

STREAM INVENTORY REPORT

Parlin Creek

INTRODUCTION

A stream inventory was conducted during June 28 to July 12, 2006 on Parlin Creek. The survey began at the confluence with South Fork Noyo River and extended upstream 3.2 miles.

The objective of this report is to document the current habitat conditions and recommend options for the potential enhancement of habitat for coho salmon and steelhead trout. Recommendations for habitat improvement activities are based upon target habitat values suitable for salmonids in California's north coast streams. Recommendations for habitat improvement activities are based upon target habitat values suitable for salmonids in California's north coast streams.

WATERSHED OVERVIEW

Parlin Creek is a tributary to South Fork Noyo River, a tributary to Noyo River, a tributary to the Pacific Ocean, located in Mendocino County, California (Map 1). Parlin Creek's legal description at the confluence with South Fork Noyo River is T17N R16W S04 and its LLID is 1236581393696. Its location is 39°22'11" north latitude and 123°39'29" west longitude. Parlin Creek is a first order stream and has approximately 4.2 miles of blue line stream according to the USGS Noyo Hill 7.5 minute quadrangle. Parlin Creek drains a watershed of approximately 4.5 square miles. Elevations range from about 180 feet at the mouth of the creek to 500 feet in the headwater areas. Redwood/Douglas fir forest dominates the watershed. The watershed is entirely within Jackson State Forest and is managed for timber production and recreation. Vehicle access exists via a locked gate off Route 20 at Parlin Fork Conservation Camp.

METHODS

The habitat inventory conducted in Parlin Creek follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al, 1998). The California Conservation Corps (CCC) Technical Advisors and Watershed Stewards Project/AmeriCorps (WSP/AmeriCorps) Members that conducted the inventory were trained in standardized habitat inventory methods by the California Department of Fish and Game (DFG). This inventory was conducted by a two-person team.

SAMPLING STRATEGY

The inventory uses a method that samples approximately 10% of the habitat units within the survey reach. All habitat units included in the survey are classified according to habitat type and their lengths are measured. All pool units are measured for maximum depth, depth of pool tail crest (measured in the thalweg), dominant substrate composing the pool tail crest, and

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embeddedness. Habitat unit types encountered for the first time are measured for all the parameters and characteristics on the field form. Additionally, from the ten habitat units on each field form page, one is randomly selected for complete measurement. All pools except step-pools are fully sampled.

HABITAT INVENTORY COMPONENTS

A standardized habitat inventory form has been developed for use in California stream surveys and can be found in the *California Salmonid Stream Habitat Restoration Manual*. This form was used in Parlin Creek to record measurements and observations. There are eleven components to the inventory form.

1. Flow:

Flow is measured in cubic feet per second (cfs) near the bottom of the stream survey reach using a Marsh-McBirney Model 2000 flow meter.

2. Channel Type:

Channel typing is conducted according to the classification system developed and revised by David Rosgen (1994). This methodology is described in the *California Salmonid Stream Habitat Restoration Manual*. Channel typing is conducted simultaneously with habitat typing and follows a standard form to record measurements and observations. There are five measured parameters used to determine channel type: 1) water slope gradient, 2) entrenchment, 3) width/depth ratio, 4) substrate composition, and 5) sinuosity. Channel characteristics are measured using a clinometer, hand level, hip chain, tape measure, and a stadia rod.

3. Temperatures:

Both water and air temperatures are measured and recorded at every tenth habitat unit. The time of the measurement is also recorded. Both temperatures are taken in degrees Fahrenheit at the middle of the habitat unit and within one foot of the water surface.

4. Habitat Type:

Habitat typing uses the 24 habitat classification types defined by McCain and others (1990). Habitat units are numbered sequentially and assigned a type identification number selected from a standard list of 24 habitat types. Dewatered units are labeled "dry". Parlin Creek habitat typing used standard basin level measurement criteria. These parameters require that the minimum length of a described habitat unit must be equal to or greater than the stream's mean wetted width. All measurements are in feet to the nearest tenth. Habitat characteristics are measured using a clinometer, hip chain, and stadia rod.

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5. Embeddedness:

The depth of embeddedness of the cobbles in pool tail-out areas is measured by the percent of the cobble that is surrounded or buried by fine sediment. In Parlin Creek, embeddedness was ocularly estimated. The values were recorded using the following ranges: 0 - 25% (value 1), 26 - 50% (value 2), 51 - 75% (value 3) and 76 - 100% (value 4). Additionally, a value of 5 was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate like bedrock, log sills, boulders or other considerations.

