork Hayworth Creek	3.02	1999	---	+++	-	-	+++	++
Unnamed Trib to NF Hayw Cr	0.21	1999	---	++	+	+++	+	+++
Marble Gulch	0.77	1999	+++	++	-	-	+++	+++
Middle Fork N Fork Noyo R	3.88	1999	---	+	-	+++	+++	++
Olds Creek	4.23	2000	+	++	++	++	+++	-
LB Trib #5 to Olds Cr	0.48	2000	---	+	+	++	+++	--

Stream	Survey Length (mi)	Survey Year	Length in Pools	Pool Depth	Pool Shelter	Pool Dominant Fines	Bank Vegetation	Canopy Shade
RB Trib #5 to Olds Cr	0.33	2000	++	+	+	--	+++	-
RB Trib #6 to Olds Cr	0.64	2000	---	++	-	+	++	--
Redwood Cr	5.42	2000	--	++	+	-	++	++
Unnamed trib to Redwood Cr	0.18	2000	---	+	--	+++	-	++
Gulch C (Gulch Cr)	1.27	2003	---	++	+	+++	-	+++
Burbeck Creek	1.26	2003	---	++	-	+++	-	++
Unnamed trib to Burbeck Cr	0.19	2003	---	+++	-	+++	-	+++
McMullen Creek	2.11	2003	---	++	--	+++	+++	+++

Table 3. Prioritized habitat improvement recommendations for Noyo River HSA streams (1 is highest priority).

Stream	Add LWD	Treat Sedi-ment	Stabilize Stream-banks	In-crease Canopy	Trap Spawning Gravel	Potential Culvert Barriers	Potential LDA Barriers	Comments
Pacific Ocean Tributaries								
Mill Creek	2	1				1		Gates and Humboldt xing at mouth barrier.
Pudding Creek*	2							
Little Valley Creek *	2	1		2	3			Upper wshed ditched, grazed. Potential high qual coho habitat.
Hare Creek*								Experimental LWD added since survey.
Bunker Gulch*	1	1				3		8' dia culverts at 1869' and 2499'
Walton Gulch						1		Evaluate road 400 culvert at 61' for barrier.
South Fork Hare Creek*								
Unnamed Trib SF Hare Cr	1	1						
Jug Handle Creek	2	2						
Lower Noyo River								
Hayshed Gulch	1	1		2				
Middle Noyo River								
Noyo River (middle)		1		1				
Duffy Gulch	1		2	1		1		Check railroad xing.
Unnamed Duffy Gulch Trib		2						Small stream, low priority habitat, no salmonids observed.
Little North Fork Noyo River*	2							
Switchback Gulch	2	2					3	No fish seen above LDA at 168'. Small stream, low priority habitat
South Fork Noyo River*	1							
Kass Creek*	2	2				2		Locate & evaluate barrier mid reach
Unnamed Trib to Kass Creek	3		3					Small stream, low priority habitat.
Bear Gulch	1						3	
N Fork S Fork Noyo R*	1							
Brandon Gulch	1				3			
Unnamed Trib NFSF Noyo R	1							
SF Noyo Unnamed Trib A	2							
SF Noyo Unnamed Trib B								
Parlin Creek*							3	LDA at 15,856' blocks coho? Experimental LWD added since survey.
Parlin Cr Unnamed Trib A	2							
Parlin Cr Unnamed Trib B	2							

Stream	Add LWD	Treat Sedi-ment	Stabilize Stream-banks	In-crease Canopy	Trap Spawning Gravel	Potential Culvert Barriers	Potential LDA Barriers	Comments
Waldo Gulch	2							
Peterson Gulch	2							
Upper Noyo River								
Noyo River (upper)	1	2						
NF Noyo R*	2	2	2					
Dewarren Creek*	1							
Unnamed Trib1 Dewarren Cr	1							
Unnamed Trib2 Dewarren Cr	1							
Hayworth Creek*	1	2					3	
UnnamedTrib Hayworth Cr*				1				
Panther Gulch*	1							
Soda Creek	1						3	
North Fork Hayworth Creek*	1	2						
Unnamed Trib to NF Hayw Cr	2							
Marble Gulch	1	1						
Middle Fork N Fork Noyo R*	1						3	
Olds Creek		2		1				
LB Trib #5 to Olds Cr	2			2				
RB Trib #5 to Olds Cr	2	1		2				
RB Trib #6 to Olds Cr	1	2		2				
Redwood Cr	2	1						
Unnamed trib to Redwood Cr	1		2			1		Jump 2' to culvert at 86'.
Gulch C (Gulch Cr)	2		2			1		Perched culvert near mouth.
Burbeck Creek	1		2		3			
Unnamed trib to Burbeck Cr	1		2					
McMullen Creek	1					1		Check railroad barrier near mouth.