6. Shelter Rating:

Instream shelter is composed of those elements within a stream channel that provide juvenile salmonids protection from predation, reduce water velocities so fish can rest and conserve energy, and allow separation of territorial units to reduce density related competition for prey. The shelter rating is calculated for each fully-described habitat unit by multiplying shelter value and percent cover. Using an overhead view, a quantitative estimate of the percentage of the habitat unit covered is made. All cover is then classified according to a list of nine cover types. In Parlin Creek, a standard qualitative shelter value of 0 (none), 1 (low), 2 (medium), or 3 (high) was assigned according to the complexity of the cover. Thus, shelter ratings can range from 0-300 and are expressed as mean values by habitat types within a stream.

7. Substrate Composition:

Substrate composition ranges from silt/clay sized particles to boulders and bedrock elements. In all fully-described habitat units, dominant and sub-dominant substrate elements were ocularly estimated using a list of seven size classes and recorded as a one and two, respectively. In addition, the dominant substrate composing the pool tail-outs is recorded for each pool.

8. Canopy:

Stream canopy density was estimated using modified handheld spherical densimeters as described in the *California Salmonid Stream Habitat Restoration Manual*. Canopy density relates to the amount of stream shaded from the sun. In Parlin Creek, an estimate of the percentage of the habitat unit covered by canopy was made from the center of approximately every third unit in addition to every fully-described unit, giving an approximate 30% sub-sample. In addition, the area of canopy was estimated ocularly into percentages of coniferous or hardwood trees.

9. Bank Composition and Vegetation:

Bank composition elements range from bedrock to bare soil. However, the stream banks are usually covered with grass, brush, or trees. These factors influence the ability of stream banks to withstand winter flows. In Parlin Creek, the dominant composition type and the dominant vegetation type of both the right and left banks for each fully-described unit were selected from the habitat inventory form. Additionally, the percent of each bank covered by vegetation (including downed trees, logs, and rootwads) was estimated and recorded.

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10. Large Woody Debris Count:

Large woody debris (LWD) is an important component of fish habitat and an element in channel forming processes. In each habitat unit all pieces of LWD partially or entirely below the elevation of bankfull discharge are counted and recorded. The minimum size to be considered is twelve inches in diameter and six feet in length. The LWD count is presented by reach and is expressed as an average per 100 feet. approximate 30% sub-sample.

11. Average Bankfull Width:

Bankfull width can vary greatly in the course of a channel type stream reach. This is especially true in very long reaches. Bankfull width can be a factor in habitat components like canopy density, water temperature, and pool depths. Frequent measurements taken at riffle crests (velocity crossovers) are needed to accurately describe reach widths. At the first appropriate velocity crossover that occurs after the beginning of a new stream survey page (ten habitat units), bankfull width is measured and recorded in the appropriate header block of the page. These widths are presented as an average for the channel type reach.

BIOLOGICAL INVENTORY

Biological sampling during the stream inventory is used to determine fish species and their distribution in the stream. Fish presence was observed from the stream banks in Parlin Creek.

DATA ANALYSIS

Data from the habitat inventory form are entered into Stream Habitat 2.0.18, a Visual Basic data entry program developed by Karen Wilson, Pacific States Marine Fisheries Commission in conjunction with the California Department of Fish and Game. This program processes and summarizes the data, and produces the following ten tables:

- Riffle, Flatwater, and Pool Habitat Types
- Habitat Types and Measured Parameters
- Pool Types
- Maximum Residual Pool Depths by Habitat Types
- Mean Percent Cover by Habitat Type
- Dominant Substrates by Habitat Type
- Mean Percent Vegetative Cover for Entire Stream
- Fish Habitat Inventory Data Summary by Stream Reach (Table 8)
- Mean Percent Dominant Substrate / Dominant Vegetation Type for Entire Stream
- Mean Percent Shelter Cover Types for Entire Stream

Graphics are produced from the tables using Microsoft Excel. Graphics developed for Parlin Creek include:

- Riffle, Flatwater, Pool Habitat Types by Percent Occurrence

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- Riffle, Flatwater, Pool Habitat Types by Total Length
- Total Habitat Types by Percent Occurrence
- Pool Types by Percent Occurrence
- Maximum Residual Depth in Pools
- Percent Embeddedness
- Mean Percent Cover Types in Pools
- Substrate Composition in Pool Tail-outs
- Mean Percent Canopy
- Dominant Bank Composition by Composition Type
- Dominant Bank Vegetation by Vegetation Type

HABITAT INVENTORY RESULTS

* ALL TABLES AND GRAPHS ARE LOCATED AT THE END OF THE REPORT *

The habitat inventory of June 28 to July 12, 2006, was conducted by Corby Hines and John Caldwell, Pacific States Marine Fisheries Commission (PSMFC) Fisheries Technicians. The total length of the stream surveyed was 16,760 feet.

Stream flow was measured near the bottom of the survey reach with a Marsh-McBirney Model 2000 flowmeter at 2.1 cfs on July 6, 2006.

Parlin Creek is an F4 channel type for the first 13,286 feet of the stream surveyed (Reach 1) and a B4 channel type for the remaining 3,474 feet of the stream surveyed (Reach 2). F4 channels are entrenched, meandering, riffle/pool channels on low gradients with high width/depth ratios and gravel-dominant substrates. B4 channels are moderately entrenched riffle dominated channels with infrequently spaced pools, very stable plan and profile, stable banks on moderate gradients with low width /depth ratios and gravel dominant substrates.

Water temperatures taken during the survey period ranged from 55 to 62 degrees Fahrenheit. Air temperatures ranged from 56 to 72 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 33% flatwater units, 24% riffle units, and 42% pool units, (Graph 1). Based on total length of Level II habitat types there were 58% flatwater units, 18% riffle units, and 24% pool units, (Graph 2).

Ten Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were 30% mid-channel pools, 25% step runs, and 24% low gradient riffles (Graph 3). Based on percent total length, 51% were step run units, 18% were low gradient riffle units, and 16% were mid-channel pool units.

A total of 89 pools were identified (Table 3). Main channel pools were the most frequently encountered, at 79%, and comprised 75% of the total length of all pools (Graph 4).

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Table 4 is a summary of maximum residual pool depths by pool habitat types. Pool quality for salmonids increases with depth. Sixty-four of the 89 pools (72%) had a residual depth of two feet or greater (Graph 5).

Twenty-four of the 89 pools (27%) had a residual depth of three feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 89 pool tail-outs measured, 34 had a value of 1 (38%); 28 had a value of 2 (32%); 12 had a value of 3 (14%); 8 had a value of 4 (9%); and 7 had a value of 5 (8%); (Graph 6). On this scale, a value of 1 indicates the best spawning conditions and a value of 4 the worst. Additionally, a value of 5 was assigned to tail-outs deemed not suitable for spawning due to inappropriate substrate like bedrock, log sills, boulders, etc.

A shelter rating was calculated for each habitat unit and expressed as a mean value for each habitat type within the survey using a scale of 0-300. Riffle habitat types had a mean shelter rating of 31, flatwater habitat types had a mean shelter rating of 38, and pool habitats had a mean shelter rating of 68 (Table 1). Of the pool types, the main channel pools had a mean shelter rating of 70, Scour pools had a mean shelter rating of 62, (Table 3).

Table 5 summarizes mean percent cover by habitat type. Large woody debris is the dominant cover type in Parlin Creek. Graph 7 describes the pool cover in Parlin Creek. Large woody debris is the dominant pool cover type followed by small woody debris.

Table 6 summarizes the dominant substrate by habitat type. Graph 8 depicts the dominant substrate observed in pool tail-outs. Gravel was observed in 80% of pool tail-outs while small Cobble was observed in 12% of pool tail-outs.

The mean percent canopy density for the surveyed length of Parlin Creek was 91%. The mean percentages of hardwood and coniferous trees were 14% and 86%, respectively. Nine percent of the canopy was open. Graph 9 describes the mean percent canopy in Parlin Creek.

For the stream reach surveyed, the mean percent right bank vegetated was 91%. The mean percent left bank vegetated was 93%. The dominant elements composing the structure of the stream banks consisted of sand/silt/clay, 83%, and bedrock, 17% (Graph 10). Coniferous trees were the dominant vegetation type observed in 93% of the units surveyed. Additionally, 6% of the units surveyed had hardwood trees as the dominant vegetation type, (Graph 11).

DISCUSSION

Parlin Creek is a F4 channel type for the first 13,286 feet of the stream surveyed (Reach 1) and a B4 channel type for the remaining 3,474 feet of the stream surveyed (Reach 2). The suitability of F4 and B4 channel types for fish habitat improvement structures is as follows: F4 channels are good for bank-placed boulders; fair for plunge weirs, single and opposing wing-deflectors, channel constrictors, and log cover; and poor for boulder clusters. B4 channels are excellent for low-stage plunge weirs, boulder clusters, bank placed boulders, single and opposing wing-deflectors, and log cover.