*Priority stream or major tributary to priority stream

Table 4. Current coho recovery strategy recommendations for Noyo HSA. (www.dfg.ca.gov/nafwb/CohoRecovery/tasks.asp)

TASK NUM	ESU	LEVEL	PRIORITY	TASK
MC-NO-01	CCC	E	4	Investigate the role of the Pudding Creek Dam impoundment in coho migration and freshwater survival rate.
MC-NO-02	CCC	C	4	If appropriate, repair the Pudding Creek Dam.
MC-NO-03	CCC	C	4	Implement actions of a sediment reduction plan to improve water quality.
SUBJECT	SEDIMENT			
MC-NO-04	CCC	E	4	Fund activities to address sediment sources and barriers to coho salmon passage on the California Western Railway right-of-way.
MC-NO-05	CCC	D	4	Remove barriers to coho salmon passage on the California Western Railway right-of-way.
MC-NO-06	CCC	C	4	Evaluate the biological justification for the egg-taking station on the South Fork Noyo River.

Table 5. Noyo River HSA project summaries from California Habitat Restoration Project Database.

Map Label	Fiscal Year	Status	Project Title	Purpose	DFG Funding
1	83/84	Completed	Little North Fork Noyo River Log Jam Modification Project	Remove fish migration barriers. Revegetate potential erosion sites.	$12,500
2	84/85	Completed	Mendocino County Anadromous Stream Restoration	Remove/modify instream debris barriers to provide access to spawning and nursery areas.	$250,000
3	88/89	Completed	Olds Creek Restoration Project	Barrier modification and placement of logs to create pools and provide summer cover for juvenile salmonids.	$16,238
4	88/89	Completed	McMullen Creek Restoration Project	Modification of log jams on McMullen Creek above the Noyo River.	$13,654
5	88/89	Completed	Section 15 Restoration Project	Barrier modification and placement of logs to create pools and provide summer cover for juvenile salmon.	$27,267
6	88/89	Completed	North Fork of the South Fork of Noyo River Restoration Project	Barrier modification and placement of logs to create pools and provide summer cover for juvenile salmon.	$52,810
7	88/89	Completed	Burbeck Creek Restoration Project	Barrier modification and placement of logs to create pools and provide cover for juvenile salmonids.	$2,937
8	99/00	Completed	Upper North Fork Noyo River Watershed Assessment Project	Upslope sediment assessment of the upper North Fork Noyo River, with upslope and instream restoration prescriptions.	$19,775
9	01/02	Completed	Hayworth Creek Sediment Control and Fish Passage Improvement	Control an estimated 8,900 cubic yards of sediment deliverable to Hayworth Creek, improve fish passage to approximately 1 mile of rearing and potential spawning habitat on Gulch Seven by removing 2 culverts and installing 2 bridges.	$89,711
10	01/02	Completed	Irmulco Road Corporation Watershed Planning Project	Develop site specific and prioritized plan for cost-effective erosion prevention, erosion control and habitat restoration along the 28 miles of Irmulco Road and adjacent roads.	$21,083
11	02/03	Ongoing	Pudding Creek Watershed Restoration Project	Implement upslope restoration prescriptions to reduce road-related sediment in the Pudding Creek watershed.	$96,532
12	03/04	Ongoing	Hayworth Creek and N. Fk. Noyo River Large Wood Enhancement Project	55 pieces of large woody debris will be added Hayworth Creek and the NF Noyo River in the form of 35 instream habitat improvement structures, increasing the amount of complex cover and improving the quality of rearing habitat for salmonids.	$30,422
13	03/04	Ongoing	8.5 Mile Road Decommissioning Project, Upper North Fork Noyo	Implement site specific and prioritized road decommissioning on 8.5 miles of road in the Upper North Fork Noyo River watershed.	$137,495
14	04/05	Ongoing	Irmulco Road-Upper North Fork Noyo River Restoration Project	Implement site specific and prioritized road upgrades and decommissioning in the Upper North Fork Noyo River Watershed and along the Irmulco Road.	$478,322