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The water temperatures recorded on the survey days 6/28/2006 to 7/12/2006, ranged from 55 to 62 degrees Fahrenheit. Air temperatures ranged from 56 to 72 degrees Fahrenheit. To make any further conclusions, temperatures would need to be monitored throughout the warm summer months, and more extensive biological sampling would need to be conducted.

Flatwater habitat types comprised 58% of the total length of this survey, riffles 18%, and pools 24%. The pools are relatively deep, with 64 of the 89 (72) pools having a maximum residual depth greater than 2 feet. In general, pool enhancement projects are considered when primary pools comprise less than 40% of the length of total stream habitat. In first and second order streams, a primary pool is defined to have a maximum residual depth of at least two feet, occupy at least half the width of the low flow channel, and be as long as the low flow channel width. Installing structures that will increase or deepen pool habitat is recommended for locations where their installation will not be threatened by high stream energy, or where their installation will not conflict with the modification of the numerous log debris accumulations (LDA's) in the stream.

Sixty-two of the 89 pool tail-outs measured had embeddedness ratings of 1 or 2. Twenty of the pool tail-outs had embeddedness ratings of 3 or 4. Seven of the pool tail-outs had a rating of 5, which is considered unsuitable for spawning. Cobble embeddedness measured to be 25% or less, a rating of 1, is considered to indicate good quality spawning substrate for salmon and steelhead. Sediment sources in Parlin Creek should be mapped and rated according to their potential sediment yields, and control measures should be taken.

Eighty-one of the 88 pool tail-outs measured had gravel or small cobble as the dominant substrate. This is generally considered good for spawning salmonids.

The mean shelter rating for pools was 68. The shelter rating in the flatwater habitats was 38. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by large woody debris in Parlin Creek. Large woody debris is the dominant cover type in pools followed by small woody debris. Log and root wad cover structures in the pool and flatwater habitats would enhance both summer and winter salmonid habitat. Log cover structure provides rearing fry with protection from predation, rest from water velocity, and also divides territorial units to reduce density related competition.

The mean percent canopy density for the stream was 91%. Reach 1 had a canopy density of 90%, Reach 2 had a canopy density of 94%. In general, revegetation projects are considered when canopy density is less than 80%.

The percentage of right and left bank covered with vegetation was HIGH at 91% and 93%, respectively. In areas of stream bank erosion or where bank vegetation is sparse, planting endemic species of coniferous and hardwood trees, in conjunction with bank stabilization, is recommended.

RECOMMENDATIONS

- 1) Parlin Creek should be managed as an anadromous, natural production stream.

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- 2) The limited water temperature data available suggest that maximum temperatures are within the acceptable range for juvenile salmonids. To establish more complete and meaningful temperature regime information, 24-hour monitoring during the July and August temperature extreme period should be performed for 3 to 5 years.
- 3) Where feasible, design and engineer pool enhancement structures to increase the number of pools. This must be done where the banks are stable or in conjunction with stream bank armor to prevent erosion.
- 4) Increase woody cover in the pools and flatwater habitat units. Most of the existing cover in the pools is from . Adding high quality complexity with woody cover in the pools is desirable.
- 5) Inventory and map sources of stream bank erosion and prioritize them according to present and potential sediment yield. Identified sites should then be treated to reduce the amount of fine sediments entering the stream.
- 6) Active and potential sediment sources related to the road system need to be identified, mapped, and treated according to their potential for sediment yield to the stream and its tributaries.
- 7) There are several log debris accumulations present on Sample Creek that are retaining large quantities of fine sediment. The modification of these debris accumulations is desirable, but must be done carefully, over time, to avoid excessive sediment loading in downstream reaches.

COMMENTS AND LANDMARKS

The following landmarks and possible problem sites were noted. All distances are approximate and taken from the beginning of the survey reach.

Position (ft):	Habitat unit #:	Comments:
0'	0001.00	Start of survey 50 feet from confluence with South Fork Noyo River
161'	0003.00	Bridge 01 spans channel.
596'	0011.00	Old dam. Multiple coho juveniles observed.
1057'	0019.00	Bridge 02 spans the channel.
2918'	0044.00	Trail access on left bank.
3100'	0048.00	Left bank landslide. Large debris accumulation (LDA) 01 and LDA 02.
4342'	0065.00	Tributary enters on right bank.

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4561'	0068.00	LDA 03.
5522'	0082.00	Coho juveniles observed.
5609'	0084.00	Tributary enters on the left bank.
6217'	0094.00	LDA 04.
9022'	0133.00	Tributary enters on the right bank.
9057'	0134.00	LDA 05.
9383'	0137.00	Old Humboldt crossing.
11129'	0149.00	Old trestle bridge. Erosion site on left bank measures 20' long x 15' wide x 3' high.
11484'	0151.00	Old trestle on right bank.
12026'	0157.00	Tributary enters on right bank.
13010'	0171.00	LDA 06.
13232'	0174.00	Trestle along right bank.
13286'	0175.00	Channel changes from an F4 to a B4. Trestle continues along right bank.
14053'	0183.00	Coho juveniles observed. LDA 07 and LDA 08.
14571'	0188.00	Old trestle in channel.
14587'	0189.00	Right bank erosion.
14642'	0190.00	Steelhead juveniles observed. LDA 09. There is much stored sediment above downed log.
15114'	0192.00	Right bank erosion site measures 20' long x 16' high x 5' deep. LDA 10 had 5' plunge that may be a possible barrier to salmonids.
15378'	0197.00	Trestle crosses channel.
15626'	0199.00	Tributary enters on the right bank.
16423'	0207.00	Downed tree in channel. Erosion on both banks.

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16585' 0208.00 Right bank landslide measures 25' x 15' x 15'. LDA 11 is a possible barrier to salmonids.

16760' 210.00 End of survey. No fish observed over the last 20 habitat units.

REFERENCES

Flosi, G., Downie, S., Hopelain, J., Bird, M., Coey, R., and Collins, B. 1998. *California Salmonid Stream Habitat Restoration Manual*, 3rd edition. California Department of Fish and Game, Sacramento, California.

McCain, M., D. Fuller, L. Decker and K. Overton. 1990. Stream habitat classification and inventory procedures for northern California. FHC Currents. No.1. U.S. Department of Agriculture. Forest Service, Pacific Southwest Region.

Rosgen, D.L., 1994. A Classification of Natural Rivers. *Catena*, Vol 22: 169-199, Elsevier Science, B. V. Amsterdam.

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LEVEL III and LEVEL IV HABITAT TYPES

RIFFLE

Low Gradient Riffle	(LGR)	[1.1]	{ 1 }
High Gradient Riffle	(HGR)	[1.2]	{ 2 }

CASCADE

Cascade	(CAS)	[2.1]	{ 3 }
Bedrock Sheet	(BRS)	[2.2]	{24}

FLATWATER

Pocket Water	(POW)	[3.1]	{21}
Glide	(GLD)	[3.2]	{14}
Run	(RUN)	[3.3]	{15}
Step Run	(SRN)	[3.4]	{16}
Edgewater	(EDW)	[3.5]	{18}

MAIN CHANNEL POOLS

Trench Pool	(TRP)	[4.1]	{ 8 }
Mid-Channel Pool	(MCP)	[4.2]	{17}
Channel Confluence Pool	(CCP)	[4.3]	{19}
Step Pool	(STP)	[4.4]	{23}

SCOUR POOLS

Corner Pool	(CRP)	[5.1]	{22}
Lateral Scour Pool - Log Enhanced	(LSL)	[5.2]	{10}
Lateral Scour Pool - Root Wad Enhanced	(LSR)	[5.3]	{11}
Lateral Scour Pool - Bedrock Formed	(LSBk)	[5.4]	{12}
Lateral Scour Pool - Boulder Formed	(LSBo)	[5.5]	{20}
Plunge Pool	(PLP)	[5.6]	{ 9 }

BACKWATER POOLS

Secondary Channel Pool	(SCP)	[6.1]	{ 4 }
Backwater Pool - Boulder Formed	(BPB)	[6.2]	{ 5 }
Backwater Pool - Root Wad Formed	(BPR)	[6.3]	{ 6 }
Backwater Pool - Log Formed	(BPL)	[6.4]	{ 7 }
Dammed Pool	(DPL)	[6.5]	{13}

ADDITIONAL UNIT DESIGNATIONS

Dry	(DRY)	[7.0]	
Culvert	(CUL)	[8.0]	
Not Surveyed	(NS)	[9.0]	
Not Surveyed due to a marsh	(MAR)	[9.1]	

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Table 1 - Summary of Riffle, Flatwater, and Pool Habitat

Stream Name: Parlin Creek **LLID:** 1236581393696 **Drainage:** Noyo River

Survey Dates: 6/28/2006 to 7/12/2006

Confluence Location: Quad: NOYO HILL **Legal Description:** T17NR16WS04 **Latitude:** 39:22:11.0N **Longitude:** 123:39:29.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating
70	6	FLATWATER	33.3	140	9777	58.3	12.8	0.4	1.2	1143	80018	451	31536		38
89	89	POOL	42.4	45	4010	23.9	14.2	1.1	2.5	640	56977	982	87433	780	68
51	5	RIFFLE	24.3	58	2973	17.7	8.8	0.3	0.7	463	23597	114	5838		31
Total Units	Total Units Fully Measured				Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)		
210	100				16760						160593		124807		

Table 2 - Summary of Habitat Types and Measured

Stream Name: Parlin Creek

LLID: 1236581393696

Drainage: Noyo River

Survey Dates: 6/28/2006 to 7/12/2006

Confluence Location: Quad: NOYO HILL

Legal Description: T17NR16WS04

Latitude: 39:22:11.0N

Longitude: 123:39:29.0W

Habitat Units Canopy	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating	Mean (%)
	51	LGR	24.3	58	2973	17.7	9.0	0.3	1.4	463	23597	114	5838		31	90
	17	RUN	8.1	69	1169	7.0	8.0	0.6	1.5	542	9206	353	5998		40	87
	53	SRN	25.2	162	8608	51.4	15.0	0.3	1.4	1444	76528	499	26467		38	91
	2	TRP	1.0	40	79	0.5	8.0	1.9	3.6	325	649	760	1520	644	95	86
	64	MCP	30.5	42	2699	16.1	14.0	1.1	3.9	614	39316	900	57597	710	72	92
	2	CCP	1.0	34	68	0.4	16.0	1.4	3.3	533	1067	819	1638	712	43	87
	2	STP	1.0	77	154	0.9	16.0	1.5	3.3	1143	2286	1883	3766	1426	23	91
	3	LSL	1.4	39	116	0.7	12.0	1.0	2.6	446	1338	509	1527	411	120	91
	13	LSBk	6.2	61	797	4.8	14.0	1.3	4.4	829	10778	1479	19224	1195	35	92
	3	PLP	1.4	32	97	0.6	17.0	1.0	3.4	515	1544	720	2160	556	120	91
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)		Total Volume (cu.ft.)				
210	100				16760					166308		125736				

Table 3 - Summary of Pools

Stream Name: Parlin Creek **LLID:** 1236581393696 **Drainage:** Noyo River
Survey Dates: 6/28/2006 to 7/12/2006
Confluence Location: Quad: NOYO HILL **Legal Description:** T17NR16WS04 **Latitude:** 39:22:11.0N **Longitude:** 123:39:29.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Residual Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Residual Pool Vol (cu.ft.)	Estimated Total Resid. Vol (cu.ft.)	Mean Shelter Rating
70	70	MAIN	79	43	3000	75	14.3	1.1	619	43318	728	50993	70
19	19	SCOUR	21	53	1010	25	14.0	1.2	719	13660	970	18432	62
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)		Total Volume (cu.ft.)	
89	89				4010					56977		69425	

Table 4 - Summary of Maximum Residual Pool Depths By

Stream Name: Parlin Creek

LLID: 1236581393696

Drainage: Noyo River

Survey Dates: 6/28/2006 to 7/12/2006

Confluence Location: Quad: NOYO HILL

Legal Description: T17NR16WS04

Latitude: 39:22:11.0N

Longitude: 123:39:29.0W

Habitat Units	Habitat Type	Habitat Occurrence (%)	< 1 Foot Maximum Residual Depth	< 1 Foot Percent Occurrence	1 < 2 Feet Maximum Residual Depth	1 < 2 Feet Percent Occurrence	2 < 3 Feet Maximum Residual Depth	2 < 3 Feet Percent Occurrence	3 < 4 Feet Maximum Residual Depth	3 < 4 Feet Percent Occurrence	>= 4 Feet Maximum Residual Depth	>= 4 Feet Percent Occurrence
64	MCP	72	0	0	21	33	30	47	13	20	0	0
13	LSBk	15	0	0	2	15	5	38	5	38	1	8
3	PLP	3	0	0	1	33	1	33	1	33	0	0
2	TRP	2	0	0	0	0	0	0	2	100	0	0
2	STP	2	0	0	0	0	1	50	1	50	0	0
2	CCP	2	0	0	0	0	1	50	1	50	0	0
3	LSL	3	0	0	1	33	2	67	0	0	0	0
			Total	Total < 1 Foot	Total	Total 1 < 2 Feet	Total	Total 2 < 3 Feet	Total	Total 3 < 4 Feet	Total	Total >=
4 Feet Occurrence			< 1 Foot	% Occurrence	1 < 2 Feet	% Occurrence	2 < 3 Feet	% Occurrence	3 < 4 Feet	% Occurrence	>= 4 Feet	%
Total Units			Max Resid. Depth		Max Resid. Depth		Max Resid. Depth		Max Resid. Depth		Max Resid. Depth	
89			0	0	25	28	40	45	23	26	1	1
Mean Maximum Residual Pool Depth (ft.):			2									

Table 5 - Summary of Mean Percent Cover By Habitat

Stream Name: Parlin Creek

LLID: 1236581393696

Drainage: Noyo River

Survey Dates: 6/28/2006 to 7/12/2006

Confluence Location: Quad: NOYO HILL

Legal Description: T17NR16WS04

Latitude: 39:22:11.0N

Longitude: 123:39:29.0W

Habitat Units	Units Fully Measured	Habitat Type	Mean % Undercut Banks	Mean % SWD	Mean % LWD	Mean % Root Mass	Mean % Terr. Vegetation	Mean % Aquatic Vegetation	Mean % White Water	Mean % Boulders	Mean % Bedrock Ledges
51	5	LGR	16	33	35	0	16	0	0	0	0
17	2	RUN	45	10	30	0	15	0	0	0	0
53	4	SRN	10	40	30	0	20	0	0	0	0
2	2	TRP	0	10	40	0	0	0	10	15	25
64	63	MCP	10	24	36	9	4	0	0	1	17
2	2	CCP	0	35	20	15	15	0	0	0	15
2	2	STP	0	0	10	0	0	0	5	0	85
3	3	LSL	12	12	35	38	3	0	0	0	0
13	13	LSBk	24	15	3	1	1	0	0	5	43
3	3	PLP	0	20	37	20	0	0	7	7	10

Table 6 - Summary of Dominant Substrates By Habitat

Stream Name: Parlin Creek

LLID: 1236581393696

Drainage: Noyo River

Survey Dates: 6/28/2006 to 7/12/2006

Confluence Location: Quad: NOYO HILL

Legal Description: T17NR16WS04

Latitude: 39:22:11.0N

Longitude: 123:39:29.0W

Habitat Units	Units Fully Measured	Habitat Type	% Total Silt/Clay Dominant	% Total Sand Dominant	% Total Gravel Dominant	% Total Small Cobble Dominant	% Total Large Cobble Dominant	% Total Boulder Dominant	% Total Bedrock Dominant
51	5	LGR	0	0	100	0	0	0	0
17	2	RUN	0	0	100	0	0	0	0
53	4	SRN	0	0	100	0	0	0	0
2	2	TRP	0	0	50	0	0	0	50
64	64	MCP	0	25	47	17	6	0	5
2	2	CCP	0	50	50	0	0	0	0
2	2	STP	0	0	0	0	0	0	100
3	3	LSL	0	33	67	0	0	0	0
13	13	LSBk	0	8	38	23	15	0	15
3	3	PLP	0	0	100	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire

Stream Name: Parlin Creek

LLID: 1236581393696

Drainage: Noyo River

Survey Dates: 6/28/2006 to 7/12/2006

Confluence Location: Quad: NOYO HILL

Legal Description: T17NR16WS04

Latitude: 39:22:11.0N

Longitude: 123:39:29.0W

Habitat Units	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
91	87	14	0	91	93

Note: Mean percent conifer and hardwood for the entire reach are means of canopy components from units with canopy values greater than zero.

Open units represent habitat units with zero canopy cover.

Table 8 - Fish Habitat Inventory Data Summary

Stream Name: Parlin Creek LLD: 1236581393696 Drainage: Noyo River
 Survey Dates: 6/28/2006 to 7/12/2006 Survey Length (ft.): 16760 Main Channel (ft.): 16760 Side Channel (ft.): 0
 Confluence Location: Quad: NOYO HILL Legal Description: T17NR16WS04 Latitude: 39:22:11.0N Longitude: 123:39:29.0W

STREAM REACH: 1

Channel Type: F4	Canopy Density (%): 90.1	Pools by Stream Length (%): 27.2
Reach Length (ft.): 13286	Coniferous Component (%): 86.8	Pool Frequency (%): 43.1
Riffle/Flatwater Mean Width (ft.): 12.2	Hardwood Component (%): 13.2	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Coniferous Trees	< 2 Feet Deep: 20.0
Range (ft.): 17 to 28	Vegetative Cover (%): 92.1	2 to 2.9 Feet Deep: 49.3
Mean (ft.): 22.6363636363636	Dominant Shelter: Large Woody Debris	3 to 3.9 Feet Deep: 29.3
Std. Dev.: 3.00782136674739	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 1.3
Base Flow (cfs): 2.1	Occurrence of LWD (%): 27.7	Mean Max Residual Pool Depth (ft.): 2.60
Water (F): 56 - 62 Air (F): 61 - 72	LWD per 100 ft.:	Mean Pool Shelter Rating: 64
Dry Channel (ft.): 0	Riffles: 1	
	Pools: 3	
	Flat: 2	
Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 1.4 Gravel: 77.0 Sm Cobble: 14.9 Lg Cobble: 0.0 Boulder: 0.0 Bedrock: 6.8		
Embeddedness Values (%): 1. 44.0 2. 33.3 3. 12.0 4. 2.7 5. 8.0		

STREAM REACH: 2

Channel Type: B4	Canopy Density (%): 94.1	Pools by Stream Length (%): 11.3
Reach Length (ft.): 3474	Coniferous Component (%): 85.2	Pool Frequency (%): 38.9
Riffle/Flatwater Mean Width (ft.): 5.5	Hardwood Component (%): 14.8	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Coniferous Trees	< 2 Feet Deep: 71.4
Range (ft.): 9 to 24	Vegetative Cover (%): 91.9	2 to 2.9 Feet Deep: 21.4
Mean (ft.): 15.9230769230769	Dominant Shelter: Large Woody Debris	3 to 3.9 Feet Deep: 7.1
Std. Dev.: 5.92856888246083	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 0.0
Base Flow (cfs): 2.1	Occurrence of LWD (%): 44.1	Mean Max Residual Pool Depth (ft.): 1.85
Water (F): 55 - 59 Air (F): 56 - 65	LWD per 100 ft.:	Mean Pool Shelter Rating: 92
Dry Channel (ft.): 0	Riffles: 2	
	Pools: 7	
	Flat: 2	
Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 7.1 Gravel: 92.9 Sm Cobble: 0.0 Lg Cobble: 0.0 Boulder: 0.0 Bedrock: 0.0		
Embeddedness Values (%): 1. 7.1 2. 21.4 3. 21.4 4. 42.9 5. 7.1		

Table 9 -Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Parlin Creek **LLID:** 1236581393696 **Drainage:** Noyo River
Survey Dates: 6/28/2006 to 7/12/2006
Confluence Location: Quad: NOYO HILL **Legal Description:** T17NR16WS04 **Latitude:** 39:22:11.0N **Longitude:** 123:39:29.0W

Mean Percentage of Dominant Stream Bank

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	16	17	16.7
Boulder	0	0	0.0
Cobble/Gravel	1	1	1.0
Sand/Silt/Clay	82	82	82.8

Mean Percentage of Dominant Stream Bank

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Grass	0	1	0.5
Brush	3	1	2.0
Hardwood Trees	8	3	5.6
Coniferous Trees	89	95	92.9
No Vegetation	0	0	0.0

Total Stream Cobble Embeddedness 2

Table 10 - Mean Percent of Shelter Cover Types For Entire

Stream Name: Parlin Creek

LLID: 1236581393696

Drainage: Noyo River

Survey Dates: 6/28/2006 to 7/12/2006

Confluence Location: Quad: NOYO HILL

Legal Description: T17NR16WS04

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	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	16	22	11
SMALL WOODY DEBRIS (%)	33	30	22
LARGE WOODY DEBRIS (%)	35	30	30
ROOT MASS (%)	0	0	9
TERRESTRIAL VEGETATION (%)	16	18	4
AQUATIC VEGETATION (%)	0	0	0
WHITEWATER (%)	0	0	1
BOULDERS (%)	0	0	2
BEDROCK LEDGES (%)	0	0	21

Parlin Creek





